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ACOUSTIC CONSULTANTS

Town and Country Planning Act 1990

Section 78 Appeal

Ref: APP / E1885 / W / 22 / 3310099

Land at Lea Castle Farm, Wolverley Road, Broadwaters, Kidderminster, Worcestershire

Appeal by NRS Aggregates Limited against the refusal of planning permission by Worcestershire County Council

Proof of Evidence of Rachel Canham with regard to Noise

Author	Rachel Canham BEng MSc CEng FIOA
Date	27 January 2023
Revision	Final
WBM Ref	5342

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1 Qualifications and Credentials

1.1 My name is Rachel Canham. I am a Director of Walker Beak Mason Limited (WBM), which specialises in acoustic consultancy. My professional address is Steepleton Lodge Barn, Long Lane, East Haddon, Northamptonshire, NN6 8DU.

1.2 WBM is an independent acoustic consultancy that deals with environmental assessments, architectural and building acoustics, and planning application and appeals work. WBM is a member of the Association of Noise Consultants and is an Associate Assessor Member of the Institute of Environmental Management and Assessment.

1.3 I hold the degrees of Bachelor of Engineering in Electroacoustics from Salford University in 1993 and a Master of Science in Environmental Acoustics from London South Bank University in 1998. I became a Chartered Engineer in 2003 and a Fellow of the Institute of Acoustics in 2011. I have been practicing as an acoustic consultant since 1993 and joined WBM in 1999.

1.4 Via WBM I have worked as an acoustic consultant for many of the major mineral extraction companies in the UK on a wide range of surface mineral workings, aggregate related plant sites, waste disposal and recycling projects as well as other industrial sites. I have produced environmental noise reports for planning applications, noise impact assessments and environmental statements.

1.5 WBM has been involved with the consideration of noise for the proposed quarry at the Lea Castle site since 2018, which included undertaking baseline noise surveys, attendance at the public exhibition and preparation of the noise assessment for the environmental statement for the planning application.

1.6 The noise assessment for the proposed quarry dated September 2019 was prepared by Dr Paul Cockcroft, who has since retired. However, I attended the public exhibition about the site, providing information about noise where required. I am therefore familiar with the noise aspects of the proposed development at this site.

1.7 The evidence that I have prepared and provided for this appeal is true and has been prepared and given in accordance with the guidance of my professional institution (the Code of Conduct of the Institute of Acoustics).I confirm that the opinions expressed are my true and professional opinions.

2 Scope of Evidence

2.1 My evidence deals with potential noise arising from quarrying, processing and restoration activities within the proposed quarry site at Lea Castle Farm.

2.2 My evidence will address the noise related reasons for the refusal of the planning application for the proposed quarry, and the comments received from Worcestershire County Council (WCC) and the Rule 6 party (Stop the Quarry Campaign) with regard to noise as set out in their Statements of Case (SoC).

2.3 I will refer to the previous noise assessment undertaken by WBM for the application, as detailed in Section 5 of this document, along with guidance documents related to the assessment of noise impact from mineral sites along with other relevant guidelines. I will also refer to the application details of additional permitted or allocated residential developments and comment on cumulative impact.

2.4 In summary, I have responded to the various comments on noise including the consideration of cumulative impact and shown that this does not affect the outcome of the original noise assessment.

2.5 To aid understanding, a glossary of acoustic terms is provided in Appendix A.

3 Planning Policies and Guidance for Minerals and Noise

3.1 The previous noise assessment report prepared by WBM for the proposed quarry site referred to various guidance documents regarding noise and minerals. For completeness, these are replicated below along with any updated information that has subsequently become available.

Noise Policy Statement for England

3.2 The Noise Policy Statement for England (NPSE) was published in March 2010. The aim of the document is to "…*provide clarity regarding current policies and practices to enable noise management decisions to be made within the wider context, at the most appropriate level, in a cost-effective manner and in a timely fashion*".

3.3 The long term vision of noise policy is to "*Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development*".

3.4 The long term vision is supported by three 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*."

3.5 The Explanatory Note to the NPSE introduces the concepts of observed effect levels with regard to noise.

3.6 NOEL (No Observed Effect Level) - this is the level below which no effect can be detected, i.e. below this level there is no detectable effect on health and quality of life due to noise.

3.7 LOAEL (Lowest Observed Adverse Effect Level) – this is the level above which adverse effects on health and quality of life can be detected due to noise.

3.8 SOAEL (Significant Observed Adverse Effect Level) – this is the level above which significant adverse effects on health and quality of life occur due to noise.

3.9 With regard to the first aim of the NPSE, any noise impacts that are above SOAEL should be avoided.

3.10 Where the impact lies somewhere between LOAEL and SOAEL, the second aim of the NPSE requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life. However, as stated in paragraph 2.24 of the Explanatory Note to the NPSE "*This does not mean that such adverse effects cannot occur*".

National Planning Policy Framework

3.11 The National Planning Policy Framework (NPPF) set out the Government's planning policies for England. The version that was in force at the time WBM prepared the quarry noise assessment of September 2019 was dated February 2019, however this has now been superseded by the version dated July 2021. The following text refers to the latest, July 2021 version of the document. However, the content is very similar to the previous February 2019 version.

3.12 Section 15 of the NPPF (*Conserving and enhancing the natural environment*) refers specifically to noise in the following paragraphs:

"*174. Planning policies and decisions should contribute to and enhance the natural and local environment by…*

(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..."

"*185. 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…"

3.13 Paragraph 185 (a) above refers to the Explanatory Note to NPSE, 2010.

3.14 Paragraph 187 refers to the integration of new development with existing businesses and facilities:

"*187. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed*"

3.15 Mineral sites are considered in Section 17 "Facilitating the sustainable use of minerals" of the NPPF:

"*210. Planning policies should …*

(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 extraction..."

"*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…*

(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..."

3.16 Paragraph 211 (c) advises that the national planning guidance on minerals sets out how these policies should be implemented, see the following section.

Planning Practice Guidance Noise (PPGN)

3.17 Technical guidance on noise is provided by Planning Practice Guidance, published by the Ministry of Housing, Communities & Local Government.

3.18 Planning Practice Guidance Noise (PPGN) was published in March 2014 and updated in July 2019. PPGN provides advice on how planning can manage potential noise impacts in new development. It makes reference to the Explanatory Note of the NPSE and the NPPF.

3.19 Paragraph 005 Reference ID: 30-005-20190722 of the PPGN provides guidance on how to establish if noise is likely to be a concern, including a table summarising the noise exposure hierarchy based on the likely average response of those affected.

Table 1: Summary of Noise Exposure Hierarchy, based on the likely average response

Response	Examples of outcomes	Increasing effect level	Action
No Observed Effect Level			
Not present	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum

Table 1: Summary of Noise Exposure Hierarchy, based on the likely average response			
Response	**Examples of outcomes**	**Increasing effect level**	**Action**
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. 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, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

3.20 The “Examples of Outcomes” tabulated above can be referred to in the consideration of the effects of impacts.

Planning Practice Guidance Minerals (PPGM)

3.21 Specific guidance for the assessment of noise from mineral sites is provided in the 'Minerals' section of the Planning Practice Guidance, which provides advice regarding the setting of noise limits for such operations.

3.22 Paragraphs 19 to 22 inclusive of the “Minerals” chapter of the Planning Practice Guidance, are under the heading “Noise emissions” within the section “Assessing environmental impacts from mineral extraction” (dated March 2014)

3.23 Paragraph 019 Reference ID: 27-019-20140306 states:

"***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*."

3.24 Paragraph 020 Reference ID: 27-020-20140306 states:

"***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."

3.25 Paragraph 021 Reference ID: 27-021-20140306 states:

"***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 bleepers, may also require separate limits that are independent of background noise (e.g. 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."

3.26 Paragraph 022 Reference ID: 27-022-20140306 states:

"***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 eight 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 eight 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."

3.27 With regard to cumulative impact of minerals development, this is addressed in Paragraph 017 Reference ID: 27-017-20140306:

"***How should mineral planning authorities assess the cumulative impact of minerals development?***

Some parts of a mineral planning authority area may have been subjected to successive mineral development (such as aggregate extraction or surface coal mining) over a number of years. Mineral planning authorities should include appropriate policies in their minerals local plan, where appropriate, to ensure that the cumulative impact of a proposed mineral development on the community and the environment will be acceptable. The cumulative impact of mineral development is also capable of being a material consideration when determining individual planning applications."

Local Authority Guidance

WRS Noise Control Technical Guidance

3.28 At the time WBM prepared the noise assessment for the proposed quarry (September 2019), local guidance on noise was provided by Worcestershire Regulatory Services (WRS) within the "*Noise Control Technical Guidance – Development Control*" 1st Edition November 2013 Version 1.2.4.

3.29 The WRS "*Noise Control Technical Guidance*" was reviewed and found to contain no information specifically for mineral sites. Accordingly, the latest Government advice for such sites contained within planning practice guidance for minerals was used for the noise assessment undertaken by WBM in September 2019.

3.30 Since the refusal of the application, this document appears to have been superseded by the WRS document "Technical Guidance Note for Planning (November 2022), Section 5 "Noise and Vibration – Technical Guidance". As found in the previous WRS document, there is no specific guidance relating to mineral sites.

Waste Core Strategy for Worcestershire, Adopted Waste Local Plan 2012-2027

3.31 WBM did not refer to this document in the quarry noise assessment of September 2019, as the proposal is not a waste management facility. However, this document has been referenced by Worcestershire County Council in their statement of case.

3.32 The Waste Core Strategy for Worcestershire, Adopted Waste Local Plan 2012-2027 (November 2012) provides guidance on the approach to planning for the county's waste management facilities. Noise in mentioned in Policy WCS 14: Amenity:

"*Waste management facilities will be permitted where it is demonstrated that the operation of the facility and any associated transport will not have unacceptable adverse impacts on amenity. This must consider impacts on or of:…*

iii. noise and vibrations…"

3.33 Policy WCS 14 also requires cumulative effects to be considered.

3.34 Noise is also mentioned in paragraph 7.9 of Section 7 of the document (*Safeguarding existing waste management* facilities) under the section "*New sensitive receptors*":

3.35 "*Applicants may need to assess issues such as any noise, vibrations, dust, odours or fumes that may result from the normal operation of the site. Bio-aerosols should be considered where the waste management facility handles biodegradable waste. Where impacts are likely to affect the proposed development, considered design, site layout and landscaping or screening of the proposal will normally be adequate to mitigate any impacts*."

Worcestershire Minerals Local Plan (July 2022)

3.36 This document was adopted in July 2022, after the application for the proposed quarry was submitted. Noise is mentioned in Policy MLP 28: Amenity:

"*Planning permission will be granted where it is demonstrated that the proposed mineral development, including associated transport, will not give rise to unacceptable adverse effects on amenity or health and well-being.*

A level of technical assessment appropriate to the proposed development will be required to demonstrate that, throughout its lifetime and taking into account the cumulative effects of multiple impacts from the site and/or a number of sites in the locality, the proposed development will not cause unacceptable harm to sensitive receptors from:…

c) noise and vibration"

3.37 Noise is also considered in the section "Noise and vibration", paragraphs 6.34 to 6.39 of the Worcestershire Minerals Local Plan. The paragraphs referring to noise are reproduced below:

"*6.34 The introduction of sources of noise or vibration can impact on the use, enjoyment and tranquillity of a locality, and can cause an intrusion that can adversely impact on quality of life, health and well-being.*

6.35 Potential sources of noise within typical mineral operations include extraction activities and the operation of processing plant, haulage vehicles and conveyors. Activities such as soil-stripping, the construction and removal of baffle mounds, soil storage mounds and spoil heaps, the construction of new permanent landforms, and aspects of site road construction and maintenance may also be noisy in the short term. Each source of noise might have a different characteristic and intensity, and could be capable of causing significant impacts if not properly controlled. After-uses also have the potential to introduce or alter the source, type or level of noise arising from the site.

6.37 An assessment will be required where there are likely to be impacts from noise or vibration. This should identify potential sources of noise and vibration, their general character and the location of noise-sensitive or vibration-sensitive receptors, including properties. Reference should be made to the types and levels of noise or vibration, the time of day noise or vibration will occur, whether they will be continuous or intermittent and the pattern and duration of their occurrence, as well as the prevailing acoustic environment and local factors such as topology and topography.

6.38 Where noise or vibration impacts are identified, mitigation measures should be incorporated to ensure that effects are managed to an acceptable level. This might include appropriate design, layout and phasing of operations to increase the distances between the source of noise and potential receptors or to minimise noise transmission through the use of screening by natural barriers, planting or purpose-built features. Setting noise limits at sensitive properties, controlling working hours, and/or monitoring of noise conditions at mineral workings could also safeguard against disturbance from the site.

6.39 Where noise impacts cannot be avoided it may be appropriate to allow temporary increases in daytime noise to facilitate essential site preparation or restoration works; however, clear long-term benefits would need to be demonstrated."

3.38 Paragraphs 6.38 and 6.39 of the Worcestershire Minerals Local Plan refer to the guidance provided in PPGM with regard to noise limits and the duration of temporary works.

Wyre Forest District Local Plan 2016-2036 (April 2022)

3.39 This document was adopted in April 2022 , after the application for the proposed quarry was submitted. Chapter 15 "Pollution Minerals and Waste" contains Policy SP.33 – Pollution and Land Instability. Policy SP.33 does not specifically mention noise but states "*Development proposals must be designed in order to avoid any significant adverse impact from pollution, including cumulative ones*…"

3.40 Paragraph 15.3 of the document confirms that the term "pollution" includes noise.

3.41 Policy SP.LCV1 – "Lea Castle vision" refers to the strategic allocation for Lea Castle Village. The allocation is for the whole site, centred on the former hospital site and bounded by the A449 (Wolverhampton Road), Axborough Lane, the A451 (Stourbridge Road) and the B4190 (Park Gate Road).

4 Reasons for Refusal

4.1 Planning permission for the proposed quarry was refused on 27 May 2022. The stated reasons for refusal of planning permission for the proposed quarry were:

1. Contrary to Policy 2 (Other Sand and Gravel Deposits) of the County of Hereford and Worcester Minerals Local Plan (Adopted April 1997) (Saved Policies);

2. Unacceptable impact on openness of the Green Belt;

3. Unacceptable impact on residential amenity and local schools;

4. Unacceptable impact on the local economy;

5. Loss of 2 Tree Preservation Order (TPO) trees;

6. Unsuitable bridleway next to the Wolverhampton Road (A449);

7. Unacceptable impact on highways;

8. Unacceptable general impact on environment and wildlife; and

9. Unacceptable impact on health of local population.

4.2 Noise was not specifically listed as a reason for refusal.

Statement of Common Ground

4.3 A Statement of Common Ground has been agreed between NRS Aggregates Limited & Worcestershire County Council, dated January 2023. The following is agreed with regard to noise (paragraph 7.12):

"*It is agreed that a Noise Impact Assessment was submitted in support of the planning application. Worcestershire Regulatory Services, the statutory consultees with regard to noise impacts, were satisfied that the Noise report confirms conditions to be within national guidance relating to noise and that the measured noise levels calculated were robust in isolation. Worcestershire Regulatory Services are satisfied that there are no adverse noise impacts associated with the proposed workings in isolation*."

4.4 The matters of disagreement relating to noise, and which are to be defended by WCC, relate to refusal number 3 (paragraph 8.2):

"*With reference to reason for refusal 3: impact on residential amenity and schools, the parties disagree on the following matters…*

- *The cumulative impact of the development in conjunction with adjacent permitted and allocated development as secured by consent 17/0205/OUTL and Wyre Forest Local Plan Policy SP.LCV1 on the noise environment for nearby residential receptors.*
- *The cumulative impact of dust and noise from the development in conjunction with adjacent permitted and allocated development as secured by consent 17/0205/OUTL and Wyre Forest Local Plan Policy SP.LCV1 on the quality of the environment of Heathfield Knoll School and First Steps Nursery*."

WCC Statement of Case

4.5 WCC prepared a Statement of Case (SoC) for the appeal relating to the proposed quarry application at Lea Castle Farm lodged by NRS Aggregates . The document was circulated on 6 January 2023.

4.6 Of the nine reasons for refusal, WCC proposed to defend reason 2 (unacceptable impact on openness of the Green Belt) and reason 3 (Unacceptable impact on residential amenity and local schools). Noise is only relevant to reason 3.

4.7 Paragraphs 5.6 and 5.7 refer to the use of bunds as mitigation.

"*5.6 The appellants include a Noise Assessment within their planning submission; this identified a calculated daytime operations noise impact that sat just below recommended limits, in isolation, for a number of dwellings and receptors including Broom Cottage, South Lodges and Heathfield Knoll School*.

5.7 The identified noise impact is proposed to be mitigated by use of bunds. The Council will demonstrate in evidence that in siting bunds adjacent to residential properties, some up to 6m high, a detrimental impact to the visual outlook of impacted properties occurs as a result."

4.8 Note that visual impact is not considered in this proof but is addressed by Mr Neil Furber in his Landscape and Visual proof.

4.9 Paragraphs 5.8, 5.12, 5.14 and 5.15 refer to cumulative impact on amenity, in particular due the development at Lea Castle Village.

"5.8 *The Council will demonstrate in evidence that irrespective of the proposed mitigation measures, the noise impact of development offers cumulative harm to the amenity of receptors within the locality of the site, and that the additional mitigation recommended to be implemented by Worcestershire Regulatory Services, including a restriction to working hours, is effective only in isolation. The noise environment concluded to provide 'the occasional identifiable noise being heard from use of machinery associated with the extraction' in combination with other environmental impacts, will be demonstrated as offering cumulative harm to amenity*.

5.12 Cumulative Impact was considered within the appellants Environmental Statement, and within an updated Non-Technical Summary during the application. The appellants conclude that the proposed minerals works could satisfactorily co-exist with the permitted and allocated development at Lea Castle Village without offering any cumulative harm. However, no further technical or cumulative assessment on dust or air quality was undertaken to draw this conclusion; the appellants remain reliant on their Vibrook [sic] *Air Quality Assessment of 2019 and it does not consider cumulative impact. Furthermore, no revised cumulative assessment on the impacts of combined noise effects with the Lea Castle Village allocation has been undertaken to draw this conclusion*

5.14 The Council will demonstrate in evidence that the existing review of noise impacts have failed to satisfactorily consider either the impact on an allocated development, secured within the Wyre Forest District Local Plan, or the combined impact of such developments being located within 250m of each other on the area as a whole.

5.15 In drawing these conclusions, the Council will agree in part with the objection raised by Wyre Forest District Council to the application, due to the direct 'adverse impact on existing and future residential dwellings, both in close proximity and further from the site, impacting on their amenity, through adverse noise, dust and vibrations. It would also impact on the wider community reducing the ability to enjoy recreational routes and outdoor space'."

4.10 Paragraphs 5.18, 5.19 and 5.20 and 5.15 refer to the noise impact on the school and nursery, again with reference to cumulative impact from the Lea Castle Village.

"*5.18 The appellants noise assessment identifies the school as one of the sites sitting closest to daytime noise limits of general working operations of the proposed development and mitigation to secure this relies on the implementation of a bund. The school can be expected therefore to be subject to, in isolation, a noise environment concluded by the Worcestershire Regulatory Services to be of 'occasional identifiable noise being heard from use of machinery associated with the extraction'.*

5.19 The combined noise, air and dusts impacts on the school and nursery are concluded by the appellant to be within acceptable ranges, subject to the implementation of mitigation, and Worcestershire Regulatory Services considers the mitigation plan 'strong enough'.

5.20 The Council will demonstrate in evidence that no assessment is provided to determine whether the mitigation plan is "strong enough" when a cumulative impact of the development in combination with Lea Castle Village is assessed. The appellant relies solely on the conclusion that the developments can work in harmony, as the minerals works are temporary."

4.11 Responses to these points raised by WCC will be addressed within this proof.

Rule 6 Party (Stop the Quarry Campaign) Statement of Case

4.12 The Rule 6 Party, Stop the Quarry Campaign (STQC) prepared a Statement of Case dated 05 January 2023. They propose to defend all nine reasons for refusal.

4.13 With regard to noise, the STQC SoC state the following with regard to Reason 3 (unacceptable impact on residential amenity and local schools):

"7.21 *In terms of residential amenity, STQC believes that the applicant has failed to properly assess the impacts, seeking to find little or no adverse impacts throughout it's reporting. There are significant amenities which will be affected by noise and dust. Local schools are very close and whist reports anticipate noise levels within guidelines STQC is still concerned given just how close local schools and with the same daytime hours as the quarry*."

4.14 Noise is also mentioned in general terms in paragraph 7.55: "*STQC have very serious concerns in respect of the evidence presented and accepted by WCC in respect of noise and the impact of noise*." However, no further details are provided.

5 Previous Noise Assessment

5.1 The previous noise assessment for this site was completed by Dr Paul Cockcroft of WBM in September 2019. Dr Cockcroft retired in 2022 and is no longer working in acoustic consultancy.

5.2 It is noted that the noise assessment completed by WBM was found by WCC to be acceptable "in isolation". In summary, the previous assessment determined baseline noise levels at the nearest noise receptors to the proposed quarry, which were measured in 2018. Sample noise measurements were undertaken on three separate days at all locations and installed sound level meters measured noise levels over a week at two locations.

5.3 The results of the baseline noise surveys were used to set limits for site noise from normal, day to day operations, which are 10 dB above the background noise levels ($L_{A90,T}$), with an upper limit of 55 dB $L_{Aeq,1h}$. The site noise limits are based on guidance set out in PPGM.

5.4 Site noise calculations were undertaken to each receptor for a reasonable worst case scenario, i.e. with all mobile plant items operating at the closest practical position of the proposed operating areas to each receiver location. The calculations assumed that all plant on site operates simultaneously in the closest likely working areas to each receiver location for both extraction and infilling. For most dwellings, the activity in the phases for extraction and infilling would not take place simultaneously at the closest part of the site (in practice, these two activities would be taking place in different phases of the development). The actual quarry site noise levels would generally be lower than the calculated worst case values.

5.5 A summary of the measured baseline noise levels, suggested site noise limits and 'reasonable worst case' calculated site noise levels, is presented in Table 2.

Table 2: Summary of Previous Noise Assessment Baseline and Site Noise Levels

Receptor	Baseline Noise Levels (June / July 2018)		Suggested Site Noise Limit dB $L_{Aeq,1h}$	Calculated Site Noise Level dB $L_{Aeq,1h}$
	Average Ambient dB $L_{Aeq,T}$	Average Background dB $L_{A90,T}$		
1. Broom Cottage	51 (54)*	41 (43)*	53	51
2. South Lodge	55	47	55	54
3. Heathfield Knoll	55	48	55	53
4. Brown Westhead Park	54	36	46	45
5. McDonalds Bungalow	43	35	45	45
6. Keeper's Cottage	49	39	49	46
7. Castle Barns	45 (47)*	39 (41)*	51	48

* Values in brackets were determined from the results from installed sound level meters. All other results are from sample measurements.

5.6 The calculated site noise levels are all at or below the PPGM site noise limits for normal, day to day operations.

5.7 The calculated levels from temporary operations, e.g. overburden stripping, bund formation and the final restoration processes, were also calculated and found to be at or below the site noise limit of 70 dB $L_{Aeq,1h}$ which also complies with limits for such activities set out in PPGM. Note that temporary operations are permitted a higher noise limit, but are restricted in terms of duration and should not exceed a total of eight weeks duration at any noise sensitive properties in any twelve month period.

5.8 The noise assessment was undertaken for the nearest noise sensitive properties to the proposed quarry.

6 Impact on Allocated Development

6.1 For the noise assessment prepared for the proposed quarry at Lea Castle Farm, WBM included the receptors nearest to the site that were considered to have the worst potential noise impact.

6.2 At the time that WBM prepared the noise assessment for the proposed quarry in September 2019, there were two housing developments in the vicinity that were approved by Wyre Forest District Council:

- Former Lea Castle Centre (17/0205/OUTL) approved in June 2019
- Stourbridge Road (18/0163/FULL) approved in August 2018

6.3 Both of these developments are further from the proposed quarry site than the noise sensitive receptors included in the WBM noise assessment of September 2019.

6.4 Additional residential properties/developments in the area have subsequently been permitted or have had applications submitted to Wyre Forest District Council. These include:

- Four bungalows on Brown Westhead Park (20/0217/FUL) approved in July 2020
- Four residential dwellings at Wolverley Lodge (22/0235/PIP) submitted in May 2022 (re-submission of 18/0748/PIP)
- Lea Castle Village (22/0404/OUT) submitted in May 2022

6.5 The impact of noise from the proposed quarry on all of these receptors has been considered.

6.6 The majority of these applications do not have associated noise assessments and hence do not have baseline noise data on which suggested site noise limits could be derived. However the additional receptor locations are reasonably near to baseline noise survey locations previously used in the WBM quarry noise assessment report of 2019. As such, I have assumed baseline background noise levels based on the noise levels previously measured by WBM.

6.7 As set out in the Statement of Common Ground, WRS were satisfied that the previous calculated noise levels in the report prepared by WBM were robust, albeit in isolation. As such, the same calculation model as used for the quarry noise assessment undertaken by WBM in 2019 has been used for these additional receptors.

Former Lea Castle Centre (17/0205/OUTL)

6.8 This site is located to the east of the proposed quarry. This is an outline application for up to 600 dwellings, employment uses and mixed use space. The nearest proposed housing is located approximately 600 metres from the closest extraction point on the proposed quarry site and 900 metres from the plant site.

6.9 Planning permission for this development was granted in June 2019, subject to conditions, none of which relate specifically to noise.

6.10 Condition 20 required submission of a Construction Environmental Management Plan (CEMP) for the first reserved matter application for the development or the first reserved matters application for each phase of development. The CEMP is to include a Construction Method Statement with details of the noise, including acoustic screening. Noise and vibration management plans are also required.

6.11 A Construction Management Plan has been uploaded to the planning portal at Wyre Forest District Council that shows the different development parcels. However, no CEMPs, construction method statements or noise and vibration management plans appear to have been uploaded so this information including that regarding construction noise levels is not publicly available.

6.12 From review of the site using Google Maps, housing on the site is under construction.

6.13 There was no noise report submitted with the application and as a result, no baseline noise levels reported for this site. It is envisaged that The A449 Wolverhampton Road would be the main source of environmental noise affecting the proposed residential site. The proposed houses are to be located over 300 metres from this road.

6.14 It is assumed that the baseline noise levels at the proposed housing would be similar to those measured by WBM at Location 6 Keepers Cottage, which is around 400 metres from Wolverhampton Road. The average background noise level at Keepers Cottage, measured in 2018 was 39 dB $L_{A90,T}$. Using guidance in PPGM, this indicates that 49 dB $L_{Aeq,1h}$ would be an appropriate site noise limit at this location.

6.15 The calculated site noise level for normal, day to day operations is 39 dB $L_{Aeq,1h}$ for the housing at the Former Lea Castle Centre site. This is well below the suggested PPGM site noise limit of 49 dB $L_{Aeq,1h}$ at this location.

6.16 The calculated noise due to temporary operations is 41 dB $L_{Aeq,1h}$. This is also well below the PPGM noise limit of 70 dB $L_{Aeq,1h}$ for such activities.

6.17 As such, operations at the proposed quarry at Lea Castle Farm would not cause an impact at the proposed residential development at the Former Lea Castle Centre site.

Stourbridge Road (18/0163/FULL)

6.18 This site is located to the south-east of the proposed quarry. This is a full planning application for 91 dwellings located on land off Stourbridge Road. The nearest housing is located over 700 metres from the closest extraction point on the proposed quarry site and approximately 1 kilometre from the plant site.

6.19 A noise assessment report was submitted as part of the planning application, prepared for Miller Homes by Wardell Armstrong ("Miller Homes, Land off Stourbridge Road, Kidderminster, Noise Assessment Report"). The report included the results of noise measurements undertaken on the site in 2015, in which the baseline noise levels were found to be mainly influenced by road traffic noise. The report provided recommendations for mitigation to the dwellings to control road traffic noise levels.

6.20 The noise report included seven samples measured during daytime hours. The daytime background noise levels ranged from 42 to 47 dB $L_{A90,T}$ with an average level of 44 dB $L_{A90,T}$. This is in keeping with the background levels measured in the area by WBM in 2018.

6.21 There was no mention or consideration of construction noise within the noise report submitted with the application.

6.22 Planning permission was granted in August 2018, subject to conditions. Condition 18 required the noise mitigation strategy for glazing, ventilation and boundary treatments to be as set out in the noise assessment report.

6.23 Condition 14 required submission of a Construction Environmental Management Plan (CEMP) prior to commencement of the development. The CEMP does not appear to have been uploaded to the planning portal at Wyre Forest District Council so this information is not publicly available.

6.24 From a review of the site using Google Maps, the housing has been constructed and is now occupied.

6.25 The 2015 baseline noise survey information included in the noise report submitted with that application had an average daytime background noise level of 44 dB $L_{A90,T}$. Using the guidance in PPGM, this indicates that 54 dB $L_{Aeq,1h}$ would be an appropriate site noise limit at this location.

6.26 The calculated site noise level for normal, day to day operations is 37 dB $L_{Aeq,1h}$ for the housing off Stourbridge Road. This is well below the suggested PPGM site noise limit of 54 dB $L_{Aeq,1h}$ at this location.

6.27 The calculated noise due to temporary operations is 39 dB $L_{Aeq,1h}$. This is also well below the PPGM noise limit of 70 dB $L_{Aeq,1h}$ for such activities.

6.28 As such, operations at the proposed quarry at Lea Castle Farm would not cause an impact at these dwellings.

Four bungalows on Brown Westhead Park (20/0217/FUL)

6.29 This site is located to the west of the proposed quarry and is a full planning application for four 2-bedroom bungalows off Brown Westhead Park. Planning permission was granted in July 2020, subject to conditions, none of which relate to noise. From review of the site using Google Maps, the bungalows have been constructed and appear to be occupied.

6.30 The bungalows are next to the WBM survey and assessment designated Location 4 (Brown Westhead Park). As such, the baseline noise conditions, site noise limit and calculated site noise levels would be the same as those determined for Location 4, Brown Westhead Park.

6.31 The WBM 2018 baseline noise surveys had an average daytime background noise levels of 36 dB $L_{A90,T}$ at this location Using guidance in PPGM, this indicates that 46 dB $L_{Aeq,1h}$ would be an appropriate site noise limit at this location.

6.32 Using the same site noise calculation as Location 4, the calculated site noise level for normal, day to day operations is 45 dB $L_{Aeq,1h}$ for the bungalows. This complies with the suggested PPGM site noise limit of 46 dB $L_{Aeq,1h}$ at this location.

6.33 The calculated noise due to temporary operations is 63 dB $L_{Aeq,1h}$. This also complies with the PPGM noise limit of 70 dB $L_{Aeq,1h}$ for such activities.

6.34 As such, operations at the proposed quarry at Lea Castle Farm would not cause any significant impact at these bungalows.

Four residential dwellings at Wolverley Lodge (22/0235/PIP)

6.35 This site is located over 300 metres further to the west than the four bungalows off Brown Westhead Park.

6.36 Permission in Principle was previously approved under planning reference 18/0448/PIP, but this has expired. The previous Permission in Principle was granted in February 2019, subject to the submission of various technical details and assessments. There was no requirement to submit a noise assessment.

6.37 An updated application for the dwellings was submitted in March 2022. No noise assessment was included in the submission.

6.38 It is assumed that the baseline noise levels at the proposed dwellings would be similar to those measured by WBM at Location 4 (Brown Westhead Park). The average background noise level at Location 4, measured in 2018 was 36 dB $L_{A90,T}$. Using guidance in PPGM, this indicates that 46 dB $L_{Aeq,1h}$ would be an appropriate site noise limit at this location.

6.39 The calculated site noise level for normal, day to day operations is 43 dB $L_{Aeq,1h}$ for the housing at Wolverley Lodge. This complies with the suggested PPGM site noise limit of 46 dB $L_{Aeq,1h}$ at this location.

6.40 The calculated noise due to temporary operations is 46 dB $L_{Aeq,1h}$. This is below the PPGM noise limit of 70 dB $L_{Aeq,1h}$ for such activities.

6.41 As such, operations at the proposed quarry at Wolverley Lodge would not cause any significant impact at these dwellings.

Lea Castle Village (22/0404/OUT)

6.42 This site is located to the east of the proposed quarry, adjacent to the Former Lea Castle Centre site.

6.43 This is an outline application for a mixed development including up to 800 dwellings. The nearest proposed housing is located approximately 250 metres from the closest extraction point on the proposed quarry site and 600 metres from the plant site.

6.44 The planning application was submitted in May 2022. A noise assessment report was submitted as part of the planning application, prepared for Homes England by Wood Group ("Lea Castle Village, Kidderminster, Outline Planning Application, Site Suitability assessment – Noise"). The report included the result of a single noise measurement undertaken adjacent the A449 (near the junction with Wolverley Road) in 2021 with a reported result of 75 dB $L_{A10,18h}$. No other noise parameters were presented. The purpose of the survey was to measure road traffic noise. The report presented the results of road traffic noise modelling and provided an assessment of the suitability of the site for development.

6.45 It is noted that the forecasted traffic flow from the proposed quarry at Lea Castle Farm was included with the assessment of road traffic noise for this site.

6.46 No background ($L_{A90,T}$) noise levels were presented in the report.

6.47 There was no mention or consideration of construction noise within the noise report submitted with the application. However noise from construction is considered within the Health Impact Assessment Checklist Matrix (dated April 2022) submitted with the application. Under Section 3 of the Planning Checklist, within the section on Construction, it is stated:

"*Noise and vibration disruption due to construction will be temporary and limited to the Wider Site and surrounding area and dependent on the rate of annual dwelling completions, likely to be for approximately 10 years. Construction activities would also move around the Wider Site as the Scheme is built out and are only likely to be in close proximity to noise sensitive receptors for short durations. A range of best practice environmental measures would be incorporated into the Proposed Scheme via the CEMP in order to minimise and manage potential construction noise effects, with which contractors will need to comply. Construction hours can also be controlled through a CEMP to decrease period of noise disturbance*."

6.48 Although there was a noise report submitted with the application, no background noise levels were presented in the report. It is envisaged that The A449 Wolverhampton Road would be the main source of environmental noise affecting the proposed residential site. Some of the proposed houses are to be located between the proposed development at Former Lea Castle Centre site and Wolverhampton Road, with some properties adjacent to this road.

6.49 It is assumed that the baseline noise levels at the proposed housing would be similar to those measured by WBM at Location 7 (Castle Barns), which is around 150 metres from Wolverhampton Road. The average background noise level at Castle Barns, measured in 2018 using the installed meter was 41 dB $L_{A90,T}$. Using guidance in PPGM, this indicates that 51 dB $L_{Aeq,1h}$ would be an appropriate site noise limit for these properties.

6.50 The calculated site noise level for normal, day to day operations is 46 dB $L_{Aeq,1h}$ for the housing at the Lea Castle Village. This complies with the suggested PPGM site noise limit of 51 dB $L_{Aeq,1h}$ at this location.

6.51 The calculated noise due to temporary operations is 50 dB $L_{Aeq,1h}$. This is well below the PPGM noise limit of 70 dB $L_{Aeq,1h}$ for such activities.

6.52 As such, operations at the proposed quarry at Lea Castle Farm would not cause any significant impact at the proposed residential development at the Lea Castle Village site.

Summary of Impact on Allocated Development

6.53 A summary of the assumed background levels, suggested site noise limits and 'reasonable worst case' calculated site noise levels for the allocated development sites, is presented in Table 3.

Table 3: Summary of Suggested Site Noise Limits and Calculated Site Noise Levels at Allocated Development Sites

Receptor	Assumed Background dB $L_{A90,T}$	Suggested Site Noise Limit dB $L_{Aeq,1h}$	Calculated Site Noise Level dB $L_{Aeq,1h}$
Former Lea Castle Centre (17/0205/OUTL)	39	49	39
Stourbridge Road (18/0163/FULL)	44	54	37
Four bungalows on Brown Westhead Park (20/0217/FUL)	36	46	45
Four residential dwellings at Wolverley Lodge (22/0235/PIP)	36	46	43
Lea Castle Village (22/0404/OUT)	41	51	46

6.54 The calculated noise levels associated with temporary operations are all well below the PPGM limit of 70 dB $L_{Aeq,1h}$ for such activities.

6.55 All of the calculated site noise levels comply with the site noise limits for normal and temporary operations for these additional receptors.

7 Consideration of Cumulative Impact

7.1 In the Statement of Common Ground and the Statement of Case from WCC, cumulative impact is mentioned, in particular with regard to Lea Castle Village, although the particular noise aspect of cumulative impact is not specified.

Minerals Operations

7.2 With regard to cumulative impact from mineral sites, there are no other mineral sites or operations in the vicinity of the proposed quarry at Lea Castle Farm, so no cumulative assessment of such operations is necessary.

Road Traffic

7.3 When the Lea Castle Farm quarry application was made, the additional traffic generated by the allocated developments at the time, Former Lea Castle Centre (17/0205/OUTL) and Stourbridge Road (18/0163/FULL), were included in the transport assessment prepared for the quarry application.

7.4 It is noted that the forecasted traffic flow from the proposed quarry at Lea Castle Farm was included within the assessment of road traffic noise for Lea Castle Village, as set out in the noise assessment report submitted with that application.

Operational Noise

7.5 The proposed developments are mainly housing, which usually does not generate any significant levels of noise. There are areas of employment use within the proposed development at the Former Lea Castle Centre and Lea Castle Village, however the noise levels from these are likely to be restricted in order not to cause impact on the immediately adjacent residential properties within the same development. As such the cumulative impact on other receptors from the employment use within these sites is expected to be negligible.

Construction Noise

7.6 The noise from construction, in particular of the Lea Castle Village site, is likely to be the most significant noise source associated with other developments that may have an impact on the noise sensitive receptors.

7.7 The Former Lea Castle Centre is already under construction, and construction is complete on the developments at Stourbridge Road and Brown Westhead Park. The development at Wolverley Lodge is small (four dwellings) so is unlikely to generate any significant levels of construction noise.

7.8 There is insufficient information available to determine the levels of construction noise from the Lea Castle Village site. The CEMP required for the Former Lea Castle Centre was not uploaded to the Wyre Valley District Council planning portal and no construction noise information was provided in the application for the Lea Castle Village site.

7.9 Construction noise is highly variable depending on the particular activity, the plant items used, the duration of the works at each location, the mode of operation etc. The only appropriate assumption that can be made is that it would be expected that construction noise would meet appropriate noise limits at the nearest noise sensitive receptors (dwellings) to the construction site.

7.10 As confirmed by the Health Impact Assessment Matrix submitted with the application for the Lea Castle Village site (see paragraph 6.47), any disruption from construction noise will be temporary and will generally be limited to the wider site and surrounding area. The period of construction is expected to be around 10 years. Construction activities are variable and will move around the site, and are only likely to be in close proximity to any noise sensitive receptors for relatively short durations.

7.11 There are no mandatory limits for construction noise, although there are recommendations and guidelines for limits.

7.12 BS 5228-1:2009+A1:2014 "*Code of practice for noise and vibration control on construction and open sites – Part 1: Noise*" provides some example criteria for the assessment of potential significance of construction noise effects in Annex E of the standard. One of the examples provided is the "ABC" Method, which sets threshold values for construction noise during the day, evening and night-time based on the current noise levels without construction activities. Another method compares the total noise including construction activities with the pre-construction levels. However both approaches have the same lower construction noise limit of 65 dB $L_{Aeq,T}$ during the day between 7am and 7pm.

7.13 The Worcestershire Regulatory Services (WRS) document "Code of Best Practice for Demolition and Construction Sites" September 2020 also provides recommendations for construction noise limits and includes the following text within the "Noise Limits " section:

"*Level limits of 75 dBA for a working day over a 10-hour period are recommended as a general rule in urban areas next to busy roads and in semi rural areas a level of 70dBA. WRS expects noise controls employed to meet or reduce the average noise from the site to this level. In built up environment this is not always attainable, in which case best practicable means must be applied to reduce noise and vibration as much as possible. As a guide, typical daytime levels for noisy temporary works at neighbouring premises usually lie in the range of 70 – 80 dBA*

Noise levels within neighbouring offices or residences during noisy periods must enable workers to carry out conversations, both face-to-face and on the telephone, and allow normal business to be conducted. It is considered that a noise level of 65 dBA is likely to cause annoyance and interference (dependent on the type of noise). Such noise should be restricted to hours outside the normal working day of 09.00 –17.00 hours.

In residential areas, timing of works with noise levels exceeding 65dBA should be discussed and agreed with WRS prior to commencing."

7.14 From BS 5228 and WRS guidelines, it appears that 65 dB $L_{Aeq,T}$ could be considered as a conservative daytime noise limit for construction noise. Note that this is higher than the maximum limit usually considered for mineral sites during the day (55 dB $L_{Aeq,1h}$). The suggested site noise limit for the receptors considered in WBM's quarry noise assessment in 2019 ranged from 45-55 dB $L_{Aeq,1h}$ and the suggested site noise limits for the additional receptors considered in this proof range from 46-54 dB $L_{Aeq,1h}$. As the site noise limit for normal, day to day operations at the quarry is no more than 55 dB $L_{Aeq,1h}$ at any receptor and the site noise calculations show that the limits will be complied with, quarry site noise levels at the nearest receptors to the Lea Castle Village development will be at least 10 dB(A) below the maximum potential noise from the construction activity on the housing developments. Site noise from the quarry is therefore likely to be inaudible compared to construction noise.

7.15 The nearest existing residential areas to the Former Lea Castle Centre and Lea Castle Village sites include:

- Castle Road
- Lea Castle Drive / The Crescent
- Axborough Lane
- Park Gate Road
- Isolated farm dwellings to the south of Stourbridge Road
- Castle Barns – located between 50-175 metres to the west of Wolverhampton Road

7.16 In additional there will be new dwellings within the Former Lea Castle Centre site and the Lea Castle Village site that will be completed as ongoing construction occurs in other parts of the site.

7.17 The quarry noise assessment considered the impact of quarry site noise on Castle Barns. For this receptor, the calculated, worst case site noise level for normal quarry operations is 48 dB $L_{Aeq,1h}$. This noise level is well below the possible construction noise limit of 65 dB $L_{Aeq,T}$. This indicates that the site noise from the quarry would be insignificant compared to the potential construction noise from the housing development. As such, the inclusion of site noise from the quarry would not change the cumulative noise impact at this receptor, as the noise environment would be controlled by construction noise.

7.18 Within this proof, the quarry site noise has also been considered at the nearest proposed dwellings within the Former Lea Castle Centre and the Lea Castle Village sites. For the dwellings in the Former Lea Castle Centre and Lea Castle Village sites, as indicated in Section 7, the calculated worst case site noise levels from normal quarry operations are 37 dB $L_{Aeq,1h}$ and 46 dB $L_{Aeq,1h}$ respectively. These noise levels are also well below the possible construction noise limit of 65 dB $L_{Aeq,T.}$ This indicates that the site noise from the quarry would be insignificant compared to the potential construction noise from the housing development. As above, the inclusion of site noise from the quarry would not change the cumulative noise impact at these receptors, as the noise environment would be controlled by construction noise.

7.19 As indicated above in paragraphs 7.9 and 7.10, construction noise will be variable and temporary, and only likely to be in close proximity to any noise sensitive receptors for relatively short durations. As such it is expected that the construction activity would only be up to the construction noise limit for a short period of time when works were near the particular receptor. Also as indicated above (see paragraphs 5.4) the calculated site noise level due to the quarry is a worst case with simultaneous extraction and infilling operations occurring at the nearest parts of the quarry to the receptor, which would not happen in practice.

7.20 Taking this into account, the cumulative impact from both normal site activities from the quarry and construction operations is unlikely to be significant at any receptor.

7.21 Concern has been raised by WCC about the cumulative impact on Heathfield Knoll School and the nursery. These are located approximately 1 kilometre from the Lea Castle Village site. At this distance, any construction noise from the Lea Castle site is highly unlikely to be significant at the school and nursery, and as such would not change the impact assessment of quarry noise affecting this receptor.

8 Response to WCC Statement of Case

Impact on an allocated development

8.1 For the noise assessment prepared for the proposed quarry at Lea Castle Farm, WBM included the receptors nearest to the site that were considered to have the potential for being subject to the most noise impact.

8.2 At the time that WBM prepared the noise assessment for the proposed quarry in September 2019, there were two housing developments in the vicinity that had planning approval but these developments were further from the proposed quarry site than the noise sensitive receptors included in the WBM noise assessment. Additional residential properties/developments in the area have subsequently been permitted or have had applications submitted.

8.3 The impact of noise from the proposed quarry on all of these receptors has been considered in this proof. The calculated site noise levels for the reasonable worst case normal operations and short term temporary operations have all met appropriate noise limits based on the advice in PPGM.

8.4 As such, operations at the proposed quarry at Lea Castle Farm would not cause any significant impact at the permitted and proposed residential developments.

Cumulative Impact on Residential Receptors

8.5 With regard to cumulative impact from mineral sites, there are no other mineral sites or operations in the vicinity of the proposed quarry at Lea Castle Farm, so no cumulative assessment of such operations is necessary.

8.6 With regard to road traffic, the additional traffic generated by the allocated developments at the time were presented in the transport assessment prepared for the quarry application.

8.7 The forecast traffic flow from the proposed quarry at Lea Castle Farm was included within the assessment of road traffic noise for Lea Castle Village as set out in the noise assessment report submitted with the application. Therefore the cumulative impact of additional traffic from the proposed quarry has already been considered in the noise assessment for the Lea Castle Farm site.

8.8 The cumulative impact with regard to construction activities on the permitted and proposed housing developments has been considered in general terms. Construction noise is highly variable depending on the particular activity, location of the works, the plant items used, the duration of the works at each location and the mode of operation. The Health Impact Assessment Matrix submitted with the application for the Lea Castle Village site confirmed that any disruption from construction noise will be temporary and will generally be limited to the wider site and surrounding area, and are only likely to be in close proximity to any noise sensitive receptors for relatively short durations. The only appropriate assumption that can be made is that it would be expected that construction noise would meet appropriate noise limits at the nearest noise sensitive receptors (dwellings) to the construction site. From BS 5228 and WRS guidelines, it appears that 65 dB $L_{Aeq,T}$ could be considered as a conservative daytime noise limit for construction noise.

8.9 The receptors that could be exposed to both noise from the quarry site and construction activity from Lea Castle Village have been identified as those at Castle Barns, and the new dwellings within the Former Lea Castle Centre and the Lea Castle Village sites. For all these sites, the calculated worst case site noise levels from normal quarry operations are well below the possible construction noise limit of 65 dB $L_{Aeq,T.}$ As the site noise limit for normal, day to day operations at the quarry is no more than 55 dB $L_{Aeq,1h}$ at any receptor and the site noise calculations show that the limits will be complied with, quarry site noise levels at the nearest receptors to the Lea Castle Village development will be at least 10 dB(A) below the maximum potential noise from the construction activity on the housing developments. Site noise from the quarry is therefore likely to be inaudible compared to construction noise.

8.10 The quarry site noise would be insignificant compared to the potential construction noise from the housing development. The inclusion of site noise from the quarry would not change the cumulative noise impact at these receptors, as the noise environment would be controlled by construction noise.

8.11 As indicated above construction noise will be variable and temporary, and only likely to be in close proximity to any noise sensitive receptors for relatively short durations. As such it is expected that the construction activity would only be up to the construction noise limit for a short period of time when works were near the particular receptor, if at all. Also as indicated above, the calculated site noise level due to the quarry is a worst case with simultaneous extraction and infilling operations occurring at the nearest parts of the quarry to the receptor, which would not happen in practice. Taking this into account, the cumulative impact from both normal site activities from the quarry and construction operations is unlikely to be significant at any residential receptor.

8.12 As such, the consideration of cumulative impact does not alter the outcome of the original noise assessment of the site.

Cumulative Impact on Heathfield Knoll School and Nursery

8.13 Heathfield Knoll School and Nursery are located on Heathfield Lane, approximately 1 kilometre from the Lea Castle Village site. At this distance, any construction noise from the Lea Castle site would be insignificant and is likely to be inaudible at the school and nursery, and as such would not change the impact assessment of quarry noise affecting this receptor.

Identifiable Noise

8.14 Paragraph 5.8 of the WCC statement of case indicates that occasional identifiable noise being heard from the quarry in combination with other environmental impacts will be demonstrated by them as offering cumulative harm to amenity.

8.15 The guidance documents relating to noise generally require noise not to have unacceptable adverse impacts and to avoid significant adverse impact.

8.16 The Noise Exposure Hierarchy from PPGN (see Table 1 of this document) confirms that the that “No Observed Adverse Effect Level” (NOAEL) correspond to noise being heard but does not cause any change in behaviour etc.

8.17 The “Lowest Observed Adverse Effect Level” (LOAEL) corresponds to noise being heard and causing small changes in behaviour etc.

8.18 The “Significant Observed Adverse Effect Level” (SOAEL) corresponds to noise causing a material change in behaviour.

8.19 Note that where the impact lies between LOAEL and SOAEL, the NPSE advises that this does not mean that such adverse effects cannot occur.

8.20 The fact that sound may occasionally be heard does not result in significant adverse impact; “*occasional identifiable noise being heard*” could occur for both NOAEL and LOAEL scenarios, neither of which result in significant adverse impact.

8.21 It is considered that compliance with the noise limits specified within the PPGM should be sufficient to avoid significant adverse impact. The calculations for the reasonable worst case for normal operations at the quarry demonstrates that these limits are achieved for all receptors, and the inclusion of the cumulative impact of construction noise does not affect this outcome. In addition, the calculated site noise levels for the quarry are a worst case assuming that all plant on site operates simultaneously in the closest likely working areas to each receiver location for both extraction and infilling. In practice, these two activities would be taking place in different phases of the development and the quarry site noise levels would generally be lower the worst case calculated levels.

9 Response to Rule 6 Party Statement of Case

9.1 The Rule 6 party (Stop the Quarry Campaign) have raised concerns about noise but have not provided any details.

9.2 The noise assessment prepared by WBM in September 2019 followed appropriate protocols by determining the baseline noise levels at the nearest receptors using robust methods, including measurements on several days.

9.3 The average background noise levels determined from the baseline noise surveys were used to determine appropriate site noise limits following current Government policy and guidelines, i.e. the advice in PPGM.

9.4 Site noise calculations were undertaken, with WBM providing feedback to NRS on the scheme with regard to the mitigation required to ensure that appropriate noise levels were met for the reasonable worst case scenarios.

9.5 The receptors considered included the nearest residential properties and also the Heathfield Knoll School and Nursery.

9.6 Within this proof I have responded to comments from WCC regarding various issues including the consideration of cumulative impact and shown that this does not affect the outcome of the original noise assessment. This reasoning should also be sufficient to respond to the Rule 6 Party concerns regarding noise.

10 Summary and Conclusions

10.1 This proof of evidence has addressed the reasons for the refusal relating to noise of the planning application for a proposed quarry at land at Lea Castle Farm, Wolverley Road, Broadwaters, Kidderminster, Worcestershire

10.2 Summaries of relevant guidance documents relating to noise and mineral sites are presented in this document. These generally show that the aim for noise is to avoid significant adverse impacts.

10.3 A summary of the baseline noise results, suggested site noise limits and calculated site noise levels from the previous noise assessment undertaken by WBM in 2019 is presented in this document. These include the noise levels at the nearest noise sensitive receptors to the proposed quarry site. As set out in the Statement of Common Ground, WCC confirmed that WRS were satisfied that the previous calculated noise levels in the report prepared by WBM were robust, albeit in isolation.

10.4 In response to comments from WCC, the results of calculations for additional noise sensitive receptors, specifically either permitted or allocated developments, have been included in this proof. The same calculation model as used for the quarry noise assessment undertaken by WBM in 2019 has been used for these additional receptors. All of the calculated site noise levels comply with the suggested site noise limits for normal and temporary quarry operations for these additional receptors. Operations at the proposed quarry at Lea Castle Farm would not cause any significant impact at the permitted and proposed residential developments.

10.5 Cumulative impact has been addressed, with noise from construction activities at the Lea Castle Village site considered to be the most significant noise source associated with other developments that may have an impact on the noise sensitive receptors.

10.6 If construction noise was at the possible maximum limit at a noise sensitive receptor, noise from the quarry would be insignificant compared to the potential construction noise from the housing development. As such, the addition of site noise from the quarry would not change the cumulative noise impact at this receptor, as the noise environment would be controlled by construction noise.

10.7 Construction noise will be variable and temporary, and only likely to be in close proximity to any noise sensitive receptors for relatively short durations. In addition, the calculated site noise levels due to the quarry are worst cases, assuming simultaneous extraction and infilling operations occurring at the nearest parts of the quarry to the receptor, which would not happen in practice. Taking this into account, the cumulative impact from both normal site activities from the quarry and construction operations is unlikely to be significant at any receptor.

10.8 As such, the consideration of cumulative impact does not alter the outcome of the original noise assessment of the site.

10.9 With regard to cumulative impact on Heathfield Knoll School and Nursery, these are located approximately 1 kilometre from the Lea Castle Village site. At this distance, any construction noise from the Lea Castle site would be insignificant and is likely to be inaudible at the school and nursery, and as such would not change the impact assessment of quarry noise affecting this receptor.

10.10 In summary, I have responded to the various comments on noise including the consideration of cumulative impact and shown that this does not affect the outcome of the original noise assessment.

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Appendix A: Glossary of Acoustic Terms

General Noise and Acoustics

The following section describes some of the parameters that are used to quantify noise.

Decibels dB

Noise levels are measured in decibels. The decibel is the logarithmic ratio of the sound pressure to a reference pressure ($2x10^{-5}$ Pascals). The decibel scale gives a reasonable approximation to the human perception of relative loudness. In terms of human hearing, audible sounds range from the threshold of hearing (0 dB) to the threshold of pain (140 dB).

A-weighted Decibels dB(A)

The 'A'-weighting filter emulates human hearing response for low levels of sound. The filter network is incorporated electronically into sound level meters. Sound pressure levels measured using an 'A'-weighting filter have units of dB(A) which is a single figure value to represent the overall noise level for the entire frequency range.

A change of 3 dB(A) is the smallest change in noise level that is perceptible under normal listening conditions. A change of 10 dB(A) corresponds to a doubling or halving of loudness of the sound. The background noise level in a quiet bedroom may be around 20 –30 dB(A); normal speech conversation around 60 dB(A) at 1 m; noise from a very busy road around 70-80 dB(A) at 10m; the level near a pneumatic drill around 100 dB(A).

Equivalent Continuous Sound Pressure Level $L_{Aeq,T}$

The 'A'-weighted equivalent continuous sound pressure level $L_{Aeq,T}$, is a notional steady level which has the same acoustic energy as the actual fluctuating noise over the same time period T. The $L_{Aeq,T}$ unit is dominated by higher noise levels, for example, the $L_{Aeq,T}$ average of two equal time periods at, for example, 70 dB(A) and 50 dB(A) is not 60 dB(A) but 67 dB(A).

The $L_{Aeq,}$ is the chosen unit of BS 7445-1:2003 "Description and Measurement of Environmental noise".

Maximum Sound Pressure Level L_{Amax}

The L_{Amax} value describes the overall maximum 'A'-weighted sound pressure level over the measurement interval. Maximum levels are measured with either a fast or slow time weighted, denoted as $L_{Amax,f}$ or $L_{Amax,s}$ respectively.

Statistical Parameters L_N

In order to cover the time variability aspects, noise can be analysed into various statistical parameters, i.e. the sound level which is exceeded for N% of the time. The most commonly used are the $L_{A10,T}$ and the $L_{A90,T}$.

$L_{A10,T}$ is the 'A'-weighted level exceeded for 10% of the time interval T and is often used to describe road traffic noise. It gives an indication of the upper level of a fluctuating noise signal. For high volumes of continuous traffic, the $L_{A10,T}$ unit is typically 2–3 dB(A) above the $L_{Aeq,T}$ value over the same period.

$L_{A90,T}$ is the 'A'-weighted level exceeded for 90% of the time interval T, and is often used to describe the underlying background noise level.