



Noise Assessment

**Proposed Mineral
Extraction and
Restoration,
Land off Bourbles Lane,
Preesall,
Lancashire**





**GREENFIELD
ENVIRONMENTAL**

**R23.11291/2/AP
Date of Report: 20 March 2023**

REPORT DETAILS

Client	Greenfield Environmental
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QUALITY ASSURANCE

Issue No.	Issue Date	Author	Technical Review
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NON-TECHNICAL SUMMARY

1. The Baxter Group are seeking planning permission for a new sand and gravel quarry on land off Bourbles Lane near Preesall in Lancashire. Vibrock Limited has been commissioned to conduct a noise impact assessment of the proposals.
2. As part of the assessment, existing noise levels have been measured at locations chosen to represent noise-sensitive premises in the vicinity of the proposed site. This information has been used to establish the baseline conditions.
3. Predicted noise levels from proposed operations have been calculated at nearby noise-sensitive premises. These predictions are based on detailed information regarding the proposed working of the site and have been undertaken following calculation methods that are suitable for open sites such as quarries.
4. The proposed development has been assessed with reference to current policy and guidance relating to noise emissions from mineral sites.
5. The outcome of the assessment demonstrates that the proposed scheme is able to operate in accordance with the recommended noise limits and there are not considered to be any significant or unacceptable adverse impacts. A range of recommendations have been made to minimise potential noise emissions from the site during the implementation of the proposed scheme.

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1.0 INTRODUCTION

1.1 Overview

- 1.1.1 Vibrock Limited is commissioned to undertake a noise impact assessment in relation to a planning application for mineral extraction and restoration at Bourbles Farm in Lancashire.
- 1.1.2 This study benefits from a site inspection and sound level monitoring undertaken in October 2021. An assessment of the potential impact of the proposals at the identified noise-sensitive premises within the vicinity of the proposed application area has been made by comparison of predicted site noise levels with relevant policy and guidance. Where necessary suitable mitigation measures have been recommended.
- 1.1.3 Further explanation of the acoustic terminology used within this report is provided in Appendix 1.

1.2 Proposals

- 1.2.1 A plan showing the application site is provided in Figure 1.
- 1.2.2 It is proposed that approximately 460,000 tonnes of sand and gravel will be extracted on a “campaign basis” (likely 2 per year) and stockpiled ensuring that processing plant has access to as-raised material over a full 12-month period. Inert waste recycling is also proposed alongside mineral processing.
- 1.2.3 The proposed quarry will be worked in a phased manner across 5 phases and progressively restored via backfilling with overburden or imported inert materials. It is anticipated that each phase will be completed in around 12 – 18 months with overall mineral extraction and restoration operations likely to take around 5 to 6 years to complete.
- 1.2.4 The development is anticipated to result in up to 100 HGV movements (50 in and 50 out) per day.

1.3 Pre-Application Process

- 1.3.1 A Screening Opinion provided by Lancashire County Council in August 2022 confirmed the proposed development is EIA Development for the purposes of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017.
- 1.3.2 A Scoping Opinion Request was submitted to the Mineral Planning Authority (Lancashire County Council) in June 2022. The response to the request provided in August 2022 highlighted the requirement for a noise impact assessment to be included within the Environmental Statement.

2.0 NOISE POLICY AND GUIDANCE

2.1 National Planning Policy and Guidance

Noise Policy Statement for England (NPSE)

2.1.1 The NPSE sets out the Government's policy on noise and includes the long-term vision of promoting good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

2.1.2 This long-term vision is supported by the following 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.

2.1.3 There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:

- NOEL (No Observed Effect Level) – this is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.
- LOAEL (Lowest Observed Adverse Effect Level) – this is the level above which adverse effects on health and quality of life can be detected.

2.1.4 Extending these concepts further, NPSE leads to the concept of a significant observed adverse effect level:

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

2.1.5 NPSE acknowledges that it is not possible to have a single objective noise-based measure that defines NOEL, LOAEL and SOAEL that is applicable to all sources of noise in all situations. It is therefore suggested that more specific advice from other applicable noise standards and guidance could be employed to determine suitable noise level criteria within the overall principles of the NPSE.

National Planning Policy Framework (NPPF)

- 2.1.6 The NPPF was first published on 27 March 2012 and updated on 24 July 2018, 19 February 2019 and 20 July 2021. This framework sets out the government’s planning policies for England and how these are expected to be applied.
- 2.1.7 Where issues of noise impact are concerned the NPPF provides brief guidance in Chapter 15 ‘*Conserving and enhancing the natural environment*’ as follows:

Paragraph 174:

Planning policies and decisions should contribute to and enhance the natural and local environment by 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.

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

Paragraph 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.

2.1.8 Specifically in relation to mineral sites, the NPPF provides guidance in Chapter 17 ‘Facilitating the sustainable use of minerals’ as follows:

Paragraph 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.

Paragraph 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;
- 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 extraction; 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.

Paragraph 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;
- d) not grant planning permission for peat extraction from new or extended sites;
- e) provide for restoration and aftercare at the earliest opportunity, to be carried out to high environmental standards, through the application of appropriate conditions. Bonds or other financial guarantees to underpin planning conditions should only be sought in exceptional circumstances;
- f) consider how to meet any demand for small-scale extraction of building stone at, or close to, relic quarries needed for the repair of heritage assets, taking account of the need to protect designated sites; and
- g) recognise the small-scale nature and impact of building and roofing stone quarries, and the need for a flexible approach to the duration of planning permissions reflecting the intermittent or low rate of working at many sites.

Planning Practice Guidance (PPG)

- 2.1.9 PPG is written in support of the NPPF and provides an increased level of specific planning guidance.
- 2.1.10 PPG-Noise states that noise needs to be considered when new development may create additional noise or would be sensitive to the prevailing acoustic environment (including any anticipated changes to that environment from activities that are permitted but not yet commenced). Where justified, noise can override other planning concerns, although it is important to look at noise in the context of the wider characteristics of a development proposal, its likely users and its surroundings, as these can have an important effect on whether noise is likely to pose a concern.
- 2.1.11 Plan-making and decision taking need to take account of the acoustic environment and in doing so consider:
- whether or not a significant adverse effect is occurring or likely to occur;
 - whether or not an adverse effect is occurring or likely to occur;
 - and
 - whether or not a good standard of amenity can be achieved.
- 2.1.12 In line with the Explanatory note of the NPSE this would include identifying whether the overall effect of the noise exposure would be above or below the significant observed adverse effect level (SOAEL) and the lowest observed adverse effect level (LOAEL) for the given situation.
- 2.1.13 When noise is not perceived to be present, there is by definition no effect. As the noise exposure increases, it will cross the 'No Observed Effect Level'. However, the noise has no adverse effect so long as the exposure does not cause any change in behaviour, attitude or other physiological responses of those affected by it.
- 2.1.14 As the exposure increases further, it crosses the LOAEL boundary above which the noise starts to cause small changes in behaviour and attitude and consideration needs to be given to mitigating and minimising those effects (taking account of the economic and social benefits being derived from the activity causing the noise).
- 2.1.15 Increasing noise exposure will at some point cause the SOAEL boundary to be crossed. Above this level the noise causes a material change in behaviour. If the exposure is predicted to be above this level the planning process should be used to avoid, but not necessarily prevent, this effect occurring, for example through use of appropriate mitigation such as by altering the design and layout.

2.1.16 The table below summarises the noise exposure hierarchy from PPG-Noise.

Table 1: Noise Exposure Hierarchy

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
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

2.1.17 In relation to noise from mineral extraction operations, PPG-Noise makes reference to National Planning Practice Guidance for minerals which is outlined overleaf.

2.1.18 The supporting ‘Minerals’ PPG is the current Government advice applicable to the control of noise from surface mineral workings in England and recognises that planning for the supply of minerals has a number of special characteristics that are not present in other development.

2.1.19 It includes the following appropriate noise standards 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 ($L_{A90,1h}$) 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) $L_{Aeq,1h}$ (free field). For operations during the evening (1900-2200) the noise limits should not exceed the background noise level ($L_{A90,1h}$) by more than 10dB(A) and should not exceed 55dB(A) $L_{Aeq,1h}$ (free field). For any operations during the period 2200 – 0700 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) $L_{Aeq,1h}$ (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 (e.g. L_{max} 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.”

2.1.20 The same document includes instances where particularly noisy short-term activities may occur and the appropriate criteria for such circumstances;

“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) $L_{Aeq,1h}$ (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) $L_{Aeq,1h}$ (free field) limit referred to above should be regarded as the normal maximum”.

2.2 Local Planning Policy

Joint Lancashire Minerals and Waste Development Framework Core Strategy DPD

Achieving Sustainable Minerals Production - POLICY CS5

Alternatives to the bulk transportation of minerals by road will be encouraged. Existing or potential transport, storage, handling or reprocessing facilities will be safeguarded where they offer the potential for the use of rail, water or other means to transport minerals.

Criteria will be developed for the site identification process, and also for considering other proposals brought forward outside the plan-making process, to ensure that:

- (i) our natural resources including water, air, soil and biodiversity are protected from harm and opportunities are taken to enhance them;*
- (ii) features and landscapes of historic and cultural importance and their settings are protected from harm and opportunities are taken to enhance them;*
- (iii) workings will not adversely contribute to fluvial flood risks or surface water flooding;*
- (iv) proposals for mineral workings incorporate measures to conserve, enhance and protect the character of Lancashire's landscapes;*
- (v) the amenity, health, economic well-being and safety of the population are protected by the introduction of high operating standards, sensitive working practices and environmental management systems that minimise harm and nuisance to the environment and local communities throughout the life of the development;*
- (vi) essential infrastructure and services to the public will be protected;*
- (vii) sensitive environmental restoration and aftercare of sites takes place, appropriate to the landscape character of the locality and the delivery of national and local biodiversity action plans. Where appropriate, this will include improvements to public access to the former workings to realise their amenity value.*

Concurrent mineral working will be encouraged where it will maximise the recovery of the materials worked, including secondary materials.

Waste materials will be used positively wherever appropriate and will not constitute a nuisance before a suitable use can be found.

Joint Lancashire Minerals and Waste Local Plan. Site Allocation and Development Management Policies - Part One

Policy DM2 - Development Management

Development for minerals or waste management operations will be supported where it can be demonstrated to the satisfaction of the mineral and waste planning authority, by the provision of appropriate information, that all material, social, economic or environmental impacts that would cause demonstrable harm can be eliminated or reduced to acceptable levels. In assessing proposals account will be taken of the proposal's setting, baseline environmental conditions and neighbouring land uses, together with the extent to which its impacts can be controlled in accordance with current best practice and recognised standards.

In accordance with Policy CS5 and CS9 of the Core Strategy developments will be supported for minerals or waste developments where it can be demonstrated to the satisfaction of the mineral and waste planning authority, by the provision of appropriate information, that the proposals will, where appropriate, make a positive contribution to the:

- *Local and wider economy*
- *Historic environment*
- *Biodiversity, geodiversity and landscape character*
- *Residential amenity of those living nearby*
- *Reduction of carbon emissions*
- *Reduction in the length and number of journeys made.*

This will be achieved through for example:

- *The quality of design, layout, form, scale and appearance of buildings*
- *The control of emissions from the proposal including dust, noise, light and water*
- *Restoration within agreed time limits, to a beneficial afteruse and the management of landscaping and tree planting*
- *The control of the numbers, frequency, timing and routing of transport related to the development.*

3.0 BASELINE CONDITIONS

3.1 Survey Details

3.1.1 Measurements of the existing ambient noise level in the vicinity of the site were obtained on Wednesday 13 October 2021.

3.1.2 Fully attended measurements were made at locations selected to represent noise-sensitive premises closest to the application site.

3.1.3 The assessment locations used for the purpose of this study are shown in Figure 2.

3.2 Instrumentation

3.2.1 The following instrumentation was used during the survey:

Table 2: Noise Monitoring Equipment

Manufacturer	Type	Serial No.
Norsonic	Class 1 Precision Sound Analyser Nor140	1403165
Norsonic	Class 1 Sound Calibrator Type 1251	34488

3.2.2 During the survey the microphone was protected with suitable outdoor windshield and mounted on a tripod.

3.2.3 Measurements at all monitoring locations were 'free field' (no vertical reflective surfaces within 3.5 metres of the microphone) and at a height of between 1.2 – 1.5 metres above ground level.

3.2.4 The following set-up parameters were used on the sound level meter:

- Time Weighting: Fast
- Frequency Weighting: A
- Averaging-Integrating Period: 15 minutes

3.2.5 With the equipment set up in the configuration used during measurement, field calibration checks were performed on site immediately before and after the survey period using a sound calibrator. No significant drift (i.e. no greater than ± 0.5 dB) in the calibration value was observed between the initial and final checks.

3.3 Observations

3.3.1 The acoustic environment in the vicinity of the site predominantly comprises noise from distant and local road traffic, along with occasional aircraft movements and birdsong.

3.3.2 Weather conditions during the survey were dry and settled with average wind speeds of around $2 - 3 \text{ ms}^{-1}$ and predominantly from a west-north-westerly direction. Cloud cover varied between 7 and 8 oktas, relative humidity was in the region of 80% and the temperature was 14°C .

3.4 Results

3.4.1 The raw monitoring data is provided in Table 3 and the measured background noise levels are summarised in Table 4.

Table 3: Baseline Noise Monitoring Data

Location	Date and Start Time	Duration (T)	$L_{Aeq,T}$ dB	$L_{Amax,T}$ dB	$L_{A10,T}$ dB	$L_{A90,T}$ dB
Crossing Cottage	13/10/2021 10:46	15 min	57.2	78.9	48.6	37.8
	13/10/2021 13:19	15 min	55.4	78.1	47.3	37.6
	Average		56	79	48	38
Bourbles Farm	13/10/2021 11:09	15 min	45.3	60.0	47.4	39.2
	13/10/2021 13:43	15 min	47.1	61.0	49.1	41.3
	Average		46	61	48	40
Ouroome	13/10/2021 11:33	15 min	39.4	58.0	40.8	36.4
	13/10/2021 14:06	15 min	40.2	52.8	42.9	36.8
	Average		40	58	42	37
Woodlands / Red Lea / Little Tongues Lane	13/10/2021 11:45	15 min	44.0	61.9	45.3	40.0
	13/10/2021 14:29	15 min	43.6	54.0	45.6	39.5
	Average		44	62	45	40
The Beeches	13/10/2021 12:08	15 min	54.0	75.7	54.2	41.8
	13/10/2021 14:51	15 min	55.0	76.3	52.5	42.6
	Average		55	76	53	42
Lyndale Farm	13/10/2021 12:32	15 min	55.7	64.2	59.4	48.1
	13/10/2021 15:11	15 min	56.7	69.1	59.6	46.8
	Average		56	69	59	47
Mytax / New England Cottage	13/10/2021 12:51	15 min	46.5	60.4	47.2	42.5
	13/10/2021 15:29	15 min	46.8	62.6	47.9	42.7
	Average		46	63	48	43

Note - The background sound level (L_{A90}) at each monitoring location was determined by arithmetically averaging the disaggregated $L_{A90,15min}$ measurement data collected during the survey.

Table 4: Summary of Background Noise Levels

Monitoring Location	Background Noise Level Average L_{A90} dB
Old Nickson's Cottage	40
Whinmore Fold	40
Woodlands	40
Red Lea	40
Bourbles Farm	40
Crossing Cottage	38
Greenacres	47
Lyndale Farm	47
Mytax / New England Cottage	43
Hillfield House / Pointer Farm	42
The Beeches	42
Ourome	37

4.0 POTENTIAL NOISE EMISSIONS

4.1 Introduction

4.1.1 The level of sound in the local environs that arises from a site will depend on a number of factors. The more significant of which are:

- (a) the sound level output of the plant or equipment used on site;
- (b) the periods of operation of the plant on site;
- (c) the distance between the source noise and the receiving position;
- (d) the presence of screening due to barriers;
- (e) the reflection of sound;
- (f) soft ground attenuation.

4.1.2 Potential noise levels from the proposed development have been predicted at nearby noise-sensitive locations based on the following methodology and assumptions.

4.2 Prediction Methodology

4.2.1 The prediction method used is based upon that outlined within Annex F of BS 5228-1:2009+A1:2014 '*Code of practice for noise and vibration control on construction and open sites. Part 1: Noise*'. This guidance details methods to estimate noise from 'open sites' which can include quarries, waste disposal sites and long-term construction projects.

4.2.2 The most important elements of this standard used in the estimation of noise levels from the proposed development are distance attenuation, site activity on-time, screening, ground absorption and angle of view corrections.

4.2.3 In terms of screening BS 5228 states that as a working approximation, if there is a barrier or other topographic feature between the source and the receiving position, assume an approximate attenuation of 5 dB when the top of the plant is just visible to the receiver over the noise barrier, and of 10 dB when the noise screen completely hides the sources from the receiver. The standard recognises that these estimates can be conservative and that specifically designed and positioned noise barriers, such as soil bunds, could provide greater attenuation.

4.2.4 The ground absorption coefficient has been estimated according to the combination of soft and hard ground conditions present between the source and receiver position. 'Soft' ground is taken to refer to surfaces which are absorbent to sound, e.g. grassland, cultivated land or plantations as opposed to 'hard' ground surfaces which reflect sound such as paving, asphalt and surface water.

- 4.2.5 In accordance with BS 5228 methodology, the attenuation from screening and soft ground attenuation have not been combined (where applicable). Instead, either the attenuation from screening and hard ground propagation, or the attenuation provided by soft ground alone has been included in the calculation, whichever is the greater of the two.
- 4.2.6 Noise level predictions at each assessment location have been made to a height of 1.5 metres above ground level and at least 3.5 metres from any reflecting surface other than the ground. The predictions made are ‘free-field’ sound levels to allow for an appropriate comparison with the background sound level measurements which were also made in free-field conditions.
- 4.2.7 All noise level predictions have been calculated with the combinations of plant working at the closest point to the assessment location. The predictions are therefore worst-case scenarios which may be of relatively short duration, however, they indicate the potential highest $L_{Aeq,1h}$ noise level to which a particular property or group of properties may be exposed during the working of the site. This worst-case situation may occur intermittently over the lifetime of the site, but the longer-term noise levels perceived outside of the site boundary would normally be significantly less.

4.3 Noise Source Details

- 4.3.1 Information regarding the proposed working of the site has been based on discussions with the applicant.
- 4.3.2 A list of plant and activities from which the noise predictions have been made is presented in Table 5 along with a number of assumptions regarding activity ‘on-times’ and vehicle movements. The noise emission levels used within this assessment are based on measurements of plant and activities by Vibrock Ltd at similar sand and gravel quarry sites across the UK.

Table 5: Noise Source Details

Description of Plant/Activity	Sound Power Level dB(A)	Assumptions
Excavator loading Dump Truck	104	75% on-time
Dozer	106	25% on-time
Tipping Fill	107	10% on-time
Dump Trucks	103	16 movements/hour 20 mph
Water Bowser	109	2 movements/hour 20 mph

Description of Plant/Activity	Sound Power Level dB(A)	Assumptions
Dump Truck unloading at processing area	107	10% on-time
Dozer (as raised stockpile management)	106	10% on-time
Processing Plant + Loading	105	100% on-time
Mobile Crusher	108	50% on-time
Wheeled Loading Shovels	105	50% on-time
Excavator (recycling)	102	25% on-time
Shovel (recycling)	105	25% on-time
Tipping in Waste Transfer Area	107	10% on-time
Loading Dump Truck in Waste Transfer Area	104	25% on-time
Dewatering Pumps	92	100% on-time
Weighbridge	89	25% on-time
Diesel Generator	91	100% on-time
Wheelwash	92	25% on-time
Road Lorry	101	10 movements/hour 15 mph

5.0 ASSESSMENT

5.1 Introduction

5.1.1 Summaries of the predicted worst-case noise levels associated with the proposed scheme are shown in the tables below, together with a comparative assessment against current planning practice guidance for mineral sites.

5.2 Short-Term Operations

5.2.1 PPG permits a temporary daytime noise limit of 70 dB(A) $L_{Aeq, 1h}$ (free field) for periods of up to 8 weeks in a year to facilitate short-term activities which include essential site preparation, restoration, 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.

5.2.2 In terms of short-term operations, it is considered that some aspect of final restoration work and initial preparation works, such as soil stripping and bund formation, are likely to have the highest noise impact due to their potential occurrence at or close to the site boundary and potentially unscreened from noise-sensitive premises in the vicinity.

5.2.3 Table 6 below presents an assessment of noise from these temporary activities associated with the proposed scheme.

Table 6: Assessment of Short-Term Operations

Location	Predicted Worst Case Site Noise Level dB $L_{Aeq, 1h}$ (free-field)	Difference between Site Noise and 70 dB(A) Limit
Old Nickson's Cottage	52	-18
Whinmore Fold	57	-13
Woodlands	68	-2
Red Lea	68	-2
Bourbles Farm	67	-3
Crossing Cottage	48	-22
Greenacres	47	-23
Lyndale Farm	49	-21
Mytax / New England Cottage	68	-2
Hillfield House / Pointer Farm	54	-16
The Beeches	54	-16
Ourome	68	-2

5.2.4 The table above demonstrates that potential noise levels from short-term activities are expected to remain within the temporary daytime limit of 70 dB recommended within PPG-Minerals.

5.3 Normal Operations

5.3.1 PPG recommends a noise limit at noise-sensitive property that does not exceed the background level by more than 10 dB(A). Where this poses an unreasonable burden on the mineral operator the limit should be as near the $L_{A90} + 10$ dB(A) criteria as practicable and should not exceed 55 dB(A) $L_{Aeq,1h}$ (free field).

5.3.2 Table 7 below presents an assessment of noise from normal operations associated with the proposed scheme. The predictions include the beneficial effects of screening bunds which were designed into the scheme at an early stage to mitigate potential noise impacts. The screening bunds will be created using soils retained for restoration purposes. The location of the proposed screening is detailed within the quarry development plans.

Table 7: Assessment of Normal Operations

Location	Predicted Worst Case Site Noise Level dB $L_{Aeq,1h}$ free-field	Background Noise Level	Difference between site Noise and Background Level	Difference between Site Noise and 55 dB(A) Limit
Old Nickson's Cottage	47	40	+7	-8
Whinmore Fold	48	40	+8	-7
Woodlands	54	40	+14	-1
Red Lea	54	40	+14	-1
Bourbles Farm	53	40	+13	-2
Crossing Cottage	47	38	+9	-8
Greenacres	46	47	-1	-9
Lyndale Farm	48	47	+1	-7
Mytax / New England Cottage	52	43	+9	-3
Hillfield House / Pointer Farm	51	42	+9	-4
The Beeches	50	42	+8	-5
Ourome	47	37	+10	-8

- 5.3.3 The results of the assessment demonstrate that potential noise levels from normal site operations could exceed the background level by more than 10 dB at Woodlands, Red Lea and Bourbles Farm. However, the proposed screening bunds reduce potential noise levels to within the 55 dB limit at all assessment locations and near to the $L_{A90} + 10$ dB(A) criteria as practicable in accordance with PPG-Minerals.
- 5.3.4 The worst-case approach to the calculation of noise levels from the proposed development should be noted and in reality site activities likely to generate noise levels that are in excess of 10 dB above the background noise levels will be short-lived. Furthermore, it should also be noted that extraction operations will occur on a campaign basis meaning that there will be significant periods during the life of the scheme where only very minimal operations are occurring in the wider extraction areas.
- 5.3.5 Taking the above into consideration along with the additional implementation of a range of best-practice control measures during the working of the quarry site, the overall noise impacts are unlikely to be significant.

6.0 RECOMMENDATIONS

6.1 In addition to the proposed screening bunds and stand-off distances, the following noise control measures should be implemented during the operation of the site to demonstrate best practice and minimise the potential impact at noise-sensitive premises in the vicinity of the proposed development:

- (a) The stated operating hours of the site should be strictly adhered to. Any site working hour restrictions should be effectively communicated to all site staff and subcontractors;
- (b) All plant and equipment should comply with the relevant statutory requirements regarding noise emissions;
- (c) Audible reversing warning systems on mobile plant and vehicles should be of a type which, whilst ensuring that they give proper warning, have a minimum noise impact on persons outside sites;
- (d) All machinery should be regularly maintained and where appropriate fitted with exhaust silencers. Any defective items should not be used. Regular inspections of plant should be undertaken to identify any faults or wear and tear that may be resulting in excessive noise;
- (e) The drop heights of materials should be minimised where possible;
- (f) Plant and vehicles should be started up sequentially rather than all together. Any period of idling required to warm up mobile plant at the start of the working day should be undertaken in locations away from residential premises;
- (g) Unnecessary horn usage, sharp braking and revving of engines should be avoided;
- (h) Equipment should be switched off or throttled down to a minimum when not required. Any covers, panels or enclosure doors to engines should be kept closed when the equipment is in use;
- (i) Plant from which the noise generated is known to be particularly directional should, wherever practicable, be orientated so that the noise is directed away from noise-sensitive areas;
- (j) The site access road and internal haul routes should be kept clear and well maintained. Steep gradients should be avoided where possible;
- (k) Operatives should be trained to employ appropriate techniques to keep site noise to a minimum and should be effectively supervised to ensure that best working practice in respect of noise reduction is followed.

6.2 Prior to the commencement of operations at the site, it is also recommended that a noise management plan should be prepared and submitted to the Mineral Planning Authority for approval. This could be secured via a planning condition should the proposed quarry development be permitted.

7.0 SUMMARY

- 7.1 Vibrock Limited has been commissioned to undertake a noise impact assessment in relation to a proposed scheme of mineral extraction and restoration on land off Bourbles Lane, near Preesall in Lancashire.
- 7.2 Development plans have been studied and a series of noise level predictions have been made at noise-sensitive locations within the vicinity of the proposed application site. These potential noise levels have been assessed against relevant criteria including that outlined within Planning Practice Guidance to the National Planning Policy Framework.
- 7.3 All predictions have been calculated with the combinations of plant working at the closest point to each assessment location. They are therefore worst-case scenarios which may be of relatively short duration. However, they indicate the maximum $L_{Aeq,1h}$ (free-field) noise level to which a particular property or group of properties may be exposed during the working of the site. The worst-case situation may occur intermittently over the lifetime of the site, but longer term noise levels perceived outside of the site boundary would normally be significantly less.
- 7.4 The results of the assessment demonstrate that the proposed development can be implemented by the Operator whilst adhering to the noise standards contained within current Planning Practice Guidance for mineral sites.
- 7.5 It is therefore considered unlikely that the proposed development would result in significant or unacceptable adverse impacts at noise-sensitive premises in the vicinity of the site. A range of recommendations have been made to minimise potential noise emissions associated with the operation of the site.
- 7.6 The overall noise impact of the proposed development is therefore considered to be in line with current national and local planning policy which seeks to prevent and avoid any significant or unacceptable adverse impacts and, where necessary, mitigate and reduce to a minimum other adverse impacts.

8.0 REFERENCES

1. ANC Guidelines: *Environmental Sound Measurement Guide*. May 2021.
2. British Standard 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites. Part 1: Noise*. British Standards Institution 2014.
3. British Standard 7445-1:2003 *Description and measurement of environmental noise – Part 1 Guide to quantities and procedures*. British Standards Institution 2003.
4. *Guidelines for Environmental Noise Impact Assessment*, v1.2. Institute of Environmental Management & Assessment. November 2014.
5. National Planning Policy Framework – Ministry of Housing, Communities and Local Government. July 2021.
6. Noise Policy Statement for England. Government Department for Environment, Food and Rural Affairs. March 2010.
7. Planning Practice Guidance: Minerals – Ministry of Housing, Communities and Local Government. October 2014.
8. Planning Practice Guidance: Noise – Ministry of Housing, Communities and Local Government. July 2019.
9. *Joint Lancashire Minerals and Waste Development Framework Core Strategy DPD*. Lancashire County Council, Blackburn with Darwen Borough Council, Blackpool Council. February 2009
10. *Joint Lancashire Minerals and Waste Local Plan. Site Allocation and Development Management Policies - Part One*. Lancashire County Council, Blackburn with Darwen Borough Council, Blackpool Council. September 2013

FIGURE 1

Proposed Site

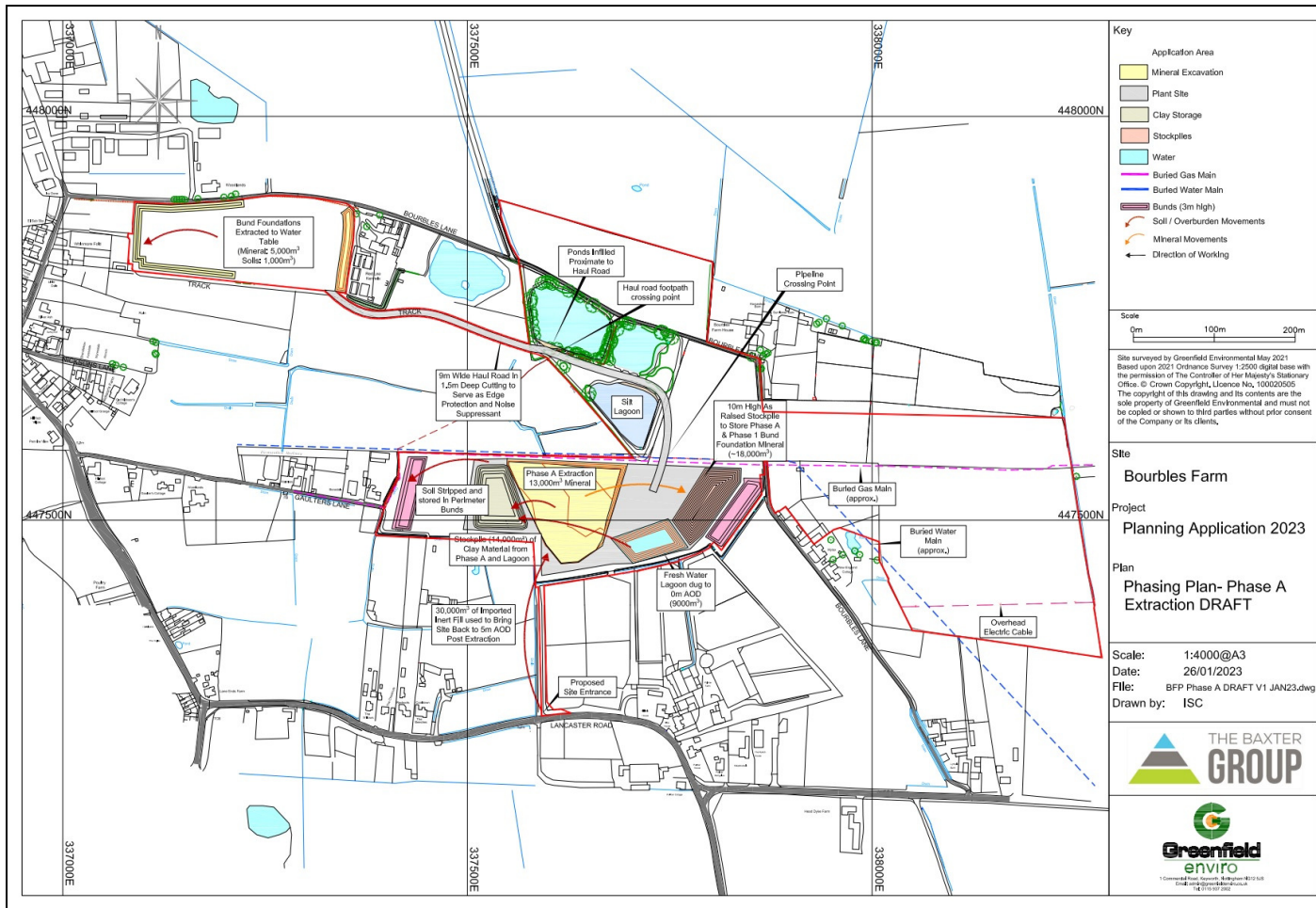
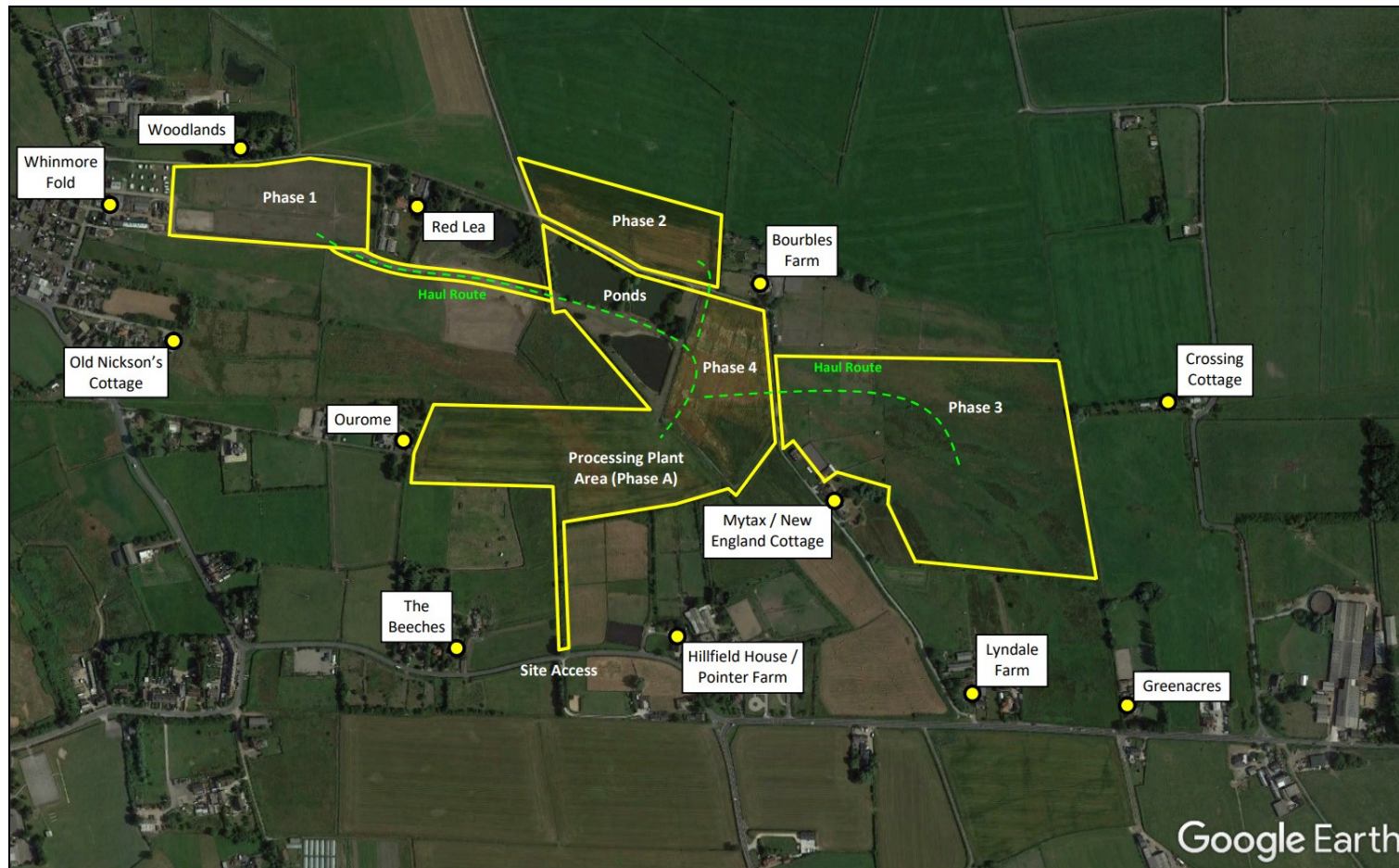


FIGURE 2

Noise-Sensitive Receptor Locations



APPENDIX 1

Acoustic Terminology and Definitions

Acoustic Environment

Sound from all sound sources as modified by the environment.

Sound Power Level (L_{WA})

The total amount of sound energy per unit of time generated by a particular sound source independent of the acoustic environment that it is in. It is a logarithmic measure of the sound power in comparison to a specified reference level.

Equivalent Continuous A-weighted Sound Pressure Level ($L_{Aeq,T}$)

Value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval T , has the same mean square sound pressure as a sound under consideration whose level varies with time.

A-weighting

A-weighting is used to replicate this sensitivity by modifying the electrical response of a sound level meter with frequency in approximately the same way as the sensitivity of the human hearing system. Measurements in dB(A) broadly agree with people's assessment of loudness.

Ambient Sound Level

Totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far. Normally expressed as the equivalent continuous A-weighted sound pressure level ($L_{Aeq,T}$).

Specific Sound Level (also referred to as 'site noise')

Sound in the neighbourhood of a site that originates from the site i.e. the sound being assessed.

Background Sound Level ($L_{A90,T}$)

A-weighted sound pressure level of the residual sound at the assessment position with no operation occurring at the proposed site. Defined in terms of the $L_{A90,T}$ which is the "A weighted" noise level exceeded for 90 per cent of the specified measurement period (T).

Free-field

External sound field in which no significant sound reflections occur (apart from the ground).

NOTE Measurements made 1.2 metres to 1.5 metres above the ground and at least 3.5 metres away from other reflecting surfaces are usually regarded as free-field.

Noise-Sensitive Premises

Any occupied premises outside a site used as a dwelling (including gardens), place of worship, educational establishment, hospital or similar institution, or any other property likely to be adversely affected by an increase in noise level.