



# Stairfoot Quarry Restoration

## Environmental Statement – Volume 2

### Chapter 6.0 - Noise

Prepared for



Green Earth (Stairfoot) Limited.

October 2025  
3263-01-ES-06



# Document Control

Revision	Date	Prepared By	Reviewed / Approved By
3263-01-ES-06	October 2025	D Kettlewell	

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## CONTENTS

<b>6.0</b>	<b>NOISE</b> .....	<b>1</b>
6.1	Introduction .....	1
6.2	Proposed Development .....	1
6.3	Methodology and Scope of Assessment .....	3
6.4	Baseline .....	21
6.5	Assessment of Effects .....	25
6.6	Incorporated Mitigation .....	32
6.7	Cumulative Effects .....	33
6.8	Additional Mitigation .....	34
6.9	Residual Effects and Conclusions .....	34

## TABLES

**Table 6.1: Noise Exposure Hierarchy**

**Table 6.2: Guidance on Sound Insulation and Noise Reduction for Buildings**

**Table 6.3: Magnitude of Change – Road Traffic Noise- Short Term**

**Table 6.4: Magnitude of Change – Road Traffic Noise- Long Term**

**Table 6.5: Impact Magnitude Scale - Future Noise against Existing (Operational Phase)  
in accordance with PPG criteria**

**Table 6.6: Impact Magnitude Category – Temporary Noise Activities (i.e. restoration,  
soil stripping and movement for construction of earth mounds)**

**Table 6.7: Magnitude of Change – Road Traffic Noise- Short Term**

**Table 6.8: Magnitude of Change – Road Traffic Noise- Long Term**

**Table 6.9: Receptor Sensitivity**

**Table 6.11: Existing Background Sound Levels at Monitoring Position (Weekday)**

**Table 6.12: Predicted highest likely noise contribution from waste disposal,  
restoration and composting site operations at NSR**

**Table 6.16: Residual Impact at Nearest Sensitive Receptor after Mitigation Measures**

## FIGURES

**Figure 6.1 – Baseline Sound Monitoring Positions, Site Location, NSR & NSER  
Positions**

**Figure 6.2 – Proposed Acoustic Screening Along Northern Boundary of Site**



## **APPENDICES**

**Appendix 6-1: Basic Acoustic Terminology**

**Appendix 6-2: Noise Survey Details**

**Appendix 6-3: Baseline Sound Survey Results**

**Appendix 6-4: Assumed Plant Noise Levels**

**Appendix 6-5: Noise Mapping Results**



## 6.0 NOISE

### 6.1 Introduction

6.1.1 This chapter assesses the impact of the Proposed Development with regard to noise. It describes the methods used to assess the impacts, the baseline conditions that currently exist at the site and the potentially affected nearest sensitive receptors ('NSR'), nearest ecological receptors ('NSER') and nearest recreational receptors ('NRR'), the possible direct and indirect impacts arising from the Proposed Development and the mitigation measures that could be implemented to reduce noise impact from the proposal.

6.1.2 The assessment includes the consideration of:

- information on typical existing sound climate;
- information on the noise levels from site noise sources;
- outline of the likely evolution of the future baseline sound levels;
- information and predictions on the noise impact from infilling of voids and restoration works;
- information on the noise impact associated with the movement of HGVs;
- noise mitigation measures to meet 'best practicable means' ('BPM').

6.1.3 In terms of effects from vibration, as there are no activities proposed that involves any operation of any significant vibratory plant and vibration from site operations would not be perceptible at NSR, vibration has been scoped out of the operational assessment.

6.1.4 **Appendix 6.1** provides details of technical terms within the chapter, and a chart showing typical everyday noise levels to assist in understanding the subjective level of noise in terms of decibels. For vibration there is also a chart showing typical levels for different activities.

### 6.2 Proposed Development

6.2.1 This Environmental Statement has been prepared by Axis, on behalf of Green Earth (Stairfoot) Ltd (hereafter referred to as 'the Applicant'), in support of a planning application for the restoration of Yew Tree Quarry ('the Site'). The Proposed



- Development would ensure the comprehensive restoration of the Quarry delivering biodiversity benefits and removing health and safety risks associated with the large waterbody.
- 6.2.2 The Applicant wishes to re-engineer the landform of the Application Site through the importation of non-hazardous soil materials and then introduce a new restoration scheme. Material that would be imported would comprise excavated non-hazardous soils from development sites in the local area. It is estimated that circa 400,000m<sup>3</sup> of non-hazardous soil materials would be imported over a period of 111 weeks. This would equate to circa 100 HGV tippers on average per day. The distance from which material would be imported from would be controlled by market forces as the cost of transporting soils by road makes it unviable to do so over long distances therefore the material would be generated by development projects within the area.
- 6.2.3 A full description of the Site is provided in Chapter 3.0. The location of the Proposed Development (the Site) is shown on **Figure 1.1**.
- 6.2.4 The Site would receive material 5 days per week, Monday to Friday 07:30 – 16:30. Saturday operations would be limited from 08:00 – 13:00, there would be no vehicle deliveries during this time.
- 6.2.5 A sound survey has been carried out in the vicinity of the Proposed Development to determine existing representative background and residual sound levels. The aim of the sound survey was to:
- identify the existing baseline sound levels for use as a reference for background and residual sound levels in the assessment of impacts related to the operation of the Proposed Development;
  - enable the assessment baseline to be established and understand the effects of existing developments on the future baseline; and
  - characterise the nearest noise sensitive receptors (NSR) or noise sensitive sites;
- 6.2.6 The methodology and approach to the sound survey and assessment included the following:
- establishing the nearest NSR, NSER and NRR;



- evaluation of present and assessment background and ambient sound levels;
- evaluation of noise sources from the Proposed Development in terms of typical operating levels;
- assessment of specific noise sources in relation to appropriate guidance and standards (e.g. Planning Policy Guidance on Minerals, BS5228:2009+A1:2014); and
- identification of incorporated mitigation measures and any additional noise control necessary where noise generated from the Proposed Development has been identified as exceeding noise limits.

### ***Competence***

6.2.7 The author of this assessment has over 40 years' experience in the field of industrial and environmental acoustics with a Masters' Degree in Acoustics and is a Member of the Institute of Acoustics, Member of the Association of Noise Consultants, Member of the Academy of Experts and an Incorporated Engineer.

## **6.3 Methodology and Scope of Assessment**

### ***Legislation and Guidance***

#### ***General***

6.3.1 To establish the impact of the Proposed Development in respect of noise on existing or proposed residential receptors it is necessary to consider the relevant noise guidance, standards and policy for a quarry restoration development. The following section examines the guidance and establishes the methodology to be adopted for assessing noise impacts.

6.3.2 Information used in this assessment has been obtained from the following sources:

- Ordnance Survey maps of the local area;
- phased workings of the Proposed Development;



- National Planning Policy Framework – December 2024<sup>1</sup>;
- Noise Policy Statement for England (NPSE) – March 2010<sup>2</sup>;
- National Planning Practice Guidance (NPPG) July 2019<sup>3</sup>;
- BS4142: 2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'<sup>4</sup>;
- BS8233: 2014<sup>5</sup>;
- BS5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites'<sup>6</sup>;
- World Health Organisation: 'Guidelines for Community Noise' - April 1999<sup>7</sup>;
- Design Manual for Roads and Bridges, LA 111 'Noise and Vibration'; May 2020<sup>8</sup>
- ISO 9613-2: 2024 Acoustics – Attenuation of Sound During Propagation Outdoors<sup>9</sup>;
- IEMA Guidelines for Environmental Noise Impact Assessment (November 2014)<sup>10</sup>;

*National Planning Policy Framework: December 2024 (NPPF)*

- 6.3.3 Chapter 15 of the National Planning Policy Framework (NPPF) relates to 'Conserving and enhancing the natural environment'.
- 6.3.4 Paragraph 187 e) refers directly to noise and states that: *"e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local*

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<sup>1</sup> National Planning Policy Framework – December 2024.

<sup>2</sup> Noise Policy Statement for England (NPSE) – March 2010<sup>2</sup>: Department for Communities and Local Government.

<sup>3</sup> National Planning Practice Guidance – July 2019.

<sup>4</sup> BS4142: 2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'.

<sup>5</sup> BS8233: 2014 'Guidance on sound insulation and noise reduction for buildings'.

<sup>6</sup> BS 5228:2009+A1:2014 Part 1 Noise & Part 2 Vibration 'Code of practice for noise and vibration control on construction and open sites'.

<sup>7</sup> World Health Organisation: April 1999 - Guidelines for Community Noise.

<sup>8</sup> Design Manual for Roads and Bridges, LA 111 Noise and Vibration (formerly HD 213/11).

<sup>9</sup> ISO9613-2 2024: Acoustics – Attenuation of Sound During Propagation Outdoors.

<sup>10</sup> IEMA Guidelines for Environmental Noise Impact Assessment (November 2014.)



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*environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans.”*

6.3.5 Paragraph 198 also states:

*“Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*

*a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*

*b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and*

*c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.*

*Noise Policy Statement for England (NPSE)*

6.3.6 The Noise Policy Statement for England (NPSE) was published in March 2010. It specifies the following long-term vision in policy aims: *“Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:*

- Avoid significant adverse impacts on health and quality of life;*
- Mitigate and minimise adverse impacts on health and quality of life; and*
- Where possible, contribute to the improvement of health and quality of life.”*

6.3.7 The NPSE introduced three concepts to the assessment of noise, which includes:

NOEL – No Observed Effect Level



This is the level below which no effect can be detected and below which there is no detectable effect on health and quality of life due to noise.

LOAEL – Lowest Observable Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected.

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur.

6.3.8 The above categories are however undefined in terms of noise levels and for the SOAEL the NPSE indicates that the noise level will vary depending upon the noise source, the receptor and the time of day/day of the week, etc. The need for more research is therefore required to establish what may represent an SOAEL. It is acknowledged in the NPSE that not stating specific SOAEL levels provides policy flexibility until there is further evidence and guidance.

6.3.9 The NPSE concludes how the LOAEL and SO AEL relate to the three aims listed in paragraph 6.3.6 above. The initial aim relates to avoiding significant adverse effects on health and quality of life, it then addresses the situation where the noise impact falls between the LOAEL and the SOAEL when:

*“all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development.”*

6.3.10 The final aim envisages pro-active management of noise to improve health and quality of life, again taking into account the guiding principles of sustainable development.

*Planning Practice Guidance (PPG) July 2019*

6.3.11 In October 2014, the Ministry of Housing, Communities & Local Government updated the Planning Practice Guidance (“PPG”) on noise associated with Minerals, which



provides guidance on the planning process. The main section of PPG was also updated in July 2019.

- 6.3.12 The main planning section of PPG includes a table summarising the noise exposure hierarchy, based on the likely average response to noise. Under the heading of ‘perception’ the ‘noticeable and not intrusive’ assessment of noise is defined as *‘noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such there is a perceived change in the quality of life’*. The increasing effect level under these conditions is deemed to be *‘no observed adverse effect’* and no specific measures are required.
- 6.3.13 The PPG includes a table summarising the noise exposure hierarchy, based on the likely average response. **Table 6.1** below provides the perception, example of outcome, effect and action required relative to noise:

**Table 6.1 – Noise Exposure Hierarchy**

Response	Examples of Outcomes	Increasing Effect Level	Action
Not present	No Effect	No Observed Effect (NOEL)	No Specific Measures Required
Present and not intrusive	Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect (NOAEL)	No Specific Measures Required
Lowest Observed Adverse Effect Level (LOAEL)			
Present and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; closing windows for some of the time because of the noise. Potential for non-awakening sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level (SOAEL)			
Present and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. having to keep windows closed most of the time, avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid



Response	Examples of Outcomes	Increasing Effect Level	Action
Present and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Observed Adverse Effect	Prevent

6.3.14 Within PPG there is a section on ‘*Guidance on the planning for mineral extraction in plan making and the application process*’ and under Paragraphs 019 to 021 (Reference ID: 27-019-20140306, 27-020-20140306 and 27-021-20140306) the guidance under ‘Noise emissions’ states:

**“Noise emissions**

*How should minerals operators seek to control noise emissions?*

*Those making mineral development proposals, including those for related similar processes such as aggregates recycling and disposal of construction waste, should carry out a noise impact assessment, which should identify all sources of noise and, for each source, take account of the noise emission, its characteristics, the proposed operating locations, procedures, schedules and duration of work for the life of the operation, and its likely impact on the surrounding neighbourhood.*

*Proposals for the control or mitigation of noise emissions should:*

- *consider the main characteristics of the production process and its environs, including the location of noise-sensitive properties and sensitive environmental sites;*
- *assess the existing acoustic environment around the site of the proposed operations, including background noise levels at nearby noise-sensitive properties;*
- *estimate the likely future noise from the development and its impact on the neighbourhood of the proposed operations;*
- *identify proposals to minimise, mitigate or remove noise emissions at source;*



- *monitor the resulting noise to check compliance with any proposed or imposed conditions.*

*How should mineral planning authorities determine the impact of noise?*

*Mineral planning authorities should take account of the prevailing acoustic environment and in doing so consider whether noise from the proposed operations would:*

- *give rise to a significant adverse effect;*
- *give rise to an adverse effect; and*
- *enable a good standard of amenity to be achieved.*

*In line with the Explanatory Note of the Noise Policy Statement for England, this would include identifying whether the overall effect of the noise exposure would be above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation. As noise is a complex technical issue, it may be appropriate to seek experienced specialist assistance when applying this policy.*

*What are the appropriate noise standards for mineral operators for normal operations?*

*Mineral planning authorities should aim to establish a noise limit, through a planning condition, at the noise-sensitive property that does not exceed the background noise level (LA90,1h) by more than 10dB(A) during normal working hours (0700-1900). Where it will be difficult not to exceed the background level by more than 10dB(A) without imposing unreasonable burdens on the mineral operator, the limit set should be as near that level as practicable. In any event, the total noise from the operations should not exceed 55dB(A) LAeq, 1h (free field). For operations during the evening (1900-2200) the noise limits should not exceed the background noise level (LA90,1h) by more than 10dB(A) and should not exceed 55dB(A) LAeq, 1h (free field). For any operations during the period 22.00 – 07.00 noise limits should be set to reduce to a minimum any adverse impacts, without imposing unreasonable burdens on the*



*mineral operator. In any event the noise limit should not exceed 42dB(A) LAeq,1h (free field) at a noise sensitive property.*

*Where the site noise has a significant tonal element, it may be appropriate to set specific limits to control this aspect. Peak or impulsive noise, which may include some reversing beepers, may also require separate limits that are independent of background noise (eg Lmax in specific octave or third-octave frequency bands – and that should not be allowed to occur regularly at night.)*

*Care should be taken, however, to avoid any of these suggested values being implemented as fixed thresholds as specific circumstances may justify some small variation being allowed.*

*What type of operations may give rise to particularly noisy short-term activities and what noise limits may be appropriate?*

*Activities such as soil-stripping, the construction and removal of baffle mounds, soil storage mounds and spoil heaps, construction of new permanent landforms and aspects of site road construction and maintenance.*

*Increased temporary daytime noise limits of up to 70dB(A) LAeq 1h (free field) for periods of up to 8 weeks in a year at specified noise-sensitive properties should be considered to facilitate essential site preparation and restoration work and construction of baffle mounds where it is clear that this will bring longer-term environmental benefits to the site or its environs.*

*Where work is likely to take longer than 8 weeks, a lower limit over a longer period should be considered. In some wholly exceptional cases, where there is no viable alternative, a higher limit for a very limited period may be appropriate in order to attain the environmental benefits. Within this framework, the 70 dB(A) LAeq 1h (free field) limit referred to above should be regarded as the normal maximum.”*

***BS5228-1:2009+A1:2014 Code of Practice for noise and vibration control on construction and open sites***

- 6.3.15 In the foreword of this standard it states `This British Standard refers to the need for the protection against noise and vibration of persons living and working in the vicinity



of, and those working on, construction and open sites. It recommends procedures for noise and vibration control in respect of construction operations, and aims to assist architects, contractors and site operatives, designers, developers, engineers, local authority environmental health officers and planners.

6.3.16 Under the heading 'Use of this document' it states 'As a code of practice, this part of BS5228 takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure claims of compliance are not misleading.'

6.3.17 This scope of the standard is clarified as follows:

*'This part of BS5228 gives recommendations for basic methods of noise control relating to construction sites, including sites where demolition, remediation, ground treatment or related civil engineering works are being carried out, and open sites where work activities/operations generate significant noise levels, including industry-specific guidance.'*

6.3.18 The guidance gives specific advice in relation to noise control from mineral extraction workings.

6.3.19 In summary, advice provided within the document to minimise noise from these types of site is set out under the following headings:

- a) Site location and layout
- b) Choice of equipment
- c) Maintenance of plant
- d) Site operations
- e) Sequencing of activities
- f) Acoustic screening

***BS4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'***

6.3.20 BS4142: 2014 'Methods for rating and assessing industrial and commercial sound' is based on the measurement of background sound using  $L_{A90}$  noise measurements,



compared to source noise levels measured in  $L_{Aeq}$  units. Once any corrections have been applied for source noise tonality, distinct impulses etc., the difference between these two measurements (i.e. known as the 'rating' level) determines the impact magnitude.

- Typically, the greater the difference, the greater the magnitude of the impact.
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact (although this can be dependent on the context).
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- The lower the rating level is, relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact (although this can be dependent on the context).

6.3.21 In order to establish the rating level, corrections for the noise character need to be taken into consideration. As stated in BS4142 (Ref.: section 9.2 of BS4142: 2014+A1:2019 commentary on noise character) such noise characteristics include tonality, impulsivity and intermittency.

6.3.22 The application of BS4142 is **not appropriate** where there are other standards and guidance specific to the noise source, as stated in section 1.3 of the Standard. PPG mineral extraction guidance is the appropriate guidance as this has operated as a quarry, which is to be restored.

***BS8233: 2014 'Guidance on sound insulation and noise reduction for buildings'***

6.3.23 The British Standard BS8233 provides additional guidance on noise levels within buildings. These are based on the WHO recommendations and the criteria given in BS8233 for unoccupied spaces within residential properties.



6.3.24 The guidance provided in section 7.7 of BS8233 provides recommended internal ambient noise levels for resting, dining and sleeping within residential dwellings.

**Table 6.2** provides detail of the levels given in the standard.

**Table 6.2: Guidance on Sound Insulation and Noise Reduction for Buildings**

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Room	35 dB $L_{Aeq,16hours}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hours}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hours}$	30 dB $L_{Aeq,8hours}$
Typical noise levels for acoustic privacy in shared spaces	Restaurant	40-55dB $L_{Aeq,12hours}$	
Study and work requiring concentration.	Staff/Meeting Room, Training Room Executive Office	35-45dB $L_{Aeq,8hours}$ 35-45dB $L_{Aeq,8hours}$	

6.3.25 This standard would be appropriate to apply to existing or proposed residential development. The Site noise contribution should be within the proposed internal noise levels, which would include the following noise limits:

Living room areas:  $\leq 35dB L_{Aeq,16hours}$  (0700-2300 hours) [equivalent to an external level of approximately  $65dB L_{Aeq,16hours}$  based on typical standard double-glazed units in the closed position and approximately  $50dB L_{Aeq,16hours}$  in the open position].

Offices:  $\leq 35dB L_{Aeq, 8hours}$  [equivalent to an external level of approximately  $65dB L_{Aeq, 8hours}$  based on typical standard double-glazed units in the closed position].

***World Health Organisation (WHO) Guidelines for Community Noise: April 1999***

6.3.26 This document provides further updated information on noise and its effects on the community. Within the document for noise ‘*In Dwellings*’ it states that ‘*To enable casual conversation indoors during daytime, the sound level of interfering noise should not exceed 35dB  $L_{Aeq}$ . To protect the majority of people from being seriously annoyed during the daytime, the outdoor sound level from steady, continuous noise should not exceed 55dB  $L_{Aeq}$  on balconies, terraces and in outdoor living areas. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound level should not exceed 50dB  $L_{Aeq}$ . Where it is practical and feasible, the lower outdoor sound level should be considered the maximum desirable sound level for new development.*’



### **Road Traffic Noise**

6.3.27 The DMRB LA 111 provides guidance on the magnitude of change in terms of road traffic noise. The procedure for assessing noise impacts advises the use of a LA<sub>10</sub> measurement index based on a daytime 18-hour time period (i.e. 0600 to 2400 hours) and night-time period (i.e. 0000-0600 hours).

### **EA – Guidance: Noise and Vibration Management: Environmental Permits (December 2023)**

6.3.28 As stated within the above guidance: *“Environmental permits have conditions that require operators to control pollution – this includes controlling noise and vibration.”*

6.3.29 This guidance covers:

- i) *“how the environment agencies will assess noise from certain industrial processes;*
- ii) *what the law says you must do to manage noise and vibration; and*
- iii) *advice on how to manage noise – in particular, how to carry out a noise impact assessment and what operators should include in a noise management plan.”*

6.3.30 Operators (or permit applicants) must consider the potential noise impact of their site. They may need to carry out noise impact assessments:

- i) At the permit application stage;
- ii) When applying to vary a permit; and
- iii) To comply with specific permit conditions.

6.3.31 The guidance advises on four steps that are required when carrying out a noise impact assessment, these include:

- i) Desktop risk assessment – identification of any audible noise plant or operations, identification of NSR, description and ranking of noise sources in terms of potential off-site impact, description of land between site and NSR.
- ii) Off-site monitoring survey – for new development this would relate to a study of the existing baseline sound conditions.



- iii) Source assessment – noise modelling of plant or operations, and if industrial source, using BS4142 and ISO9613 for prediction.
- iv) Best Available Techniques (BAT) or appropriate measures justification – measures to be adopted to avoid unacceptable noise pollution and demonstrate that BAT or appropriate measures would be introduced to prevent, or where that is not practicable, minimise noise impact.

### **Ecological Receptor Disturbance – Noise Guidance**

6.3.32 The Natural England document 'A review of the effects of noise on Birds' Version 1 was published in 2018<sup>11</sup> states in the introduction:

6.3.33 *"This guidance note describes the nature of noise and explains how it is heard and measured. Variable and unpredictable noises often result in the greatest disturbance effects on birds and methods to make representative measurements of variable noise level are presented and discussed. Noise also has other more subtle and less easily measured effects on birds, including masking important acoustic signals and potentially harmful physiological changes caused by increased stress. The available literature for a wide range of effects of different noise sources on birds has been reviewed and summarised, and a list of references for further reading is provided."*

6.3.34 At section 4.3 the NE guidance states:

*"What are the effects of industrial and construction noise?"*

*A number of assessments of noise effects on waterbirds have been undertaken on the Humber Estuary, including the effects of hydraulic hammer or percussive piling, steam venting and other construction activities (Cutts et al. 2009, IECS 2004, 2008, Wright et al. 2010). General conclusions from these studies are that the potential for bird disturbance increases as the difference between the highest discontinuous noise levels and simultaneous continuous noise levels increases, and that birds are*

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<sup>11</sup> Natural England document 'A review of the effects of noise on Birds' Version 1 was published in 2018 by NE (Allan Drewitt, Emma Hawthorne, Richard Saunders & Sarah Anthony)



*more likely to be disturbed by sudden noises than a wide range of more steady, and predictable, noise levels.”*

6.3.35 In conclusion, the NE guidance states:

*“Caution should be exercised when attempting to define a threshold based on noise levels alone. As described above, other factors such as noise ‘peakiness, including rise time of a noise signal, and the frequency content of the noise source, should also be expected to affect bird behaviour.*

*As with other forms of disturbance, bird response varies with other factors such as degree of habituation to ambient noise levels, flock size and availability of resources such as foraging and roosting habitats. Additionally, Halfwerk et al. (2010) argue that knowledge of the spatial, temporal and spectral overlap between noise and species-specific acoustic behaviour are important for effective noise management. For example, road noise in the same range of frequencies as those of a bird’s vocalizations (generally 2-4 kHz) has a much greater masking effect on the detection of acoustic signals than noises outside this range (Dooling & Popper 2007).*

*For all these reasons it seems clear that generic noise threshold levels are unlikely to offer a suitable approach for assessing the potential effects of noise on birds. A potentially more suitable approach might be the application of a threshold increase in noise levels, either continuous noise or sporadic noise. In the case of sporadic noise, a greater than 3 dBA increase in peak noise might be a useful and sufficiently precautionary rule-of-thumb when considering the likelihood of a significant effect (as described above, a difference of 3 dBA in similar types of noise is just distinguishable to people). Thus, as a general rule, if the noise source is no more than 3dB higher than existing noise levels it is unlikely to be significant, but noting that a 3dB increase in the average noise level could mask a significant increase in impulsive noise. Similarly, if considering the potential effect of chronic noise on breeding birds, the absence of a 3dB increase in the maximum level should not be used to exclude an impact linked to an increase in average baseline levels.”*

6.3.36 In summary, the guidance would indicate the following noise level thresholds to be appropriate:



- a) Where  $L_{Amax}$  levels are likely to exceed 70dB  $L_{Amax}$ , then mitigation measures should be considered.
- b) Where  $L_{Aeq}$  or  $L_{Amax}$  levels are likely to exceed the existing baseline levels by 3dB, then mitigation measures should be considered.

#### *Consultation*

- 6.3.37 A formal Pre-application Advice Request was submitted to Barnsley Metropolitan Borough Council ('BMBC') in August 2022. A response to the Pre-application Advice Request was received from BMBC, dated 11<sup>th</sup> August 2022.
- 6.3.38 Subsequently, an Environmental Statement (ES) Scoping Report was submitted to BMBC in December 2024. BMBC Highways Development Control provided a formal consultation response to this, dated 20<sup>th</sup> December 2024. A scoping response was received from the Council Environmental Health Officer on 10<sup>th</sup> December 2024 regarding noise conditions.

#### *Level and Significance of Effect*

- 6.3.39 The level of an effect is a function of the sensitivity or importance of the receiver, or receptor, and the scale or magnitude of the impact. In the case of this assessment the level of the effect has been determined by reference to existing guidance and standards that are explained below.
- 6.3.40 The following types of receptors have been identified:
- a) Residents of existing houses adjacent to the Site (NSR) who could experience site operational noise during soil placement and restoration daytime activities.
  - b) Residents of existing houses (NSR) who could experience road traffic noise during daytime periods.
  - c) Ecological (NSER) and recreational receptors (NRR) adjacent to the Site who could experience operational noise during daytime periods.

#### *Operational Noise*



6.3.41 For general site operations we would refer to PPG for noise limits as they are the most relevant and appropriate for the type of activity i.e.

*“Mineral planning authorities should aim to establish a noise limit, through a planning condition, at the noise-sensitive property that does not exceed the background noise level (LA90,1h) by more than 10dB(A) during normal working hours (0700-1900). Where it will be difficult not to exceed the background level by more than 10dB(A) without imposing unreasonable burdens on the mineral operator, the limit set should be as near that level as practicable. In any event, the total noise from the operations should not exceed 55dB(A) LAeq,1h (free field).”*

6.3.42 For temporary operations such as the construction and removal of baffle mounds, soil storage mounds, construction of new permanent landforms, restoration work and aspects of site road construction and maintenance a noise limit of up to 70dB LAeq,1h (free field) for periods of up to 8 weeks in a year would be applicable.

#### **Assessment of Significance**

6.3.43 The two principal criteria to predict the significance of potential noise impacts are:

- magnitude of the impact; and
- sensitivity of the receptors

6.3.44 This assessment combines the above criteria to predict the significance of the noise and impacts of the Proposed Development.

6.3.45 To help understand the effects of noise changes, descriptions of subjective response have been added. **Table 6.3** below shows the proposed impact magnitude scale.

**Table 6.3: Impact Magnitude Scale - Future Noise against Existing (Operational Phase) in accordance with PPG criteria**

Site noise relative to background noise (BG) & absolute limits dB(A) in accordance with PPG criteria	Subjective Response	Impact Magnitude
<10dB(A) above BG and <=55dB(A) Leq <sub>1hr</sub>	Complaint unlikely	Negligible
=>10dB(A) above BG and <=55dB(A) Leq <sub>1hr</sub>	Complaint unlikely	Slight
<=10dB(A) above BG and >55dB(A) Leq <sub>1hr</sub>	Marginal	Moderate
>10dB(A) above BG and >55dB(A) Leq <sub>1hr</sub>	Complaint likely	Substantial to Severe



- 6.3.46 The criteria in **Table 6.3** reflect key benchmarks of human response to changes in noise level and absolute noise limits, which are deemed to be reasonable. Achieving a limit of background +10dB(A) is the guidance aim with an absolute noise level limit at or below 55dB(A) which is deemed to be acceptable in accordance with PPG and is therefore not significant. Exceeding background +10dB(A) and exceeding 55dB(A)  $L_{eq1hr}$  would represent a significant impact.
- 6.3.47 The impact magnitude scale in **Table 6.4** is used in the assessment of operational noise. The impact scale in relation to restoration and maintenance (e.g. construction of earth screening mounds, soil stripping and removal of mounds) activity noise is slightly different due to a temporary noise source and therefore the magnitude of impact is different. **Table 6.4** below shows the impact scale used to assess temporary noise activities.

**Table 6.4: Impact Magnitude Category – Temporary Noise Activities (i.e. restoration, soil stripping and movement for construction of earth mounds)**

Change in Noise Level dB(A)	Subjective Response	Impact Magnitude
Up to 70dB(A) $L_{eq1hr}$ for up to 8 weeks, general operational phase noise <10dB(A) <sup>1</sup> and <55dB(A) $L_{eq1hr}$	Audible, complaint unlikely for short term activity	No significant impact (negligible)
Up to 70dB(A) $L_{eq1hr}$ for up to 8 weeks, general operational phase noise =>10dB(A) <sup>1</sup> and <=55dB(A) $L_{eq1hr}$	Audible, potential for complaint depending on period of activity	Slight
Up to 70dB(A) $L_{eq1hr}$ for up to 8 weeks, general operational phase noise <=10dB(A) <sup>1</sup> and >55dB(A) $L_{eq1hr}$	Annoying, complaint possible	Moderate
Up to 70dB(A) $L_{eq1hr}$ for up to 8 weeks, general operational phase noise >10dB(A) <sup>1</sup> and >55dB(A) $L_{eq1hr}$	Annoying, complaint likely	Substantial to Severe

<sup>1</sup>This refers to the site operational phase noise level relative to and above typical background noise at NSR.

- 6.3.48 To assess the likely impact on NSR from noise due to increased traffic on the local road network associated with the Proposed Development, noise calculations have been undertaken using CRTN methodology and traffic flow information for the Proposed Development.
- 6.3.49 The DMRB LA 111 provides guidance on the magnitude of change in terms of road traffic noise. The procedure for assessing noise impacts advises the use of a  $LA_{10}$  measurement index based on a daytime 18-hour time period (i.e. 0600 to 2400



hours) and night-time period (i.e. 0000-0600 hours). Further assessment of the impact would be required where changes of 1dB(A) or more are expected in the short-term and changes of 3dB(A) in the long term.

### **Road Traffic Noise**

- 6.3.50 In order to assess the likelihood of any impact upon existing residential properties from **on-site** traffic and mobile plant noise, noise calculations have been undertaken using BS5228: 2009+A1:2014 'haul road' methodology and traffic flow information. The use of LA111 (May 2020) methodology is used for the impact of 'off-site' road traffic.
- 6.3.51 DMRB LA 111 defines the short term and long-term scenarios which are considered to represent the situation when a new road opens (short term) and 15 years after a road opens (long term). The magnitude of change criteria is set out in **Table 6.5** for the short-term and **Table 6.6** for the long-term.

**Table 6.5: Magnitude of Change – Road Traffic Noise- Short Term**

Short term magnitude	Short term noise change (dB LA10,18hr or Lnight)
Negligible	Less than 1.0
Minor (Slight)	1.0 to 2.9
Moderate	3.0 to 4.9
Major (Substantial/Severe)	Greater than or equal to 5.0

**Table 6.6: Magnitude of Change – Road Traffic Noise- Long Term**

Long term magnitude	Long term noise change (dB LA10,18hr or Lnight)
Negligible	Less than 3.0
Minor (Slight)	3.0 to 4.9
Moderate	5.0 to 9.9
Major (Substantial/Severe)	Greater than or equal to 10.0

- 6.3.52 In order to determine the significance of an impact, not only must the magnitude of this impact be determined but also the sensitivity of the receptors to the impact. For this assessment, the categories presented in **Table 6.7** have been adopted.

**Table 6.7: Receptor Sensitivity**



Receptor Sensitivity	Type of Receptor
High	Dwellings/residential properties including houses, flats, old people's homes, hospitals, schools, churches, caravans and open spaces/conservation areas.
Moderate	Commercial premises including retails and offices etc.
Low	Industrial premises including warehouses and distribution etc.

6.3.53 Based upon the assessment of impact magnitude and the sensitivity of individual receptors, the matrix shown in **Table 6.8** has been developed in order to provide an indication of the possible level of effect for each predicted noise impact. Given that there are many factors which may affect the level of the effect of an impact, not least, the character of the noise and timescales over which the noise operates, the overall level of effect must be assessed on an individual basis using professional judgement and experience. Therefore, whilst the matrix provides a useful indication of the likely significance it cannot be applied in all situations.

**Table 6.8: Level of Effect Matrix**

Impact Magnitude	Receptor Sensitivity		
	High	Moderate	Low
<b>Severe</b>	Major	Major/Moderate	Moderate/Minor
<b>Substantial</b>	Major/Moderate	Moderate	Minor
<b>Moderate</b>	Moderate	Moderate/Minor	Minor/Neutral
<b>Slight</b>	Minor	Minor/Neutral	Neutral
<b>No significant impact (negligible)</b>	Neutral	Neutral	Neutral

6.3.54 Where a level of effect is defined as Major or Major/Moderate then the effect is likely to be considered significant i.e. an impact that is likely to be a key material factor in the decision-making process.

### **Limitations**

6.3.55 No specific limitations were encountered in the preparation of this assessment chapter.

## **6.4 Baseline**

6.4.1 A baseline background sound survey was undertaken during a weekday and Saturday period in November 2024 and was carried out in accordance with the advice given in BS4142: 2014+A1:2019.



- 6.4.2 The survey involved two fixed monitoring positions in proximity of the NSR and an additional spot roaming measurement position off Wombwell Lane (A633) as indicated in **Figure 1.1** (described in more detail below) and were chosen to be representative of the nearest residential receptors to the Proposed Development and provide broadband data of the existing sound climate at these receptors. Details of the instrumentation used for the survey are detailed in **Appendix 6.2**.
- 6.4.3 The local sound environment is therefore generally formed by noise from local and distant road traffic and birdsong.
- 6.4.4 The survey monitoring equipment was set up and collected by Mr D. R. Kettlewell of Noise & Vibration Consultants Ltd who has over 40 years' experience in the field of environmental and industrial acoustics and noise control.
- 6.4.5 Measurements of background sound were recorded at the monitoring position shown on **Figure 6.1**. Data logging of  $L_{Aeq}$ ,  $L_{A10}$ ,  $L_{A90}$  and  $L_{Amax}$  were recorded over 15-minute intervals.
- 6.4.6 The background sound levels have been analysed for the monitoring period to establish the 'representative' background sound level.
- 6.4.7 The monitoring positions were as follows:
- Position MP1 (Rear of St Pauls Parade) – North of Site*
- 6.4.8 Monitoring position 'MP1' is representative of the NSR to the north of Site, which are located off St Pauls Parade. Noise levels at this location are generally affected by distant road traffic noise. The monitoring position was chosen on land to the rear of properties at the southeastern corner of St Pauls Parade (Receptor R1). Refer to **Figure 6.1** for location.
- Position MP2 (Rear of Albany Close) – South of Site*
- 6.4.9 Monitoring position 'MP2' is representative of the NSR to the south of Site, which are located off Albany Close. Noise levels at this location are generally affected by local and distant road traffic noise. The monitoring position was chosen on land to the rear of the properties adjacent to (Receptor R2). Refer to **Figure 6.1** for location.



- 6.4.10 Although ambient noise levels can vary depending on weather conditions, the purpose of the baseline survey is to monitor sound levels under suitable weather conditions. This then provides a typical and representative indication of ambient conditions.
- 6.4.11 For the purpose of this assessment, it is assumed that the assessment of operational noise from the Proposed Development would be undertaken under appropriate weather conditions and therefore any significant positive or negative vector from wind direction is not representative. The effect of wind speed and direction can also increase background noise levels thereby masking any potential increase in site-specific noise levels. For this reason, it is assumed that typical weather conditions apply and no increase or decrease for the wind vector is required.
- 6.4.12 It is considered that the results are a good indication of typical background sound levels as the survey included the closest residential NSR to the Site. Receptors at greater distance, would be subject to a lower level of impact due to a greater separation distance.

#### ***Existing Background Sound Survey Results***

- 6.4.13 The results of measurements taken at the two fixed monitoring positions and one spot roaming position are presented in **Table 6.9** and detailed measurements are provided in **Appendix 6.3**.

**Table 6.9: Existing Background Sound Levels at Monitoring Position (Weekday & Saturday)**

Monitoring Position	Time Period	LAeq dB	LA10 dB	LA90 dB	LAmx dB	Representative LA90 dB
MP1: Rear of St Pauls Parade	Weekday: 0700-1700 hrs	48	50	46	54-79	<b>46</b>
	Saturday: 0800-1300 hrs	48	50	45	57-73	<b>45</b>
MP2: Rear of Albany Close	Weekday: 0700-1700 hrs	49	51	46	51-74	<b>46</b>
	Saturday: 0800-1300 hrs	50	52	47	57-67	<b>47</b>
MP3: 5m Wombwell Lane	Weekday: 0900-1000 hrs	64	66	58	69-82	<b>58</b>

- 6.4.14 The results of background sound measurements taken at the fixed monitoring positions indicate that representative background sound levels during the weekday and Saturday daytime periods varied between 45dB and 47dB  $L_{A90}$ .
- 6.4.15 Details of the instrumentation used for the survey are detailed in **Appendix 6.2**.
- 6.4.16 The local sound environment is therefore generally formed by noise from local and distant road traffic and birdsong.
- 6.4.17 The noise limit according to PPG for Mineral Workings would be 55dB  $L_{Aeq,1hr}$  or background +10dB whichever is the lower. The measured background sound level indicates that **the limit is therefore 55dB  $L_{Aeq,1hr}$**  at the noise sensitive receptor (NSR) boundary.

### ***Identification of Nearest Sensitive Receptors (NSR)***

#### *Residential Receptors*

- 6.4.18 The site is adjacent to NSR off St Pauls Parade with garden boundaries adjacent to the eastern boundary of the Site (Receptor R1). The location of the dwellings are on elevated land with the quarry void parallel with the Site's eastern boundary and the landform sloping south and down towards the A633. The noise climate is formed by distant road traffic noise.
- 6.4.19 The nearest NSR to the south of the Site are located at circa 340m from the Site boundary (Receptor R2) off Albany Close. The noise climate is formed by local and distant road traffic noise.
- 6.4.20 The nearest NSR to the access of the Site are southeast off Wombwell Lane (R3) at a distance of circa 100m. These properties are immediately off Wombwell Lane and therefore noise levels are dominated by local road traffic.
- 6.4.21 We are not aware of any other future receptors proposed that would be of greater sensitivity than those considered in this assessment.

#### *Nearest Sensitive Ecological Receptors ('NSER')*



6.4.22 According to Preliminary Ecological Appraisal ('PEA') the nearest designated site [i.e. Site of Specific Scientific Interest ('SSSI')] is located 100m south of the Proposed Development Site boundary.

*Nearest Recreational Receptors ('NRR')*

6.4.23 The Trans Pennine Trail (TPT) and Public Footpaths 323 and 324 are all located within or on the boundary of the Site. Refer to **Figure 6.2** showing the location and proposed mitigation measures to re-direct footpaths where required.

## 6.5 Assessment of Effects

6.5.1 The measure that is generally used in noise assessments and is recommended internationally for the description of environmental noise is the equivalent continuous noise level or  $L_{Aeq}$  parameter.

6.5.2 In general, the level of noise in the local environs that arises from a development site will depend on a number of factors. The more significant of which are:

- The sound power levels (SWL's) of the plant or equipment used on site.
- The frequency content and characteristics of the noise source.
- The periods of operation of the plant on site.
- The distance between the source noise and the receiving position.
- The presence or absence of screening effects due to barriers, or ground absorption.
- Any reflection effects due to the facades of buildings etc.

6.5.3 The calculation method used in this study is based upon BS5228-1:2009+A1:2014 noise propagation model, which takes into account source position, frequency content, screening effects, distance and direction in relation to the nearest receptor. For site operational noise we have used CadnaA software for producing noise maps of the highest likely generated noise. The assessment has used empirical field data taken from similar sites to calculate the expected resultant noise contribution at the nearest property boundary locations during daytime operations. The noise model provides predicted noise levels at each of the receptor points listed in **section 6.4.18 to 6.4.23**.



- 6.5.4 An assessment has been undertaken on the following:
- Infilling activities; and
  - Restoration activities.
- 6.5.5 The site activities would involve the use of the following plant and machinery:
- Dozers
  - Roller
  - 8-wheel road tipper HGVs
- 6.5.6 The site noise sources and their associated activities would vary from day to day and would be in use at different stages of the proposed development and for varying durations. The prediction calculations allow for the cumulative effect of all plant in operation and maximum HGVs movements to represent the highest likely noise levels.
- 6.5.7 The assessment of infill and restoration activities is based on plant detailed in **paragraph 6.5.5** above and empirical data on plant noise levels from library data as outlined in **Appendix 6.4**.
- 6.5.8 In order to give an indication of the highest likely noise levels generated by the works, the noise sources are considered at the closest approach. The procedures set out in British Standard, BS5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites', have been used to estimate noise levels at the nearest receptor properties.
- 6.5.9 The unit used to assess construction noise is the Equivalent Continuous Sound Pressure Level,  $L_{Aeq}$ .
- Operational Noise Effects - Infill & Restoration*
- 6.5.10 Infill and restoration material would be imported to the Site for the purpose of Site restoration. The proposed phasing and restoration plans are illustrated on **Figure 3.3**.
- 6.5.11 This would include using the plant detail provided in **paragraph 6.5.5** above.



- 6.5.12 It is anticipated that waste material would be transported to the Site via Tipper HGVs and positioned and compacted using a Dozer and Roller. Based on the data provided within the Transport Assessment it is possible that a 'worst case' maximum of 200 two-way HGVs per weekday and 10 two-way staff vehicles per day.
- 6.5.13 Empirical field data obtained from measurements of associated infill and restoration plant at similar sites in the UK have been used to calculate the expected resultant noise contribution at the nearest property boundary locations during daytime operations. Refer to **Table 6.10** and **Appendix 6.4** for further information.
- 6.5.14 The following table provides an indication of the highest likely noise levels during the infill and restoration activities. This includes the proposed mitigation measures as detailed in **section 6.6**. Refer to **Appendix 6.5** for noise mapping.

**Table 6.10: Predicted highest likely noise contribution from infill and restoration Site operations at NSR (including mitigation measures)**

NSR Position (Refer to Figure 6.2)	Working Phase	Highest Predicted Noise Level L <sub>Aeq,1hr</sub> dB	Background Sound Levels L <sub>A90</sub> [L <sub>Aeq</sub> ] dB	PPG Limits <sup>2</sup> L <sub>Aeq,1hr</sub> dB	Level Difference <sup>1</sup> L <sub>Aeq,1hr</sub> dB	Reference Noise Maps (Appendix 6-5)
R1: St Pauls Parade (north)	1	36-49	45-46 [48]	55	<b>-19 to -6</b>	Map 1
	2	40-48	45-46 [48]	55	<b>-15 to -7</b>	Map 2 to 4
	3	38-47	45-46 [48]	55	<b>-17 to -8</b>	Map 5 to 8
	4	40-54	45-46 [48]	55	<b>-15 to -1</b>	Map 9 to 12
	5	35-52	45-46 [48]	55	<b>-20 to -3</b>	Map 13 to 17
	6	36-44	45-46 [48]	55	<b>-19 to -11</b>	Map 18 to 23
R2: Albany Close (south)	1	39-45	46-47 [49-50]	55	<b>-16 to -10</b>	Map 1
	2	39-45	46-47 [49-50]	55	<b>-16 to -10</b>	Map 2 to 4
	3	39-45	46-47 [49-50]	55	<b>-16 to -10</b>	Map 5 to 8
	4	39-45	46-47 [49-50]	55	<b>-16 to -10</b>	Map 9 to 12
	5	39-45	46-47 [49-50]	55	<b>-16 to -10</b>	Map 13 to 17
	6	39-45	46-47 [49-50]	55	<b>-16 to -10</b>	Map 18 to 23
R3: Wombwell Lane (south)	1	46-50	58 [64]	55	<b>-9 to -5</b>	Map 1
	2	46-51	58 [64]	55	<b>-9 to -5</b>	Map 2 to 4
	3	46-51	58 [64]	55	<b>-9 to -5</b>	Map 5 to 8
	4	46-51	58 [64]	55	<b>-9 to -5</b>	Map 9 to 12
	5	46-51	58 [64]	55	<b>-9 to -5</b>	Map 13 to 17
	6	46-51	58 [64]	55	<b>-9 to -5</b>	Map 18 to 23

<sup>1</sup>Column 6 is level difference between column 3 and column 5.

<sup>2</sup>PPG guidance for mineral workings (aim of background sound levels +10dB or 55dB whichever is the lower).

- 6.5.15 The assessment of impact from infill and restoration Site activities (with mitigation measures) during weekday peak working periods concludes that at all NSR there would be a **negligible** impact magnitude and **neutral** effect during peak periods of



activity and as such these impacts are **not significant** in EIA terms. **Paragraphs 6.6.1 to 6.6.2** provide mitigation measures applying BPM.

6.5.16 There would be some short-term temporary periods where the construction of earth screening mounds, soil stripping, removal of mounds and some restoration work is required. The PPG mineral guidance provides for a higher level of noise during these periods of up to 8 weeks in a year. **Table 6.11** provides an indication of these temporary activities and the phase in which they may occur.

**Table 6.11: Predicted highest likely noise contribution from temporary Site operations at NSR (i.e. earth screening mounds, soil stripping, removal of mounds, restoration work)**

NSR Position (Refer to Figure 6.2)	Working Phase	Highest Predicted Noise Level $L_{Aeq,1hr}$ dB	Background Sound Levels $L_{A90}$ [ $L_{Aeq}$ ] dB	PPG Temporary Limits <sup>2</sup> $L_{Aeq,1hr}$ dB	Level Difference <sup>1</sup> $L_{Aeq,1hr}$ dB	Reference Noise Maps (Appendix 6-5)
R1: St Pauls Parade (north)	4	56	45-46 [48]	70	-14	Map 25
	5	59	45-46 [48]	70	-11	Map 26
	6	56	45-46 [48]	70	-14	Map 27

<sup>1</sup>Column 6 is level difference between column 3 and column 5.

<sup>2</sup>PPG guidance for mineral workings (aim of background sound levels +10dB or 55dB whichever is the lower).

6.5.17 **Table 6.11** provides noise predictions from the Proposed Development during temporary short periods when the mobile plant is shaping the contours at highest/closest proximity to the rear property boundaries off St Pauls Parade (receptor R1). The periods when plant reaches in close proximity to the rear boundaries at R1 may occur between phases 4 to 6 as the infill rises towards its highest datum point. These temporary noise events would be well below the PPG threshold of 70dB  $L_{Aeq,1hr}$  and a **negligible** impact magnitude and **neutral** effect during peak periods of temporary activity (refer to **Table 6.4**) and as such these impacts are **not significant** in EIA terms. **Paragraphs 6.6.1 to 6.6.2** provide mitigation measures applying BPM.

*Impact on NSER (Ecological Receptors) and NRR (Recreational Receptors)*

6.5.18 **Table 6.12** provides noise predictions from the Proposed Development at NSER woodland areas (i.e. Site of Special Scientific Interest 'SSSI') and NRR PROW receptors along local footpaths during weekday peak operating periods.



**Table 6.12: Predicted highest likely noise contribution from infill and restoration Site operations at NSER and NRR (PROW) Receptors during Weekday periods**

Receptor Position	Period (All Phases)	Predicted Sound Pressure Levels <sup>1</sup> L <sub>Aeq1hr</sub> dB	Predicted L <sub>Amax</sub> Levels <sup>1</sup> dB	Typical Ambient L <sub>Aeq</sub> dB	Typical Ambient L <sub>Amax</sub> dB
NSER1: SSSI South of Stairfoot Quarry	Daytime	43-49	48-55	48-50	51-79
NRR1: Footpath 323	Daytime	44-66 <sup>2</sup>	49-72	48-50	51-79
NRR2: Footpath 324	Daytime	43-67 <sup>2</sup>	48-73	48-50	51-79
NRR3: Footpath TPT	Daytime	45-66 <sup>2</sup>	50-72	48-50	51-79
NRR4: Diverted Footpath	Daytime	57-62 <sup>2</sup>	62-67	48-50	51-79

<sup>1</sup>The predicted noise levels are due to the proximity of Access Road into Site and the associated road traffic movements. <sup>2</sup>The footpaths vary in distance from the Site activities and are likely to be peak range levels.

- 6.5.19 During Saturday operating periods between 0800 to 1300 hours there would be no HGV movements and the predicted noise levels along footpaths would significantly drop. For example, typical range of noise levels along footpaths 323 and 324 would drop to 20dB to 50dB L<sub>Aeq,1hr</sub> and during phase 6 typically between 26dB and 46dB L<sub>Aeq,1hr</sub> and where plant is in proximity to footpath 324 the level peaks at around 61dB L<sub>Aeq,1hr</sub> for a short temporary period. Refer to **Appendix 6-5** noise maps 28 to 32.
- 6.5.20 The noise levels at NSER on a Saturday period would typically reduce to a level of between 19dB to 24dB L<sub>Aeq,1hr</sub>. Refer to **Appendix 6-5** noise maps 28 to 32.

#### *Operational Noise Impacts on NSER*

- 6.5.21 The above results show no significant noise generation likely to occur at the NSER with levels predicted to range between 43-49dB L<sub>Aeq,1hr</sub>. Typical ambient noise levels without the Site in operation are 48-50dB L<sub>Aeq,T</sub> and therefore the increase would not reach +3dB L<sub>Aeq</sub> above ambient and L<sub>Amax</sub> would not be greater than 70dB and therefore further mitigation measures are not required and the impact would be **negligible** and **not significant**. During Saturday operating periods, the levels would be reduced much further to a level well below existing ambient sound levels.

#### *Operational Noise Impacts on NRR*

- 6.5.22 The proximity of the PROW relative to the access road into Site results in short-term peak L<sub>Aeq</sub> levels from HGV movements. The L<sub>Aeq</sub> and L<sub>Amax</sub> levels are higher than ambient levels in areas close to the access road along footpaths 323, 324 and TPT



and slightly lower along the diverted footpath proposed as part of the mitigation measures during the Proposed Development activities.

6.5.23 During the operational phase, noise levels would vary at locations along the PROW. Whilst there is no specific guidance on PROW levels, for amenity purposes noise levels up to circa 55dB  $L_{Aeq}$  within garden areas is considered acceptable (and has been used on other restoration schemes).

6.5.24 Whilst this noise level would be exceeded in footpath positions close to the Site Access Road and Site boundary, the extent of any operational noise is relatively short in terms of time and experience as this is a transient event. This would only be relevant to daytime weekday periods and therefore considered less sensitive than a permanent resident. As this is a short-term transitional impact along short sections of footpaths within a large footpath footprint, the effect is deemed to be **not significant**.

6.5.25 In consideration of the above factors, the impact during weekdays is deemed to range between **slight to moderate** and **minor to moderate** effect along the sections of footpath in proximity to the Site boundary and therefore **not significant**. Noise mitigation measures are proposed in respect of providing a footpath diversion and no HGV movements to and from Site on Saturdays to minimise noise together with management controls (refer to **section 6.6**).

6.5.26 During Saturday operating periods, with HGVs not travelling to and from Site, it is anticipated that this would reduce impacts to **slight** and **minor** level of effect at NRR and **not significant**.

#### *Road Traffic Noise*

6.5.27 The former Stairfoot Quarry Complex (the Quarry) is circa 18 hectares of land located approximately 2km from the centre of Barnsley on the eastern edge of the town. The area is largely residential.

6.5.28 The Application Site comprises the former Yew Tree Quarry, which is a circa 4.7ha broadly triangular area within the wider Stairfoot Quarry Complex. The Site is bounded to the north by the rear gardens of properties on St Pauls Parade and to



- the west by an area of woodland. A public right of way (PRoW), Footpath 234, runs to the south from the southeast to the northwest of the Application Site, beyond which is South Quarry and the former Stairfoot Brickworks site. The Trans Pennine Trail runs from east to west between South Quarry and the former Brickworks site.
- 6.5.29 The site has historically been (and continues to be) accessed via a private right of way through the former (now cleared) Stairfoot Brickworks site, which connects to the A633 Wombwell Lane.
- 6.5.30 The operating hours of the restoration works would be 07:30 to 16:30, during weekdays. Although permitted it is unlikely that any imports would occur on Saturdays, and as such it has been assumed for robustness that all deliveries would occur on weekdays. There would be **no HGV** activity on Sundays and Bank Holidays.
- 6.5.31 It is anticipated there would be a single shift per day, with all construction staff arriving at the site in the hour prior to the start of shift at 07:30 and departing in the hour following the end of the working day at 16:30. It is also anticipated that HGV deliveries would be managed so as to be evenly spread throughout the working day, and to avoid highway peak hours where possible.
- 6.5.32 According to the Transport Assessment (TA) the Proposed Development would generate up to 22 two-way HGVs per hour, on average. Such a level of trip generation would not be sustained over a long period of time and would be offset by days which are less intensive.
- 6.5.33 **Table 6.13** provides detail of the noise impact due to the increased traffic flow along the local road network based on a 10-hour weekday operating hours period and peak AM and PM periods rather than an 18-hour assumed by DMRB LA 111 which would dilute the impact). The assessment is based on using the traffic data provided within the TA.

**Table 6.13: Predicted Change in Road Traffic Noise on Local Road Network**

Location	Operating Day	Scenario	'Do nothing' LA <sub>10,T</sub> dB	'Do something' LA <sub>10,T</sub> dB	Change (with development) LA <sub>10,T</sub> dB
<b>Weekday (0700-1700 hours) Link 1: A633 Wombwell Lane (north of Site)</b>					
Wombwell Lane (north of Site)	Weekday	2027 (opening)	69.0	69.3	+0.3
	AM Peak		69.1	69.5	+0.4

Location	Operating Day	Scenario	'Do nothing' LA10,T dB	'Do something' LA10,T dB	Change (with development) LA10,T dB
	PM Peak		68.6	68.8	+0.2
Wombwell Lane (south of Site)	Weekday	2027 (opening)	69.1	69.2	+0.1
	AM Peak		69.1	69.3	+0.2
	PM Peak		68.7	68.8	+0.1

Note: Distance to NSR deemed to be 10m as a notional

6.5.34 Based on a maximum HGV demand for the Proposed Development, the impact shows a **negligible** impact magnitude and **neutral** level of effect and **not significant** in respect of traffic movements on a weekday relative to the nearest local road network and at NSR (refer to **Table 6.5** short-term effects and **Table 6.6** long-term).

## 6.6 Incorporated Mitigation

### *Operational Noise*

6.6.1 In accordance with BS 5228, best practical means would be employed to control the noise generation. In consideration of applying best practical means, the following measures would be proposed:

- Restricting operations to the following operating hours:

HGV Deliveries: 0730-1630 hours Monday to Friday

Including staff arrival/exit: 0700 to 1700 hours Monday to Friday

Saturday: No HGV movements

Site Operations: 0800-1300 hours on Saturdays.

- The northern boundary with properties off St Pauls Parade to have a 2.1m to 2.4m high close-boarded screen along the boundary as indicated on **Figure 6.5**. The screen would have a minimum mass of 10kg/m<sup>2</sup> and all gaps sealed below the screen and between panels, or panels and posts to minimise noise 'break-out'.
- Regular maintenance of plant; and
- Site management.



### *Site Management*

6.6.2 The following measures would assist in minimising radiated noise from site:

- Maintain speed restriction on-site for HGVs by the use of traffic calming measures;
- All mobile plant operating on-site should be designed such that reverse alarm use is minimised.
- Where practicable, the mobile plant should be fitted with broadband noise type alarms (i.e. non `beeper' type).
- Ensure drivers are instructed to minimise engine revving and avoid unnecessary impact noise.
- Use of modern equipment fitted with appropriate exhaust silencers.
- Engines to be switched off when not in use.
- Plant equipment should not have engine covers or hoods removed except for maintenance.
- Access and on-site roads regularly maintained and gradient minimised to avoid high engine revving (where practicable and avoiding noise created by, for example, lorries dropping into potholes and bouncing).
- Introduce a complaints procedure and/or site liaison contact or committee for local residents so that they can be informed of site progress and to enable them to be able to make contact with site.
- The use of modern 'quiet' equipment fitted with appropriate silencers etc.
- Effective planned maintenance in accordance with manufacturers' specifications to avoid the generation of excessive noise due to malfunction and to ensure any malfunction is rectified as soon as possible - repair records can be made available.
- The limitation of simultaneous working of machinery where possible.

## **6.7 Cumulative Effects**

6.7.1 We are not aware of any cumulative sites permitted or proposed to consider and therefore no cumulative impacts would occur.

### *Future Baseline*



6.7.2 The Site has been assessed against the current baseline which includes permitted noise sources in the area around the Proposed Development.

6.7.3 If the Proposed Development was not granted the baseline levels would generally remain as exists, due to the influence of existing ambient noise from local noise sources (i.e. local and distant road traffic noise).

## 6.8 Additional Mitigation

6.8.1 There are no additional mitigation measures required in order to comply with relevant and appropriate noise guidance and standards for the operation phase.

## 6.9 Residual Effects and Conclusions

6.9.1 During the infill and restoration period of the development there would be mobile noise sources in use and noise levels would vary throughout the lifespan of the Proposed Development. The highest noise levels relative to NSR are likely to occur during Phases 4 and 5 when mobile plant is located at a higher land height datum and closest to the northern boundary of the Site.

6.9.2 The introduction of BPM mitigation measures (refer to **sections 6.6.1 to 6.6.2**) has the effect of minimising noise levels at the NSR, NSER and NRR.

6.9.3 It is concluded that the operational noise with the implementation of mitigation measures, using best practical means, is likely to result in an impact magnitude classification of **negligible** at NSR and a **neutral** level of effect.

6.9.4 The impact at NSER is shown to be a **negligible impact** and **not significant**.

6.9.5 The impact at NRR with the proposed mitigation measures, is likely to result in an impact magnitude of between **slight to moderate** and **minor to moderate** effect during weekday operations and **slight impact** and **minor** level of effect on Saturdays along the PROW in proximity to the Site boundary and therefore **not significant**.

6.9.6 The change in noise levels as a result of the traffic associated with the Proposed Development would be **negligible** and as such represents a **neutral** significance on high sensitivity residential receptors. As such the impact is considered **not significant** in EIA terms.



6.9.7 There are no cumulative effects from other proposed or permitted developments to consider.

6.9.8 In summary, **no significant noise effects** have been identified by the noise assessment in relation to the Proposed Development. **Table 6.14** below summarises the predicted effects of the operational and restoration of the Proposed Development.

**Table 6.14: Residual Impact at Nearest Sensitive Receptor after Mitigation Measures**

Source	Nature of Effect	Time Period	Potential Effect	Proposed Mitigation	Residual Effect	Residual Impact Magnitude
Operational Road Traffic noise	Direct & Temporary	Daytime	Neutral	None Required	Neutral	Negligible
Operational Noise <sup>1</sup> (NSR)	Direct & Temporary	Daytime	Neutral	BPM Mitigation	Neutral	Negligible
Operational Noise <sup>2</sup> (NSER)	Direct & Temporary	Daytime	Neutral	BPM Mitigation	Neutral	Negligible
Operational Noise <sup>3</sup> (NRR)	Direct & Temporary	Weekdays (daytime) Saturdays (morning)	Minor to Moderate Minor	Diverted Footpaths No HGVs on Saturdays	Slight to Moderate Slight	Slight to Moderate Slight
Cumulative Effects	Direct & Temporary	Daytime	Neutral	None	Neutral	Negligible

<sup>1</sup>Relative to residential receptors (NSR)

<sup>2</sup>Relative to ecological receptors (NSER)

<sup>3</sup>Relative to recreational receptors (NRR)

### **Conclusions**

6.9.9 Noise levels have been considered and assessed during the infill and restoration phases of the Proposed Development. Relevant and appropriate noise guidance and standards have been used to determine the impact. The assessment has been undertaken to establish the impacts of the Proposed Development, such that any likely noise impact on existing and potential NSR, NSER and NRR is within acceptable limits and no significant impacts are likely to occur.

6.9.10 To establish any likely impact from noise, an assessment of baseline sound levels has been considered by undertaking sound monitoring at the nearest residential receptor areas.



- 6.9.11 In accordance with appropriate standards, best practical means would be employed to control the noise generation during the operational period. Measures include, for example, restriction on operating hours, no HGVs on Saturday's, the use of broadband type noise reversing alarms and management controls of plant maintenance and operation.
- 6.9.12 The assessment shows that with appropriate mitigation measures there would be no significant impacts during the infill and restoration activities of the Proposed Development.

