
CHAPTER 6.0 NOISE

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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 noise sensitive receptors, 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 final extraction, infilling of voids and restoration works;
- information on the noise impact on nearest sensitive receptors (NSRs) associated with the movement of HGVs;
- details of potential cumulative effects where noise from other potential developments may also affect the same NSRs;
- an example of noise mitigation measures to meet 'best practicable means' ("BPM").

6.1.3 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.

Proposed Development

6.1.4 A full description of the Sandown Quarry Site is provided in Chapter 3.0. The location of the Proposed Development (the Site) is shown on Figure 6.1.

6.1.5 It has been assumed that site operations and all vehicle and mobile plant movements would be restricted to the following hours of operation which are between:

- 0700 hours and 1900 hours Mondays to Fridays

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- 0800 hours and 1300 hours Saturdays

6.1.6 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 (NSRs) or noise sensitive sites;

6.1.7 The methodology and approach to the sound survey and assessment included the following:

- establishing the nearest NSRs;
- 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 any noise control necessary where noise generated from the Proposed Development has been identified as exceeding noise limits.

Competence

6.1.8 The author of this assessment has over 35 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.

6.2 Planning Policy

General

6.2.1 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.

6.2.2 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 – July 2021;
- Noise Policy Statement for England (NPSE) – March 2010;
- National Planning Practice Guidance (NPPG) June 2021;
- BS4142: 2014+A1:2019 ‘Methods for rating and assessing industrial and commercial sound’;
- BS 8233: 2014 ‘Guidance on sound insulation and noise reduction for buildings’;
- BS5228-1:2009+A1:2014 ‘Code of practice for noise and vibration control on construction and open sites’;
- World Health Organisation: ‘Guidelines for Community Noise’ - April 1999;
- Department of Transport ‘Calculation of Road Traffic Noise’: 1988;
- Design Manual for Roads and Bridges, LA 111 ‘Noise and Vibration’; May 2020
- Calculation of Road Traffic Noise (CRTN): Department of Transport 1988
- ISO 9613-2: 1996 Acoustics – Attenuation of Sound During Propagation Outdoors; and
- NVC Library data.

Consultation

6.2.3 Walsall Council (the Council) have been formally contacted for an EIA Scoping Opinion and the response from the Council’s Officers have been taken into account. The EHO at the Council was formerly presented with a scope of work which enabled them to agree the assessment methodology and receptor locations and baseline methodology. The Canal & River Trust were also consulted and receptors using the canal towpath have been included in the assessment.

National Planning Policy Framework: July 2021 (NPPF)

6.2.4 Chapter 15 of the National Planning Policy Framework (NPPF) relates to 'Conserving and enhancing the natural environment'.

6.2.5 Paragraph 174 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 environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans;"*

6.2.6 Paragraph 185 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."*

6.2.7 Section 17.0 of the NPPF 'Facilitating the sustainable use of minerals' provides details of the planning policies to be adopted, which includes:

"209. It is essential that there is a sufficient supply of minerals to provide the infrastructure, buildings, energy and goods that the country needs. Since minerals are a finite natural resource, and can only be worked where they are found, best use needs to be made of them to secure their long-term conservation.

210. Planning policies should:

- a) provide for the extraction of mineral resources of local and national importance, but not identify new sites or extensions to existing sites for peat extraction;*

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- b) *so far as practicable, take account of the contribution that substitute or secondary and recycled materials and minerals waste would make to the supply of materials, before considering extraction of primary materials, whilst aiming to source minerals supplies indigenously;*
 - c) *safeguard mineral resources by defining Mineral Safeguarding Areas; and adopt appropriate policies so that known locations of specific minerals resources of local and national importance are not sterilised by non-mineral development where this should be avoided (whilst not creating a presumption that the resources defined will be worked);*
 - d) *set out policies to encourage the prior extraction of minerals, where practical and environmentally feasible, if it is necessary for non-mineral development to take place;*
 - e) *safeguard existing, planned and potential sites for: the bulk transport, handling and processing of minerals; the manufacture of concrete and concrete products; and the handling, processing and distribution of substitute, recycled and secondary aggregate material;*
 - f) *set out criteria or requirements to ensure that permitted and proposed operations do not have unacceptable adverse impacts on the natural and historic environment or human health, taking into account the cumulative effects of multiple impacts from individual sites and/or a number of sites in a locality;*
 - g) *when developing noise limits, recognise that some noisy short-term activities, which may otherwise be regarded as unacceptable, are unavoidable to facilitate minerals extracting; and*
 - h) *ensure that worked land is reclaimed at the earliest opportunity, taking account of aviation safety, and that high quality restoration and aftercare of mineral sites takes place.*

211. When determining planning applications, great weight should be given to the benefits of mineral extraction, including to the economy. In considering proposals for mineral extraction, minerals planning authorities should:

- a. *as far as is practical, provide for the maintenance of landbanks of non-energy minerals from outside National Parks, the Broads, Areas of Outstanding*

Natural Beauty and World Heritage Sites, scheduled monuments and conservation areas;

- b. ensure that there are no unacceptable adverse impacts on the natural and historic environment, human health or aviation safety, and take into account the cumulative effect of multiple impacts from individual sites and/or from a number of sites in a locality;*
- c. ensure that any unavoidable noise, dust and particle emissions and any blasting vibrations are controlled, mitigated or removed at source, and establish appropriate noise limits for extraction in proximity to noise sensitive properties;”*

Noise Policy Statement for England (NPSE)

6.2.8 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.”*

6.2.9 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.

6.2.10 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.

6.2.11 The NPSE concludes how the LOAEL and SOAEL relate to the three aims listed in paragraph 7.2.8 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.”

6.2.12 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) June 2021

6.2.13 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 and consultation and pre-decision matters updated in June 2021.

6.2.14 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.

6.2.15 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
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

6.2.16 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 or not 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

6.2.17 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.’

6.2.18 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.’

6.2.19 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.’

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

6.2.21 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'

6.2.22 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).

6.2.23 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.

6.2.24 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'

6.2.25 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.

6.2.26 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: BS8233: 2014 Indoor ambient noise levels for dwellings

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 $L_{Aeq,8hours}$	

6.2.27 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].

Department Stores & Restaurants: $\leq 55dB L_{Aeq,12hours}$ [equivalent to an external level of approximately $85dB L_{Aeq,12hours}$ based on typical standard double glazed units in the closed position and approximately $70dB L_{Aeq,12hours}$ in the open position].

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

6.2.28 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.”

- 6.2.29 In 2009, the WHO published: ‘Night Noise Guidelines for Europe’, which it describes as an extension to the WHO ‘Guidelines for Community Noise’ (1999). It concludes that: *“Considering the scientific evidence on the thresholds of night noise exposure indicated by $L_{night, outside}$ as defined in the Environmental Noise Directive (2002/48/EC), an $L_{night, outside}$ of 40dB should be the target of the night noise guideline (NNG) to protect the public, including the most vulnerable groups such as children, the chronically ill and the elderly. $L_{night, outside}$ value of 55dB is recommended as an interim target for those countries where the NNG cannot be achieved in the short term for various reasons, and where policy-makers choose to adopt a stepwise approach.”*

Road Traffic Noise

- 6.2.30 Access to the site would be gained from Stubbers Green Road along the southwest site boundary. To assess the likely impact on noise sensitive receptors from any traffic noise generated as a result of the Proposed Development on the local road network, noise calculations have been undertaken using ‘Calculation of Road Traffic Noise’ (“CRTN”) methodology and traffic flow information for the Proposed Development.
- 6.2.31 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).
- 6.2.32 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 are set out in Table 6.3 for the short term and 6.4 for the long term.

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

Short term magnitude	Short term noise change (dB L _{A10,18hr} or L _{night})
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
Negligible	Less than 1.0

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

Long term magnitude	Long term noise change (dB L _{A10,18hr} or L _{night})
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
Negligible	Less than 3.0

6.2.33 The impact magnitude categories can then be correlated with the receptor sensitivity categories in Table 6.7 to establish a level of effect as defined in Table 6.8.

6.2.34 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 CRTN methodology is used for the impact of 'off-site' road traffic.

Level and Significance of Effect

6.2.35 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 effect. 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.

6.2.36 Four types of receptor have been identified:

- Residents of existing and proposed houses adjacent to the Site who could experience site operational noise during the daytime.
- Residents of existing houses who could experience additional road noise from the Proposed Development

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- Recreational receptors adjacent to the Site who could experience site operational noise during the daytime.
 - Receptors associated with towpath users such as canal boats along Aldridge Daw End, Aldridge Marina and Daw End Northwood Moorings adjacent to the northern corner of the quarry who could experience site operational noise during the daytime (as advised by the Canal & River Trust consultees).

Operational Noise

6.2.37 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).”

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

Assessment of Significance

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

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

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

6.2.41 To help understand the effects of noise changes, descriptions of subjective response have been added. Table 6.5 below shows the proposed impact magnitude scale.

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

Site noise relative to background noise & absolute limits dB(A) in accordance with PPG criteria	Subjective Response	Impact Magnitude
<=10dB(A) and <55dB(A) Leq1hr	Complaint unlikely	Negligible
<=10dB(A) and >=55dB(A) Leq1hr	Complaint unlikely	Slight
>10dB(A) and <=55dB(A) Leq1hr	Marginal	Moderate
>10dB(A) and >55dB(A) Leq1hr	Complaint likely	Substantial to Severe

6.2.42 The criteria in Table 6.5 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) Leq1hr would represent a significant impact.

6.2.43 The impact magnitude scale in Table 6.6 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 6.6 below shows the impact scale used to assess temporary noise activities.

Table 6.6: 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) Leq1hr for up to 8 weeks, operational phase noise <=10dB(A) ¹ and <55dB(A) Leq1hr	Audible, complaint unlikely for short term activity	No significant impact (negligible)
Up to 70dB(A) Leq1hr for up to 8 weeks, operational phase noise <=10dB(A) ¹ and >=55dB(A) Leq1hr	Audible, potential for complaint depending on period of activity	Slight
Up to 70dB(A) Leq1hr for up to 8 weeks, operational phase noise >10dB(A) ¹ and <=55dB(A) Leq1hr	Annoying, complaint possible	Moderate
Up to 70dB(A) Leq1hr for up to 8 weeks, operational phase noise >10dB(A) ¹ and >55dB(A) Leq1hr	Annoying, complaint likely	Substantial to Severe

¹This refers to the site operational phase noise level relative to and above typical background noise at NSRs.

6.2.44 To assess the likely impact on NSRs 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 Sandown Site.

6.2.45 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 LA₁₀ 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

6.2.46 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 are set out in Table 6.8 for the short term and 6.9 for the long term.

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

Short term magnitude	Short term noise change (dB L _{A10,18hr} or L _{night})
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 6.9: Magnitude of Change – Road Traffic Noise- Long Term

Long term magnitude	Long term noise change (dB L _{A10,18hr} or L _{night})
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

6.2.47 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 6.10 have been adopted.

Table 6.10: 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.

6.2.48 Based upon the assessment of impact magnitude and the sensitivity of individual receptors, the matrix shown in Table 6.11 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 6.11: Level of Effect Matrix

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

6.2.49 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

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

Baseline

6.2.51 A baseline background sound survey was undertaken during a weekday period on the 8th July 2022 and was carried out in accordance with the advice given in BS4142: 2014+A1:2019.

6.2.52 The survey involved one fixed monitoring position to the rear of the nearest sensitive receptor and additional spot roaming measurement positions as indicated in Figure 6.1 (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.

6.2.53 The local sound environment is therefore generally formed by noise from local road traffic and birdsong.

6.2.54 The monitoring positions were as follows:

Position A (Rear of Dwellings off Stubbers Green Road) – South of Site

6.2.55 Monitoring position A is representative of the nearest receptors to the Site, which are located off Stubbers Green Road and adjacent to the southern site boundary. Noise levels at this location are generally affected by local road traffic noise. The monitoring position was chosen adjacent to the quarry land boundary behind the dwellings. Refer to Figure 6.1 for location.

Position B (Dwellings off Stubbers Green Road opposite to those at A) – South of Site

6.2.56 Spot roaming monitoring position B is indicative of the NSRs on the opposite side of the road to receptor A), i.e. free field position taken at a distance of circa 10m from Stubbers Green Road to represent property facades.

Position C (Aldridge Sailing Club)

6.2.57 Spot roaming measurements were recorded at the eastern boundary of Aldridge Sailing Club for establishing typical baseline residual levels.

Position D (Off Brook Meadow Road)

6.2.58 Position D was used to measure typical baseline levels at the more distant NSRs off Brook Meadow Road.

6.2.59 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.

6.2.60 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.

6.2.61 In consideration of the fact that the properties located immediately south of the quarry off Stubbers Green Road are the most sensitive, it is considered that the results are a good indication of typical background levels within rear amenity areas of properties at this receptor location. Receptors at much greater distance, would be subject to a lower level of impact due to a much greater separation distance.

Existing Background Sound Survey Results

6.2.62 The results of measurements taken at the fixed monitoring position are presented in Table 6.12 and detailed measurements are provided in Appendix 6.3. It should be noted that the baseline survey results were undertaken without any quarrying site operations and during periods outside of peak daytime traffic flows.

Table 6.12: Existing Background Sound Levels at Monitoring Positions (Weekday)

Monitoring Position	Time Period	LAeq dB	LA10	LA90 dB	LAmx dB	Representative LA90 dB
A) Rear of properties off Stubbers Green Road	0900-1400 ¹	55	54	48	59-84	47 ²
B) Properties south of Stubbers Green Road	1020-1120	61	63	48	75-78	48
C) Aldridge Sailing Club eastern boundary	0933-1003	53	55	48	62-70	48
D) Off Book Meadow Road	1144-1244	60	57	47	72-76	47

¹Taken during a period of lower traffic volume (i.e. avoiding peak traffic hours)

²Takes into account the mean and most commonplace LA90 based on statistical analysis, whichever is lowest.

6.2.63 The results of existing background sound measurements taken at the fixed and spot roaming noise monitoring positions indicate that representative background sound levels during the weekday daytime period (0900-1400 hours) are shown to be 47dB to 48dB LA90. The measured background sound level indicates that the noise limit according to PPG for Mineral Workings would be 55dB LAeq,1hr or background +10dB whichever is the lower (i.e. **55dB LAeq,1hr**) at the noise sensitive receptor (NSR) boundary.

Identification of Noise Sensitive Receptors (NSRs)

Residential Receptors (Existing or Proposed)

6.2.64 Based on distance relative to the Proposed Development, the NSRs are located south of the Site, off Stubbers Green Road (Receptor R1). The closest receptors are located at circa 40m from the nearest proposed Site activity relating to the quarry infill and restoration.

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- 6.2.65 Other residential receptors are to the west off Brook Meadow Road (R2) are at a much greater distance of circa 380m and the recreational receptor at the Aldridge Sailing Club (R3) to the southwest is located at circa 100m from the Site Development boundary.
- 6.2.66 Users of the canal towpath, marina and moorings are located adjacent to the northern corner of the quarry (receptor R4). Whilst these receptors could be located within 5m to 20m from the site boundary, the closest approach during final extraction and up to year 6 would be in excess of 180m distance from plant.
- 6.2.67 We are not aware of any other future receptors proposed that would be of greater sensitivity than those considered in this assessment.

6.3 Assessment of Effects

- 6.3.1 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.
- 6.3.2 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.
- 6.3.3 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 sections 6.2.65 to 6.2.67.

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- 6.3.4 An assessment has been undertaken on the following:
- operational activities including infilling of void works;
 - restoration activities of the void;
- 6.3.5 The site activities would involve the use of the following plant and machinery:
- Road Tipper HGVs
 - Excavator
 - Dozer
 - Tractor Driven Water Bowser
 - Self Propelled Roller (occasional)
- 6.3.6 The above 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.
- 6.3.7 The assessment of final extraction, infill and restoration activities is based on plant detailed in 6.3.5 above and empirical data on plant noise levels from other similar sites as outlined in Appendix 6.4.
- 6.3.8 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.
- 6.3.9 The unit used to assess construction noise is the Equivalent Continuous Sound Pressure Level, L_{Aeq} .
- Backfill with Suitable Restoration Material*
- 6.3.10 Suitable infill and restoration material will be imported to the Site over a circa 20-year period. The proposed phasing and restoration plans are illustrated on Drawing 5430/01/006 Rev A.
- 6.3.11 The final excavation of clay would take place from 2023 to 2026 and then the infill and restoration would take place between 2026 to 2043. This would include using

the plant detail provided in paragraph 6.3.5 above and restoration works which would include similar plant.

- 6.3.12 It is anticipated that infill material would be transported to the Site via HGVs. Based on the data provided within the Transport Assessment it is possible that a maximum of 150 loads of material per day could be transported to the site.
- 6.3.13 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 6.13 and Appendix 6.4 for further information.
- 6.3.14 The following table provides an indication of the highest likely noise levels during the void infilling and restoration activities.

Table 6.13: Predicted highest likely noise contribution from site operations (infill & restoration) at nearest receptors (refer to Appendix 6.5 for noise mapping)

Receptor	Void/Phase	Noise contribution from Site Operations LAeq _{1hr} dB	Proposed Noise Criteria in accordance with PPG guidance LAeq _{1hr} dB	Noise level difference between noise criteria & site noise LAeq _{1hr} dB
R1. Stubbers Green Road	Year 1 to 3	40-44	55	-15 to -11
	Year 3 to 6	41-46	55	-13 to -8
	Year 6 to 9	44-47	55	-11 to -8
	Year 9 to 12	51-57	55	-4 to +2
	Year 12 to 15	41-44	55	-14 to -11
	Year 15 to 18	49-54	55	-6 to -1
	Year 18 to 20	52-56	55	-3 to +1
R2. Brook Meadow Road	Year 1 to 3	32	55	-23
	Year 3 to 6	35	55	-20
	Year 6 to 9	38	55	-17
	Year 9 to 12	38	55	-17
	Year 12 to 15	38	55	-17
	Year 15 to 18	36	55	-19
	Year 18 to 20	38	55	-17
R3. Aldridge Sailing Club	Year 1 to 3	37-40	55	-18 to -15
	Year 3 to 6	40-42	55	-15 to -13
	Year 6 to 9	40-44	55	-15 to -11
	Year 9 to 12	44-46	55	-11 to -9
	Year 12 to 15	39-47	55	-16 to -8
	Year 15 to 18	41-44	55	-14 to -11
	Year 18 to 20	46-49	55	-9 to -6

R4. Towpath users to the north and northeast	Year 1 to 3	31-34	55	-24 to -21
	Year 3 to 6	32-37	55	-23 to -18
	Year 6 to 9	33-35	55	-22 to -20
	Year 9 to 12	31-35	55	-24 to -20
	Year 12 to 15	31-35	55	-24 to -20
	Year 15 to 18	32-35	55	-23 to -20
	Year 18 to 20	32-34	55	-23 to -21

6.3.15 The assessment of impact from site infill and restoration activities concludes that for the vast majority of the time at all NSRs there would be a **negligible** impact magnitude and **neutral** impact significance during peak periods of activity and as such these impacts are not considered significant in EIA terms. There is an increase above the PPG guidance threshold between year 6 to 9 and year 18 to 20 at R1 when the plant is within around 70m of Receptors R1. In this scenario the noise levels could increase to around 1dB to 2dB above the threshold, however this is just below or at 10dB above background and therefore the impact according to Table 6.5 would be **slight** and a **minor** effect. Paragraphs 6.4.1-6.4.2 provide further proposed mitigation measures to reduce noise impacts during this phase of work and comply with best practical means.

Road Traffic

6.3.16 The following table shows the likely increase in noise levels that would result from traffic associated with the Proposed Development. The traffic demand flows are provided in the Transport Assessment. This assessment considers the highest site traffic demand based on the operation of the Site activities over a 12-hour weekday (0700 to 1900 hours) and over a 5-hour Saturday operating period (0800-1300 hours). The impact includes for the effect of the additional traffic for the Brickworks.

Table 6.14: Noise level increase on the local road network as a result of increase in vehicle movements on and off Site based on 12 hour operating period

Local Road	Design Year	Predicted noise level 'do nothing' L _{A10 12hrs} dB	Predicted noise level 'do something' L _{A10 12hrs} dB	Noise level Change* L _{A10 12hrs} dB
1. Stubbers Road (west)	2023	66.5	67.0	+0.5
	2028	66.7	67.2	+0.5
2. Stubbers Road (east)	2023	66.7	67.7	+1.0
	2028	66.9	67.8	+0.9
3. Spring Road	2023	65.6	66.2	+0.6
	2028	65.8	66.4	+0.6

Note: Rounding of numbers in the calculation may give +/-0.1dB difference in the noise level change column. Change in noise levels at more distant local roads would yield lower change in noise levels than at Stubbers Green Road and have therefore not been included.

*This is calculated by logarithmically adding columns 3 and 4 and then subtracting column 3.

6.3.17 Table 6.14 above shows the predicted noise level change due to road traffic movement from the Proposed Development for the 2023 and 2028 operating years which shows a maximum increase range between +0.5dB(A) to +1.0dB(A) $L_{A10\ 12hrs}$ on the local road network.

6.3.18 In accordance with the Design Manual for Roads and Bridges, LA 111 'Noise and Vibration'; May 2020, there is no increase above +1.0dB(A) and therefore the change in noise levels as a result of the traffic associated with the proposed development is classified as being **negligible** in the short-term and long-term (with reference to Tables 6.8 and 6.9) and as such represents a **neutral** significance impact on high sensitivity residential receptors. As such the impact is not considered significant in EIA terms.

Table 6.15: Noise level increase on the local road network as a result of increase in vehicle movements on and off Site based on 5 hour Saturday operating period

Local Road	Design Year	Predicted noise level 'do nothing' $L_{A10\ 1hr}$ dB	Predicted noise level 'do something' $L_{A10\ 1hr}$ dB	Noise level Change* $L_{A10\ 1hr}$ dB
1. Stubbers Road (west)	2023	60.2	60.6	+0.4
	2028	60.4	60.8	+0.4
2. Stubbers Road (east)	2023	60.2	60.7	+0.5
	2028	60.4	60.8	+0.4
3. Spring Road	2023	60.2	60.6	+0.4
	2028	60.8	61.1	+0.3

Note: Rounding of numbers in the calculation may give +/-0.1dB difference in the noise level change column. Change in noise levels at more distant local roads would yield lower change in noise levels than at Stubbers Green Road and have therefore not been included.

*This is calculated by logarithmically adding columns 3 and 4 and then subtracting column 3.

6.3.19 Table 6.15 above shows the predicted noise level change due to road traffic movement from the Proposed Development for the peak hour periods for the 2023 and 2028 operating years. The result shows a maximum increase range between +0.3dB(A) to +0.5dB(A) $L_{A10\ 5hrs}$ on the local road network.

6.3.20 In accordance with the Design Manual for Roads and Bridges, LA 111 'Noise and Vibration'; May 2020, for the peak hour analysis, the result show a maximum increase +0.5dB(A) $L_{A10\ 1hr}$. Therefore, the change in noise levels as a result of the traffic associated with the Proposed Development is classified as being **negligible** in the short-term and long-term (with reference to Tables 6.8 and 6.9) and as such represents a **neutral** significance impact on high sensitivity residential receptors. As such the impact is not considered significant in EIA terms.

6.4 Mitigation Measures

Operational Noise

6.4.1 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:
Monday to Friday: 0700 hours and 1900 hours
Saturday: 0800 hours and 1300 hours
- Prior to year 9 construct an earth embankment or solid screen to the rear of Receptor R1 to a height of circa 3m. Refer to Figure 6.2.
- Regular maintenance of plant;
- Site management.

Site Management

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

- Maintain speed restriction on-site for HGVs;
- 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;
- Ensure plant is regularly maintained and fitted with efficient exhaust silencers;
- Engines to be switched off when not in use;
- Plant equipment should not have engine covers or hoods removed except for maintenance;
- Haul roads regularly maintained and gradient minimised to avoid high engine revving (where practicable); and
- 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.

Cumulative Impacts

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- 6.4.3 The Wienerberger Brickworks exist towards at the south-eastern corner of the overall Site, which would form part of the existing noise climate at NSRs. Based on site noise measurements the predicted noise contribution at receptors R1 is shown to be 36dB to 40dB L_{Aeq} . In terms of how this contributes to the predicted noise from the quarry site it would not have any significant effect on development noise levels at NSRs.
- 6.4.4 Other cumulative impacts considered include the following planning developments that are:
- (i) 21/0626 – Ibstock Brick Ltd, Atlas Factory – Extension to Brick Factory Building
- 6.4.5 This proposed development is located on land to the south of the Sandown Quarry site at a distance of circa 400m. A noise impact assessment was provided for the planning submission (ref: Aecom report 60616590 dated April 2021). The report shows predicted noise levels from the development at Stubbers Green Road (i.e. receptor R1) of 37dB $L_{Aeq,1hr}$. This would be circa 10dB below background at receptor R1 and therefore no likelihood of cumulative impacts for this development.
- (ii) 22/0548 – Lidl discount food store
- 6.4.6 The proposed development is located circa 600m north of the quarry. The application includes a noise impact assessment (ref. Acoustic Consultants Ltd report 9569/F dated 8th April 2022). The report predicts noise levels at the nearest sensitive receptor (which is circa 30m distance) of 35dB L_{Aeq} and therefore no likelihood of cumulative impacts for this development.
- 6.4.7 There are no known additional proposed developments in the area that would generate any significant additional noise source that needs to be considered in the cumulative assessment.

Future Baseline

- 6.4.8 The site has been assessed against the current baseline which includes some of the permitted noise sources in the area around the Proposed Development. The additional permitted developments which are not yet built, is unlikely to have any significant effect on future baseline levels, but any minor increase, as a result of additional traffic movements on background levels at NSRs would only help to reduce Site operational impacts (i.e. an increase in background level compared

with site generated noise would be lower than assessed). Impacts from permitted but not built development in respect of road traffic noise increase is taken into consideration within the transport assessment baseline. The traffic assessment includes the additional road traffic movements included for the cessation of clay extraction from the Sandown quarry and the 5% increase in clay to the Brickworks when the quarry no longer provides minerals.

6.5 Residual Effects and Conclusions

6.5.1 During the infill and restoration period of the development there would be a range of noise sources in use and noise levels would vary throughout the lifespan of the Proposed Development. The highest noise levels relative to NSRs are likely to occur during periods when infilling and restoration activities are towards the southern boundary of the Site. Best practical means would be employed to control the noise being generated.

6.5.2 The introduction of mitigation measures (refer to sections 6.4.1 to 6.4.2) has the effect of reducing noise levels at the NSRs in the sensitive direction (i.e. south). The results of the mitigation and resultant noise levels at NSRs are provided below in Table 6.16, which provides a noise reduction from year 9 onwards.

Table 6.16: Predicted Highest Likely Noise Contribution from site operations (infill & restoration) at nearest receptors (refer to Appendix 6.5 for noise mapping) including mitigation

Receptor	Void/Phase	Noise contribution from Site Operations LAeq _{1hr} dB	Proposed Noise Criteria in accordance with PPG guidance LAeq _{1hr} dB	Noise level difference between noise criteria & site noise LAeq _{1hr} dB
R1. Stubbers Green Road	Year 1 to 3	40-44	55	-15 to -11
	Year 3 to 6	41-46	55	-13 to -8
	Year 6 to 9	44-47	55	-11 to -8
	Year 9 to 12	43-47	55	-12 to -8
	Year 12 to 15	39-43	55	-16 to -12
	Year 15 to 18	42-46	55	-13 to -9
	Year 18 to 20	44-48	55	-11 to -7
R2. Brook Meadow Road	Year 1 to 3	32	55	-23
	Year 3 to 6	35	55	-20
	Year 6 to 9	38	55	-17
	Year 9 to 12	38	55	-17
	Year 12 to 15	38	55	-17
	Year 15 to 18	36	55	-19
	Year 18 to 20	38	55	-17

R3. Aldridge Sailing Club	Year 1 to 3	37-430	55	-18 to -15
	Year 3 to 6	40-42	55	-15 to -13
	Year 6 to 9	40-44	55	-15 to -11
	Year 9 to 12	46-49	55	-9 to -6
	Year 12 to 15	39-47	55	-16 to -8
	Year 15 to 18	41-44	55	-14 to -11
	Year 18 to 20	46-49	55	-9 to -6

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

6.5.4 The assessment of impact on existing residential areas from any increase in road traffic noise as a result of the Proposed Development shows no significant change in noise levels and therefore there is likely to be a **negligible** impact at receptors and **neutral** level of effect.

6.5.5 In summary, no significant noise effects have been identified by the noise assessment in relation to the Proposed Development. Table 6.17 below summarises the predicted effects of the operational and restoration of the development.

Table 6.17: Residual Impact at Nearest 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	Direct & Temporary	Daytime	Neutral to Slight	Mitigation	Neutral	Negligible
Cumulative Effects	Direct & Temporary	Daytime	Neutral	None required	Neutral	Negligible

Conclusions

6.5.6 Noise levels have been considered and assessed during the final extraction, 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 NRSs is within acceptable limits and no significant impacts are likely to occur.

6.5.7 To establish any likely impact from noise, an assessment of baseline sound levels has been considered by undertaking fixed position and spot roaming position noise

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- monitoring at four noise sensitive receptor areas around the Site over a weekday period.
- 6.5.8 The Council has been formally consulted on the scope of the EIA and have agreed the noise assessment methodology.
- 6.5.9 In accordance with appropriate standards, best practical means would be employed to control the noise generation during the operational period. Measures include boundary earth mound screening where required, restriction on operating hours, use of broadband type noise reversing alarms and management controls of plant maintenance and operation.
- 6.5.10 The effect of the Proposed Development on site has been considered and impacts presented in terms of the cumulative effect of any approved or proposed developments local to the Site from submitted planning applications.
- 6.5.11 The assessment shows that there would be no significant impacts during the final extraction, infill or restoration of the Proposed Development.

6.6 References

National Planning Policy Framework – July 2021

Noise Policy Statement for England (NPSE) – March 2010

National Planning Practice Guidance (NPPG) June 2021

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

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

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

World Health Organisation: 'Guidelines for Community Noise' - April 1999

Department of Transport 'Calculation of Road Traffic Noise': 1988

Design Manual for Roads and Bridges, LA 111 'Noise and Vibration'; May 2020

Calculation of Road Traffic Noise (CRTN): Department of Transport 1988

ISO 9613-2: 1996 Acoustics – Attenuation of Sound During Propagation Outdoors

BS7445: 2003 - Description and measurement of environmental noise