

Technical Note

Project:	Support to Lancashire County Council Minerals Planning Authority		
Subject:	Land off 12 Bourbles Lane		
Author:	AtkinsRéalisis Air Quality & Emissions		
Date:	26/10/2023	Project No.:	5218724.002
Application number:	LCC/2023/0030		
Location:	Land off 12 Bourbles Lane		
Proposed works:	Proposed Sand and Gravel Extraction, Land off Bourbles Lane, Preesall		
Grid Ref:	OS Grid Ref: SD 37660 47681		

Document history

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
1.0	Air Quality review	JAS	SJH	SJH	VLS/AW	26/10/23

Client signoff

Client	Lancashire County Council
Project	Support to Lancashire County Council Minerals Planning Authority
Project No.	5218724.002

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1. Application Documents

On behalf of Lancashire County Council (LCC), AtkinsRéalis has reviewed the following information submitted to inform the planning application for Land off 12 Bourbles Lane, application number LCC/2023/0030:

Document
Screening Opinion SCR/2022/0004
Scoping Opinion SCP/2022/0003
Addendum to Scoping Opinion SCP/2022/0003
Bourbles Quarry Environmental Statement (ES) July 2023
Bourbles Quarry ES Non-Technical Summary
ES Appendix 10: Air Quality Assessment (27/03/23) – The Vibrock Report
Bourbles Quarry Planning Statement July 2023

2. Context

This Technical Note provides comment, drafted with regards to a technical review of the air quality assessment and associated documentation submitted with planning application LCC/2023/0030. The planning application, made by Baxter Group Ltd, is for the extraction and processing of sand and gravel including the construction of new site access roads, landscaping and screening bunds, minerals washing plant and other associated infrastructure with restoration to leisure end-uses, agricultural land and biodiversity enhancement, using imported inert fill on Land off 12 Bourbles Lane (hereafter referred to as 'the Site').

LCC provided a Screening Opinion on 9th August 2022 (Ref SCR/2022/0004), concluding

“that the key issues will depend on the scale and duration of the works and the likely consequent impact of noise, dust, discharges to water and visual intrusion”, stating that the proposed development constituted EIA development for the purposes of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017.

LCC provided a Scoping Opinion on 10th August 2022 (Ref SCP/2022/0003). In relation to 'dust' emissions associated with the proposed development LCC required that:

“Your ES should contain an assessment of dust / particulate impacts. The assessment should be based upon the methodology prescribed in paragraphs 023 – 032 of the Planning Practice Guidance. The assessment should focus on the same properties that are listed in relation to the noise topic.”

Those receptors are identified as:

- Woodlands on Bourbles / Little Tongues Lane
- Red Lea Kennels
- Bourbles Farm House, Bourbles Lane
- Mytax / New England Cottage on Bourbles Lane
- Hillfield House, Lancaster Road
- The Beeches, Lancaster Road
- Ourome, Gaulters Lane
- Old Nickson's Cottage, Nicksons Lane

LCC published an addendum to the Scoping Opinion on 22nd November 2022, requiring that the EIA:

“...should contain an analysis of the human health impacts of dust including silica rich particulates. The assessment should take into account guidance from the HSE and NHS regarding silica dust impacts including any other research into silica dust related health impacts”.

3. Review Observations

AtkinsRéalisis review focuses on the content of the Vibrock Report (Air Quality Assessment - Appendix 10 to the ES) and is undertaken chronologically as presented in the report. The review considers:

- Approach taken, standards and guidance applied;
- Inputs into the assessment and their adequacy;
- Suitability of use; and
- Findings and recommendations.

Table 4-1 identifies aspects of the assessment that do not meet expected assessment best practice, our understanding of LCC's expectations, or where further clarification is required. A note is provided where the aspect has the potential to understate air quality impacts such that the assessment conclusions may be inaccurate or overly optimistic, or where a condition may be required to ensure stated impacts are managed.

4. Summary

Key findings from the review of the Air Quality Assessment (Appendix 10 to the ES) are:

- The assessment follows appropriate guidance set out in IAQM Minerals Dust Guidance.
- The assessment has considered all human health receptors as directed by the Scoping Opinion.
- Only SSSIs have been considered as ecological receptors. Other sites with a local or national designation have not been considered, nor have the ponds on site, specifically raised by the Environment Agency.
- There are some omissions in relation to recent, relevant legislation and policy.
- Some assertions within the risk assessments are unsupported by appropriate references.
- References to historical health impacts studies relating to open cast coal mining are not considered relevant to the proposed sand and gravel extraction.
- Baseline monitoring was undertaken for a below optimum period, unsupported by contextual meteorological data meaning little weight can be assigned to this data.
- Extraction and mineral process operations will not be continuous, reducing through winter months. In addition, the extraction of mineral reserve, and subsequent restoration, will occur in phases, thus impacts from these activities will not be continual at any one receptor location for the life of the quarry. However, fixed operations for mineral processing and export will impact receptors for the full duration of the works.
- There are inconsistencies across several documents reviewed, as to whether mineral will be extracted and processed 'wet' or 'dry'. It is unclear if following dewatering, extracted mineral will still be damp. This has a bearing on the potential for dust emissions from mineral extraction, handling and processing activities.
- Description of operational activities within the report are less detailed than in other documents, such as the Planning Statement and it is unclear if all relevant activities have been considered in the dust assessment.
- There is little detail on stripping and storage of soils and what mitigation will be applied.
- Although some of the assigned magnitudes for dust risk potential are potentially underestimated, the highest magnitude, MEDIUM, is carried forward in the assessment at each identified receptor location.
- The risk assessment for respirable crystalline silica (RCS) is insufficient as it does not include robust evidence or references to relevant sources such as HSE to support the judgement that the proposed development presents no risk to the public. We provide further comment on this concern, below.
- Dust management and mitigation measures are minimal and lack sufficient detail to support a Dust Management Plan (DMP). There are uncertainties in the assessment process regarding dust risk magnitude and thus what measures are appropriate.
- Outwith the scope of the planning regime, proposed crushing and screening operations may be subject to Local Authority permitting requirements under Environmental Permitting Regulations 2016^x.
- Overall, the documents submitted by the applicant contain a number of omissions, which do not give confidence in the conclusions drawn. The applicant should address these to provide robust evidence to

support their conclusions, notably the moisture content of mineral during extraction, handling and processing operations which affects the recommendations for mitigation and monitoring.

4.1. Recommendations

While we accept the Applicant's dust risk assessment approach, we do not consider that the health risk assessment for RCS has been properly and robustly undertaken, and cannot be assured that all reasonable steps have been taken to consider, identify and minimise potential risks to human health. As a consequence we recommend objecting to this proposal pending provision of further information.

The Applicant should provide an more detailed risk assessment for potential off-site exposure to RCS, with suitable references and justification for conclusions. Effective dust control measures can interrupt the pathway between source and receptor, by reducing or removing emissions at source, and disrupting or interrupting the transport of dust emissions offsite. For this to be effective, the operator should produce a comprehensive DMP, which clearly identifies activities and methods for prevention and control of dust emissions. The DMP should clarify working methods and include procedures for monitoring, mitigation and reporting. The DMP should address the shortcomings identified in this review.

Following our review, we make the following recommendations:

Request for further information:

The applicant is requested to submit a revised risk assessment to fully comply with the requirements of the Addendum to the Scoping Opinion (dated 22/11/22) with regards to potential human health impacts from exposure to respirable crystalline silica (RCS). This should include an assessment using the IAQM source – pathway – receptor approach, that is specific to the proposals and material extraction/handling approaches. The applicant is referred to relevant guidance such as IAQM, HSE and NEPSI. The risk assessment should consider any potential adverse impacts on vulnerable groups and health inequalities.

Reason: To provide confidence to the minerals planning authority, and reassurance to the local community, that there is no significant risk of exposure to fine particulates including RCS beyond the site boundary.

Dust Management Plan:

The applicant is required to prepare a Dust Management Plan (DMP), setting out detailed measures for monitoring, management and mitigation of dust arising from operations at the proposed development. The applicant is referred to Section 7 and Appendix 6 of the IAQM Minerals Guidance on the appropriate content of a DMP. In addition to management and mitigation measures, the DMP should include proposals for the location and duration of monitoring of relevant fractions of fine particulate matter including RCS for agreement with the planning authority.

The DMP must be submitted to the Mineral Planning Authority for approval, prior to commencement of works. The DMP is a live document to support appropriate management of operations on site and should allow regular review and update in discussion with LCC. Evidence of the effectiveness of the DMP should be made available to the local planning authority and / or environmental health officer upon request.

Reason: For protection of amenity and public health

4.2. Overall Conclusions

An assessment of potential dust impacts from the quarry operations at the proposed development has been undertaken in accordance with relevant and appropriate guidance (IAQM Minerals Guidance).

There is uncertainty regarding the working methods that will be applied, with several references within the submitted planning documentation indicate dewatering and winning of 'dry' reserves creating uncertainty in what mitigation methods need to be applied. There is reference to provision of screening bunds, but no specification of location or height. These and other measures put forward should be made more specific within a DMP, to be submitted to the Minerals Planning Authority for approval prior to commencement of works. It is recommended that preparation of a DMP is secured through a planning condition.

The Vibrock report (Appendix 10 to the ES) does not, in our opinion, satisfy the requirement for assessment of human health impacts due to silica rich particles (addendum to the scoping opinion). It lacks reference to relevant guidance to support the justification that RCS would not be an issue due to wet extraction and processing. It is recommended that a commitment to monitoring once operational should be secured by condition, to determine a) RCS content in extracted material and b) potential exposure of residents to allay public fears.

Table 4-1 – Review of the Vibrock report

Item	Section	Content of the Vibrock report, Appendix 10 to the ES	AtkinsRéalisis comment
1.0 Introduction			
	1.1.3	A site inspection and monitoring was undertaken in October 2022.	This is inconsistent with details presented in paragraph 13.1.2 of the ES which states a site inspection and monitoring was undertaken in September 2019. Dust monitoring data are presented in Section 3.4 of Appendix 10 to the ES. The survey period is between 25/10/22 and 08/11/22. (see also point 3.4 below)
	1.2	A description of the site environs and receptors is provided.	There is no indication if any extant development permissions for potential sensitive receptors have been considered with regard to future impacts once the development is operational.
	1.2.2	Sensitive receptors are identified in Figure 2. <i>There is no Site of Special Scientific Interest (SSSI) within 1km of the proposed new quarry. The nearest SSSI location is Lune Estuary around over 1000m from the proposed boundary.</i>	The LCC Scoping Opinion identifies specific properties that should be included in the assessment. These are all identified on Figure 2. Identification of sensitive ecological designations appears to consider SSSIs only. There is no mention of other ecological designations, of which there are several that may be affected by dust. IAQM Minerals Guidance (2016) ⁱ requires consideration of ecological receptors up to 400m from the site. It is agreed that ecological receptors need not be considered further as our checks of MAGIC confirm there are no statutory sites within 1 km; however in their consultation response, the Environment Agency ⁱⁱ requested that the applicant provide information including: <ul style="list-style-type: none"> • <i>Details of how the on-site ditches and ponds will be protected during the works from impacts such as pollution and dust.</i> The existing ponds have not been included as a sensitive receptor.
2.0 Legislation, Policy & Guidance			
	2.1	References air quality legislation.	This section does not reference new legislation for PM _{2.5} . New PM _{2.5} targets were legislated ⁱⁱⁱ by the Government in January 2023 as a requirement of the Environment Act 2021 ^{iv} : new annual mean concentration target for PM _{2.5} of 10 µg/m ³ by 2040, with an interim target of 12 µg/m ³ by January 2028, and a population exposure reduction target. This has not been acknowledged in the report. Also omitted is legislation retaining relevant EU law for air quality limit values.

2.2	References the Air Quality Strategy (2007) and Clean Air Strategy (2019). References NPPF, July 2021.	A new Air Quality Strategy (AQS): Framework for local authority delivery in England was published in April 2023 ^v . This has not been acknowledged in the report. The AQS includes actions for local partners including “ <i>All local authorities are expected to take proactive action to improve air quality, whether or not they have an Air Quality Management Area.</i> ” This is considered applicable to this application. The NPPF was recently updated in September 2023, after the Vibrock report was published. There is no change to the content of NPPF in respect of air quality assessments.
2.4	This identifies IAQM Minerals Dust Guidance and IAQM Land-use Planning Guidance.	These guidance documents are appropriate.
2.5	This presents information on historical health impact studies.	The relevance of studies on the health effects from open cast coal mining to sand and gravel quarrying is unclear. The report does not provide sufficient information to comply with the Scoping requirement that the assessment “ <i>should contain an analysis of the human health impacts of dust including silica rich particulates.</i> ” The concern regarding the proposed development is potential exposure to elevated concentrations of RCS. HSE studies suggest that this may be of most concern in relation to those working with, and in close proximity to, materials with a high silica content e.g. quartz worktops, particularly where dry cutting is undertaken without appropriate mitigation or protection.
2.5.5	States that the HSE occupational exposure limit for dust is 10 mg/m ³ as an 8-hour time weighted average.	This is for silicon respirable dust. There is an HSE workplace exposure level (WEL) for RCS dust several orders of magnitude lower at 0.1 mg/m ³ as an 8 hour TWA (EH40/2005) ^{vi} (compared to the AQS daily mean standard for PM ₁₀ of 0.05 mg/m ³).

3.0 Baseline Conditions

3.1	Describes sensitive receptors.	The descriptors used for receptor sensitivity are appropriate. Figure 2 should include a buffer of 250m from the site boundary to support in reviewing selection of receptors in assessment.
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3.2	Describes meteorological data and provides a 10 year windrose for Blackpool Airport at Appendix 1.	The planning practice guidance that supports NPPF, cites at paragraph 25 of the Minerals section that a dust assessment study for mineral extraction should: <i>explain how climate is likely to influence patterns of dispersal by analysing data from the UK Meteorological Office or other recognised agencies on wind conditions, local rainfall and ground moisture conditions.</i> No reference is provided for the data source (Weathernet), nor is its reason for selection and relevance provided. In our opinion, ten years of wind data from Blackpool airport is appropriate assuming data are from a reliable source and subject to quality assurance.
3.2.2	Surmises that dust generating activities will be carried out within areas protected by screening bunds.	Whilst a potentially effective control measure, there is no indication of what height these bunds will be to justify this statement, considering the proposed height of stockpiled materials.
3.2.9	Describes wind speeds likely to give rise to wind blow of dust.	No references are provided for the values presented. However, in our experience, these are consistent with the threshold for initiation of “wind blow” (i.e. generation of wind blown dust) in the IAQM Minerals Guidance ^{vii} at paragraph 6.2.4. The wind speeds described by Vibrock use a wind speed unit of m/s, whereas speed data on the windrose in Appendix 1 uses knots. Consistency of units is important when appraising local conditions.
3.2.11	Presents a summary of meteorological conditions and their likely influence on potential wind blow of dust emissions	This describes the predominant wind directions only and does not consider secondary winds which could also carry dust towards receptors. It is inconsistent with the assessment in Section 5, where receptors - positioned in a number of locations around the site - are recognised as potentially being influenced by winds from various directions.
3.3	Discusses the AQMA for NO ₂ , presents PM ₁₀ background data only.	It is unclear if the scope of the air quality assessment was to consider both NO ₂ and PM ₁₀ , or just dust and particulate matter. The justification for scoping out NO ₂ emissions from development traffic is not provided until Section 7; baseline NO ₂ concentrations should be presented to allow full evaluation of existing air quality conditions. No reference is made to national (AURN) or local authority (LAQM) reporting or monitoring data. If there are no data representative of the study area, this should be clearly stated.
3.3.6	Background PM ₁₀ concentrations and risk of exceedances.	The text is supported by an appropriate reference.

3.4	Presents baseline dust monitoring data.	<p>The baseline dust monitoring survey was of just 2 weeks' duration which is not considered good practice for baseline surveys. These would usually be undertaken over a three month period comprising dryer, summer months (ref Table 5 of IAQM Minerals Guidance^{vii}). No details are provided on the weather conditions during the survey period (wind direction, rainfall) to provide context to the data.</p> <p>The sticky pad method used is acceptable. Reference to the provider of the sampling media and subsequent laboratory analysis would usually be provided. It is also usual for analysis to report both EAC and AAC, from which dust impact risk may be derived. Analysis can also derive a deposition rate for comparison with the custom and practise indicative threshold for complaints of 200 mg/m²/day.</p> <p>Little to no weight can be assigned to these findings given the above.</p>
3.4.5	Significance criteria for the effective area coverage are provided.	No reference provided to support selection of these criteria, although they are consistent with IAQM guidance on monitoring dust ^{viii} .
4.0 Potential Emissions		
4.1.1	The operations involved in the extraction, processing and movement of sand and restoration materials have the potential to generate dust emissions.	The description omits gravel as part of the mineral resource to be extracted and processed. We assume that it is.
4.2.1	A description of extraction method is provided.	<p>The description of the mineral extraction e.g. if it will be extracted wet or dry, is inadequate. These details inform the understanding of the potential for dust emissions in handling and is a key missing element.</p> <p>Other planning documents (ES para 4.2.2 and Planning Statement para 5.4.2) reference dewatering and working of the deposit in a 'dry state' whereas the ES indicated that Phase 1 of the site will involve extractions as a 'wet dig'. This raises questions on the activity.</p> <p>Further context is required on the volume and frequency of vehicle movements. It is unclear if the number of trucks is a daily figure, or just the number of vehicles operating on site at any one time.</p>
4.3.1	Describes the internal haul road.	The road construction materials described are a potential source of dust emissions as vehicles travel over them, especially if dry. A dust management plan should include appropriate mitigation, e.g. water suppression. A paved road surface should be installed for vehicles travelling between the wheel wash and site exit onto public roads.

4.3.2	Describes some dust mitigation measures to be employed.	<p>Availability and use of a water bowser to suppress dust is appropriate but measures to avoid/reduce emissions at source are also required.</p> <p>A 20 mph speed limit is considered too high and not appropriate for vehicles within the extraction area. Table 5 of the IAQM Minerals Guidance^{vii}, recommends a speed limit of 10 mph on unmade routes.</p>
4.4.1	Indicates that mineral and waste product processing will be located <i>away from residential properties</i> .	This lacks detail on the nature of the processing activities, e.g. crushing, screening, washing, the distance between this potential dust source and sensitive receptors, or the nature of screening provided to the processing area. Further detail is required to inform a dust risk assessment and the distance should be defined in a dust management plan to enable the operator to enact the measure.
4.5.1	Reference is made to the site restoration scheme for soil handling.	<p>The potential risk of dust emissions from initial soil stripping activities, prior to mineral excavation, has not been considered.</p> <p>This paragraph omits to describe how soils are stored on site or the appropriate measures to manage this potential dust source. The terms ‘handled’ and ‘managed’ are vague, and do not describe the nature of these operations, the plant involved, or duration of activities.</p>
4.6.1	Identifies potential dust source emissions	This is in line with IAQM Minerals Guidance Appendix 3 and identifies site preparation, which was omitted in Section 4.
4.6.2	Describes site preparation and restoration..	<p>Site preparation and restoration are two distinct activities, occurring at different times. Appropriate measures to address these are required.</p> <p>The Planning Statement (Section 5) includes a more detailed description of site preparation, enabling works and plant area construction, including construction of the processing plant area with imported hardcore material and road planings topped with a reinforced concrete apron, and construction of internal haul roads using compacted imported hardcore materials. The Vibrock report makes no reference to these activities and it is unclear if their appraisal of the magnitude of dust source emissions during site preparation works considers this.</p> <p>Similarly, the Vibrock report provides little detail on the soil stripping activities and no indication of the height of bunds formed from stripped soils. The Planning Statement, paragraph 5.1.5, indicates bunds of between 3m for top soil and 5m for sub soils.</p>
4.6.2 and 4.6.4	These paragraphs present two different volumes of imported restoration material; 250,000 m ³ and 1,000,000 m ³ .	The Planning Statement (Summary page i, Section 1.1.2 and Section 4.1.1) indicates the estimated volume of imported inert fill at 220,000 m ³ which is well below the upper volume stated.

4.6.5	The magnitude of the dust raising potential of site preparation and restoration works is assessed as MEDIUM.	Assuming the volume of imported waste described in paragraph 4.6.4 of to be erroneous, and it is less than 250,000 m ³ , this is valid.
4.6.6	Describes mineral extractions activities.	<p>No information provided on the height of screening bunds, which determines their effectiveness as mitigation of dust emissions. The Planning Statement, paragraph 5.1.5, indicates bunds of between 3m for top soil and 5m for sub soils.</p> <p>The description of activities omits to state if the extracted minerals are won 'wet' or 'dry'. Sand and gravel mineral resources are often won 'wet' and thus have a lower dust risk potential than some other mineral resources. However, the Planning Statement (paragraph 5.4.2) mentions dewatering and extraction of mineral in a 'dry state'. The wet or dry state of extracted mineral affects the dust risk potential therefore the assessment finding cannot be verified.</p>
4.6.7	Describes the magnitude of the dust raising potential of mineral extraction activities as SMALL.	This is valid assuming wet extraction methods apply, but as above, this is unclear (see 4.6.6). If materials are extracted dry, then a MEDIUM magnitude may be more appropriate.
4.6.8	Describes the magnitude of the dust raising potential of materials handling as SMALL.	<p>The justification indicates that the extracted mineral has a high moisture content. However, the Planning Statement (paragraph 5.4.2) mentions dewatering and extraction of mineral in a 'dry state'.</p> <p>The number of plant is stated to be less than five. Paragraph 5.3.2 of the Planning Statement indicates an excavator, a loading shovel, multiple dump trucks and a bulldozer, so the total could be higher.</p> <p>Despite inconsistencies, a dust raising potential of SMALL is valid for wet extraction. If materials are dry, then a MEDIUM magnitude may be more appropriate, with additional requirements for mitigation.</p>
4.6.9	Describes the magnitude of the dust raising potential of on-site transportation as MEDIUM.	Internal haul roads will be constructed from compacted, imported hardcore materials. In dry conditions these can generate dust as vehicles travel over the compacted material. A magnitude of MEDIUM is considered valid. Roads will require damping down to minimise emissions as part of the dust management plan

4.6.10 and 4.6.11	Describes the magnitude of the dust raising potential of minerals processing as SMALL.	<p>This is considered valid for the processing of wet extracted mineral. The moisture content of the mineral during processing can influence the potential for dust emissions. Later, at paragraph 6.2.4, mineral processing is described as wet washing to produce a damp material.</p> <p>In their consultation response, the Environment Agency^{ix} requested that the applicant provide information including:</p> <ul style="list-style-type: none"> • <i>Waste: The risk of emission of pollutants assessed should include dust, both from extraction and DfR/landfill operations.</i> <p>The latter appears not to have been undertaken. The sub-title identifies ‘waste recycling’ but this is not addressed. Imported inert fill is estimated to be 250,000m³, and is considered a dusty material. Processing of imported material prior to backfilling may have a MEDIUM rather than SMALL dust raising potential.</p> <p>The assessment does not acknowledge the potential for crushing of oversized material (Planning Statement paragraph 5.2.3). Crushing and screening plant is subject to local authority permitting under EPR2016^x with associated requirements for dust control. This should be included if relevant.</p>
4.6.12	Describes the magnitude of dust raising potential from stockpiles / exposed surfaces as MEDIUM.	<p>There is no indication of how stripped soils will be stored, e.g. covered or seeded, and how long they may remain on site.</p> <p>A magnitude of MEDIUM is considered valid in absence of this.</p>
4.6.13	Describes the magnitude of the dust raising potential of off-site transportation as SMALL.	<p>This references IAQM Minerals Guidance thresholds, but does not describe the number of daily HGV movements associated with the proposed development, or the length of paved access road.</p> <p>Paragraph 5.9.2 of the Planning Statement indicates an average 20 outward HGV movements per day. Paragraph 5.9.4 of the Planning Statement indicates >60 outward HGV movements per day. No indication is provided on the scale of traffic during restoration phases.</p> <p>Paragraph 5.1.3 of the Planning Statement indicates asphalt surfacing for a minimum of 30 m on the site access.</p> <p>Paragraph 5.5.3 of the Planning Statement indicates that a wheel wash will be located over 100 m from the site entrance.</p> <p>The full length of road between the wheel wash and site exit to the public highway should be paved with asphalt.</p> <p>The maximum^{xi} number of daily vehicles should be used in assessing dust raising potential, making the magnitude MEDIUM not SMALL.</p>

**	Table 6	Presents a summary of the magnitude of residual dust source emissions.	Despite identified inconsistencies and information gaps, the findings of the Vibrock report for Dust Impact Risk, would be unlikely to change as the maximum magnitude (MEDIUM) has been used in the appraisal at Table 12. There are however likely to be additional mitigation measures that require consideration as a result.
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5.0 Assessment of dust effects

	5.1.2	Describes wind speed for transport of particles	No reference is provided for the stated critical speed of 5.6 m/s. IAQM Minerals Guidance (paragraph 6.2.4) indicates that wind blow of particles may occur from a low as 2.4 m/s, noting that a moderate breeze of 5.5 m/s as a general threshold, but it is preferable to use a threshold specific to the mineral type.
	5.1.3	Describes potential distance travelled by varying particle sizes.	No reference is provided, but it does broadly concur with Box 2 of the IAQM Minerals Guidance.
	5.2.1	Describes a maximum of twelve dry windy working days per year.	With reference to Table 3, this identifies 12 (11.7), dry windy working days where winds are from the west. No account appears to be made for winds from other directions. The windrose in Appendix 1 identifies prevailing winds from the west south west to west north west, but also secondary winds from the east and south east which would affect other receptors. This paragraph infers only 12 working days a year will be influenced by wind, or, that the vast majority of working days will have no wind at all which is misleading. However, the number of dry working days from all sectors are considered individually for each receptor location.
	From 5.2.4 to 5.2.38	Describes the receptor locations relative to the potential dust sources and wind directions / pathways.	For some receptors, distance from the site is stated, for others it is simply given as <100m. Although a threshold in Table A3-3 of the IAQM Minerals Guidance, the actual distance helps to inform the appraisal of human health effects presented in Section 6.
	5.2.5	States screening bunds will shield the receptor.	The height of screening bunds has not been described, with no justification of how these would be effective against wind blown dust.
	5.3 – 5.5	Provides Step by step findings of the minerals dust assessment.	This follows IAQM Minerals Dust Guidance methodology.

6.0 Assessment of human health effects

6.1.3	Presents a flowchart from Planning Practice Guidance.	<p>The method presented in the flowchart considers PM₁₀. It predates more recent government advice (AQS, 2023) that requires Local Authorities to reduce PM_{2.5} emissions from sources within their control, including achieving exposure reduction.</p> <p>Background PM_{2.5} concentrations are presented in Table 4. These are below the 2040 target of 10 µg/m³. The applicant should regardless consider how operations may affect PM_{2.5} concentrations at nearby sensitive receptors and how emissions are to be managed.</p>
6.1.16	Describes the proportional relationship between PM _{2.5} and PM ₁₀ , and the likely additional contribution of the proposed development to PM _{2.5} concentrations.	<p>No reference for the ratio of PM_{2.5}/PM₁₀ of 0.7.</p> <p>The calculation for additional burden of PM_{2.5} is not presented.</p> <p>Inadequate data is presented to support the finding that the proposed development would not result in exceedance on PM_{2.5} objectives.</p>
6.1.17	References a PM _{2.5} objective of 20 µg/m ³ .	<p>Although this is correct, it should also be acknowledged that new targets for PM_{2.5} were legislated in 2023 (SI 2023/96) ^{xii}: annual average of 10 µg/m³ by 2040 with an interim target of 12 µg/m³ by 2028.</p>

6.2	Presents commentary on potential impacts from the proposed development in relation to respirable crystalline silica.	<p>The Addendum to the Scoping Opinion (dated 22/11/22) requires: <i>analysis of the human health impacts of dust including silica rich particulates. The assessment should take into account guidance from the HSE and NHS regarding silica dust impacts including any other research into silica dust related health impacts.</i></p> <p>While Section 6.1 examines potential human health impacts due to emissions of PM₁₀ and PM_{2.5} from the proposed development, Section 6.2 does not present a sufficient <i>analysis</i> of potential RCS impacts, nor any reference to relevant guidance or research published by HSE or NHS (or other relevant sources).</p> <p>Exposure to RCS is governed by the following factors:</p> <ul style="list-style-type: none"> • the proportion of silica in the material, • the mechanical work involved in breaking up or processing the material, • the work patterns influencing when and how individuals may be exposed. <p>HSE provides a guide for employees on RCS^{xiii}, further information specific to quarrying operations^{xiv}, and silica dust including hazard assessment documents.</p> <p>We note in particular that HSE states^{xv} “<i>no cases of silicosis have been documented among members of the general public in Great Britain, indicating that environmental exposures to silica dust are not sufficiently high to cause this occupational disease</i>”.</p> <p>The HSE review^{xvi} contains a potency matrix for RCS which comments that wet extraction or handling processes are associated with reduced potency RCS compared to dry freshly cut surfaces (such as those considered in the review of coal miner exposure referenced in the Vibrock report).</p> <p>The NEPSI Good practice guide^{xvii} states that “<i>the health risks associated with exposure to crystalline silica dust can be controlled and, by using appropriate measures, reduced or eliminated completely. It is just a matter of assessing the risk and taking appropriate action.</i>”</p> <p>Nevertheless, in light of uncertainty over whether wet or dry working methods will be applied for a material with a high proportion of silica, the Applicant’s commentary is deemed inadequate. We recommend a clear source-pathway-receptor approach to risk assessment, referencing relevant materials such as those provided here.</p>
6.2.4	Describes extraction of a damp mineral resource and wet mineral processing.	See previous comments in 4.6.6

^^	6.2.5	Indicates a requirement on the quarry operator for occupational health monitoring.	<p>Reference should be made to relevant supporting documentation.</p> <p>The quarry operator must comply with COSHH Regulations^{xviii} and protect workers' health. Consequently it is expected that risks to any receptors beyond the site boundary should be minimised due to increased distance from source.</p> <p>The HSE WELError! Bookmark not defined. for RCS is 0.1 mg/m³ as an 8 hour time weighted average, whereas the ambient air quality objective for daily mean PM10 is 0.05 mg/m³.</p> <p>In addition to implementing exposure control measures, the quarry operator can undertake health surveillance of workers^{xix xx}.</p>
7.0 Traffic impacts			
	7.5	<i>The proposed quarry development at Misterton meets the Stage 1 criteria...</i>	The proposed quarry is in Preesall so this reference is erroneous. Confirmation that information used in the assessment is for the proposed development, Bourbles Quarry, is required.
	7.7	The proposed development would generate <100 HDV per day.	<p>Screening out of transport emissions is accepted in accordance with IAQM criteria. The number of anticipated vehicle movements should be referenced to the Transport Statement, or Planning Statement, rather than simply indicating a traffic flow of <100.</p> <p>Paragraph 6.6.3 of the ES indicates a practical maximum of 60 HGV movements per day but does not indicate if this is a one or two way. Instead, the NTS states a maximum of 80 two-way HGV movements. The applicant should confirm the <100 is two way.</p>
8.0 Dust Management			
	8	Dust Management	<p>A dust management plan has not been submitted with the ES but is committed to (see 8.11). The measures should be consistent with the likely dust magnitude, which is MEDIUM.</p> <p>All relevant measures for monitoring, management and mitigation of dust from different activities at the proposed development, plus procedures for record keeping of incidents, complaints and corrective actions / resolutions, including recommendations in this review, should be captured in a Dust Management Plan (DMP).</p>
	8.5	References mitigation measures presented in Section 4.0 and Appendix 3.	These are considered to be minimal in the context of the proposals. A comprehensive suite of good practice mitigation measures is presented in Table 4 of the IAQM Minerals Dust Guidance. These should be incorporated within the DMP for the operations.

8.7	All site personnel will be trained as to the potential sources and effective mitigation of dust.	With reference to section 6.2.5 above, all site personnel should also receive training in the potential risks of dust and in methods for reducing their exposure, including RCS.
8.8	Describes visual inspections within the site and on the local road network.	This omits to identify how potential dust soiling beyond the site boundary will be monitored and this should be included in the DMP.
8.9	Describes a complaints handling procedure.	The DMP should ensure records of any corrective actions taken and the effectiveness of such actions are retained.
8.11	Indicates a DMP will be prepared and submitted for approval.	It is recommended this is secured by planning condition and agreed prior to commencement of works. This should include clarification on methods for extraction, bund height and any other items raised in this review as relevant to dust risk and dust control.
8.12	Proposes screening bunds.	A height for the proposed construction of screening bunds is not specified. This should be clarified in the DMP. Section 4.3.3 of the Planning Statement suggest 1.5 m, though this may not be adequate to prevent windblow from stockpiles, which are indicated on Figure 1 as being up to 10 m in height.
8.16	Stockpiling activities will use shielded bays to prevent wind blow of exposed surfaces in the stockpiling areas.	This is contrary to Section 4.6.12 that indicates use of open stockpiles. It is therefore unclear what measures for management of windblown dust from stockpiles the applicant intends to implement. This should be clarified in the DMP
Cumulative impact		
9	<i>... there are very few outstanding planning applications within the last 2 years which have the potential to result in a cumulative impact...</i>	This suggests there are <i>some</i> applications that <i>could</i> have potential to result in a cumulative impact. These are neither identified, nor the potential cumulative impact assessed, rather they are dismissed due to the rural location.
10.0 Conclusions		
10.0	Presents conclusions of the air quality assessment.	Subject to confirmation of a wet extraction method, the overall conclusion that there will be no significant impact is likely to be appropriate but cannot be agreed at this time due to omissions in the report. For this low risk to be borne out in reality it is essential that a comprehensive DMP is produced, which provides for comprehensive mitigation, monitoring and reporting, with continual review and improvement in response to any complaints that may be received or requests from the planning and/or permitting authority to make improvements where practicable. Given local community concerns, a commitment to undertake monitoring for RCS to a) determine presence in material and b) determine potential exposure (as a minimum for workers on site with extrapolation to offsite) should be included.

Appendices

Appendix 3	Presents summary dust control measures.	<p>The measures presented are considered to be minimal.</p> <p>A speed limit of 20 mph is considered high and not appropriate for vehicles within the extraction area or haul roads. Table 5 of the IAQM Minerals Guidance^{vii}, suggests a speed limit of 10 mph on unmade routes.</p> <p>No height is specified for the proposed construction of screening bunds.</p> <p>Appendix 3 states: <i>Vehicle cleaning facilities are to be used.</i> However, this omits to stipulate the provision and use of a wheel wash as specified in paragraph 4.6.13.</p>
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References

- ⁱ IAQM Guidance of the assessment of minerals for planning [mineralsguidance_2016.pdf \(iaqm.co.uk\)](#)
- ⁱⁱ <https://planningregister.lancashire.gov.uk/Document/Download?module=PLA&recordNumber=7932&planId=77945&imageId=355&isPlan=False&fileName=NO-2023-115508-01-L01.pdf>
- ⁱⁱⁱ Environmental Targets (Fine Particulate Matter) (England) Regulations 2023. Available at <https://www.legislation.gov.uk/ukxi/2023/96/contents/made>
- ^{iv} Environment Act 2021. Available from: www.legislation.gov.uk/ukpga/2021/30/contents/enacted
- ^v The UK Government published a new Air Quality Strategy on 28th April 2023 (<https://www.gov.uk/government/publications/the-air-quality-strategy-for-england>). AQS objectives are presented in Annex A.
- ^{vi} HSE EH40/2005 Workplace exposure limits. <https://www.hse.gov.uk/pubns/priced/eh40.pdf>
- ^{vii} http://iaqm.co.uk/text/guidance/mineralsguidance_2016.pdf
- ^{viii} http://iaqm.co.uk/text/guidance/guidance_monitoring_dust_2018.pdf
- ^{ix} <https://planningregister.lancashire.gov.uk/Document/Download?module=PLA&recordNumber=7932&planId=77945&imageId=355&isPlan=False&fileName=NO-2023-115508-01-L01.pdf>
- ^x <https://www.legislation.gov.uk/ukxi/2016/1154/contents/made>
- ^{xi} Although not specified in the IAQM Minerals Guidance, IAQM Construction Dust Guidance (2023) indicates at footnote 10, in relation to trackout, that: *HDV movements during a construction project vary over its lifetime, and the number of movements is the maximum not the average.* The same could be applied to mineral extraction exports.
- ^{xii} The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023
- ^{xiii} HSE INDG463 Control of exposure to silica dust – A guide for employees. <https://www.hse.gov.uk/pubns/indg463.htm>
- ^{xiv} HSE <https://www.hse.gov.uk/lung-disease/quarries.htm>
- ^{xv} HSE online resources for quarries <https://www.hse.gov.uk/quarries/silica.htm>
- ^{xvi} HSE EH75/4 Respirable Crystalline Silica Phase 1 <https://www.hse.gov.uk/pubns/priced/eh75-4.pdf>
- ^{xvii} NEPSI Good Practice Guide on Workers Health Protection through the Good Handling and Use of Crystalline Silica and Products containing it [NEPSI-Good-Practice-Guide.-revised-0821pdf.pdf](#)
- ^{xviii} British Safety Council <https://www.britsafe.org/publications/safety-management-magazine/safety-management-magazine/2023/silica-dust-a-hidden-danger/>
- ^{xix} HSE G404 Health surveillance for those exposed to respirable crystalline silica (RCS) <https://www.hse.gov.uk/pubns/guidance/g404.pdf> and <https://www.hse.gov.uk/pubns/indg463.pdf>
- ^{xx} HSE Health surveillance for those exposed to respirable crystalline silica (RCS) Supplementary Guidance <https://www.hse.gov.uk/pubns/priced/healthsurveillance.pdf>