njd

Environmental Associates

Air Quality Assessment

Caer Glaw Quarry

July 2023

Hogan Group

Air Quality Assessment

Caer Glaw Quarry

Client: **Hogan Group**

Report reference: **NJD20-0058-001R**

Report Version	Prepared By	Reviewed By
Draft	AP	NJD-B
Final	AP	NJD-B

NJD Environmental Associates LTD

www.njdenvironmental.co.uk

Company Registration No 10956987

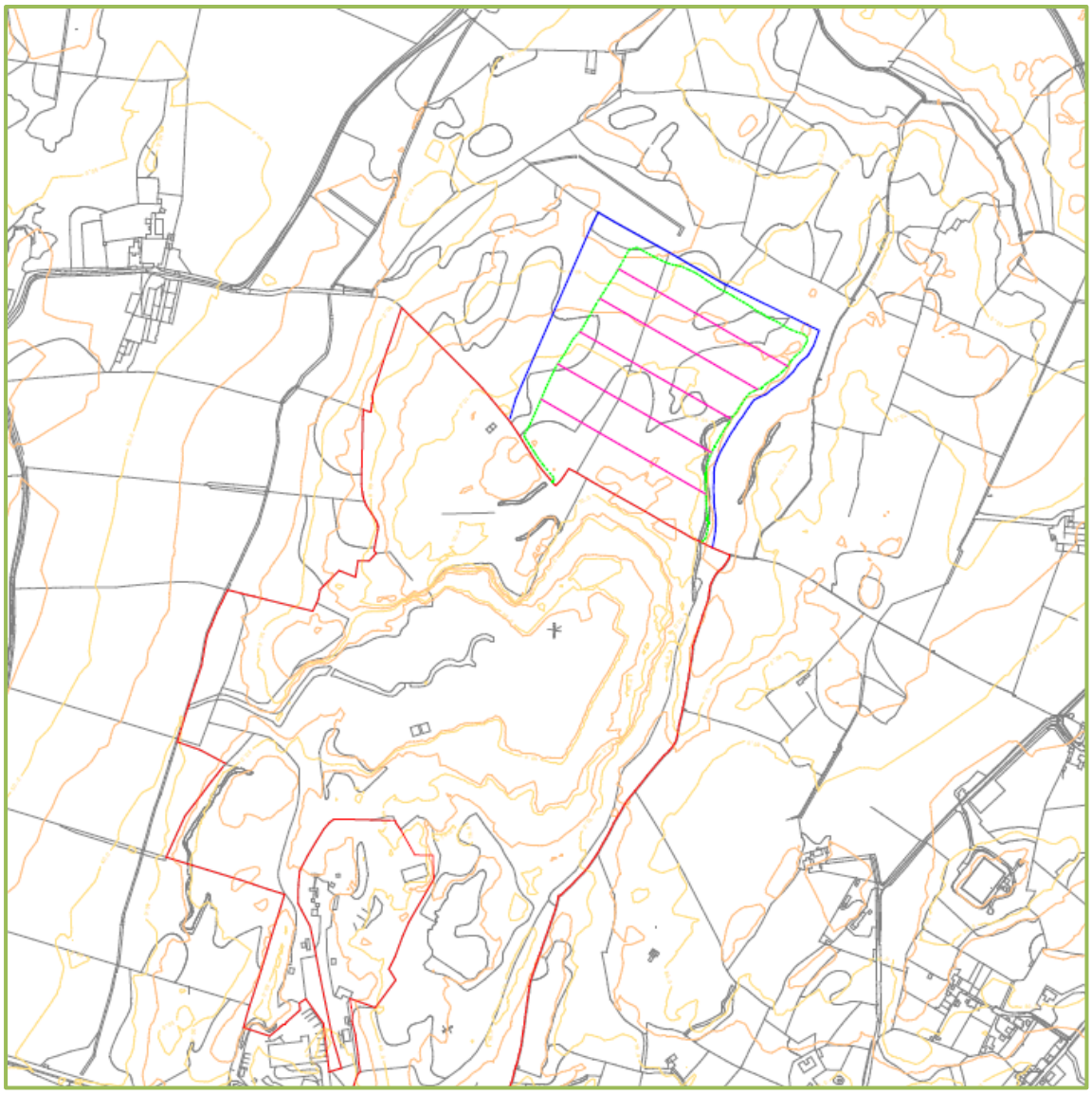
CONTENTS

APPENDICES

1 INTRODUCTION

1.1 Background

1.1.1 NJD Environmental Associates LTD was instructed by Hogan Group to undertake an air quality assessment for a proposed extension to Caer Glaw Quarry at Gwalchmai, Anglesey. The site location and proposed extension is provided below in Drawing 1.



Drawing 1: Site location and proposed extension

1.2 Proposed Scheme

1.2.1 The proposed development is for the extension to the north east of the existing quarry works, in addition to the agreed extension to the north west, granted planning permission in March 2019.

1.2.2 The proposed extension is 8.35 ha and is for the extraction of 3.3 million tonnes (1.23 million cubic metres) of rock, with the intention to work northwards and west and then work in a westerly direction to the proposed boundary, up to a depth of 41.15 m.

1.2.3 The proposal is to continue to use the existing site access to the quarry. The exiting compound area will also be utilised.

1.2.4 All working areas will be stripped of both top and sub soils before they are worked in order to preserve this soil resource. The top and sub soils will either be stored in bunds or the soil will be removed from the site for use elsewhere. The rock reserves lie immediately under the soils and there is limited overburden on the site.

2 LEGISLATION AND POLICY

2.1 Air Quality Standards Regulations (2010)

2.1.1 The Air Quality Standards (Wales) Regulations (2010) provides air quality limit values for seven pollutants and target values for an additional five pollutants, based on the requirements of the EU Directive 2008/50/EC.

2.1.2 Part IV of the Environment Act (1995) requires the UK Government to produce a national air quality strategy containing standards, objectives and measures for improving ambient air quality and to keep these policies under review.

2.1.3 The latest air quality strategy sets out air quality objectives (AQOs), which are maximum concentrations not to be exceeded. Table 1 provides the objective levels of the pollutants considered within the assessment.

Table 1 Air Quality Objectives		
Pollutant	**Concentration (µg/m³)**	**Averaging Period**
NO_2 *Nitrogen Dioxide*	40	Annual mean
	200	1-hour, not to be exceeded on more than 18 occasions per annum
PM_{10} *Particulate Matter less than or equal to 10 µm in diameter*	40	Annual mean
	50	24-hour mean, not to be exceeded on more than 35 occasions per annum

2.1.4 The pollutants provided in the above table are those most relevant to emissions associated with mineral extraction activities and road vehicle exhaust emissions from development traffic and have therefore been considered further in this assessment.

2.2 Local Air Quality Management

2.2.1 Under Section 82 of the Environment Act (1995) (Part IV) Local Authorities (LAs) are required to periodically review and assess air quality within their area of jurisdiction under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves comparing present and likely future pollutant concentrations against the AQOs. If it is predicted that levels at locations of relevant exposure, as summarised in Table 1, are likely to be exceeded, the LA is required to declare an Air Quality Management Area (AQMA). For each AQMA the LA is required to produce an Air Quality Action Plan, the objective of which is to reduce pollutant concentrations in pursuit of the AQOs.

2.3 Planning Policy Wales (PPW)

2.3.1 Planning Policy Wales (PPW, Edition 9, November 2016) sets out the Welsh Government's land use planning policies and how these are expected to be applied. Chapter 13 of PPW deals with minimising and managing environmental risks and pollution, including air quality issues. Section 13.1.1 of PPW states that:

'*Planning and environmental management are separate but complementary. By controlling where development can take place and what operations may be*

carried out, the planning system has an important role in avoiding or minimising the adverse effects of any environmental risks on present or future land use.'

2.3.2 The Framework provides guidance to local authorities on taking air pollution into account in planning policies and decisions. Section 13.10.1 states:

'The planning system should determine whether a development is an acceptable use of land and should control other development in proximity to potential sources of pollution rather than seeking to control the processes or substances used in any particular development.'

2.3.3 PPW sets out the position for development management in relation to air (and water) quality in section 13.12.1 as follows:

'The potential for pollution affecting the use of land will be a material consideration in deciding whether to grant planning permission. Material considerations in determining applications for potentially polluting development are likely to include:

- *location, taking into account such considerations as the reasons for selecting the chosen site itself;*
- *impact on health and amenity;*
- *the risk and impact of potential pollution from the development, insofar as this might have an effect on the use of other land and the surrounding environment (the environmental regulatory regime may well have an interest in these issues, particularly if the development would impact on an Air Quality Management Area or a SAC);*
- *prevention of nuisance;*
- *impact on the road and other transport networks, and in particular on traffic generation; and*
- *the need, where relevant, and feasibility of restoring the land (and water resources) to standards sufficient for an appropriate after use. (Powers under the Pollution Prevention and Control Act 1999 require an operator to return a site to a satisfactory state on surrender of an Integrated Pollution Prevention and Control Permit).'*

2.3.4 The Planning Policy Wales, revised in February 2021, requires that planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of AQMAs and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in AQMAs is consistent with the local air quality action plan.

2.3.5 The Planning Practice Guidance (PPG), revised in November 2019, states that whether or not air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to generate air quality impacts in an area where air quality is known to be poor. They could also arise where the development is likely to adversely impact upon the implementation of air quality strategies and action plans and/or, in particular, lead to a breach of EU legislation (including that applicable to wildlife).

2.3.6 The Minerals Section of the National Planning Policy Guidance (NPPG), paragraphs 23-32, sets out guidance specifically relating to the assessment of environmental impacts of dust and particulate emissions from mineral extraction.

2.3.7 Where dust emissions are likely to arise, mineral operators are expected to prepare a Dust Assessment, which should be undertaken by a competent person/organisation with acknowledged experience of undertaking this type of work.

2.3.8 There are five key stages to a dust assessment study:

- Establish baseline conditions of the existing dust climate around the site of the proposed operations;
- Identify site activities that could lead to dust emission without mitigation;
- Identify site parameters which may increase potential impacts from dust;
- Recommend mitigation measures, including modification of site design; and
- Make proposals to monitor and report dust emissions to ensure compliance with appropriate environmental standards and to enable an effective response to complaints.

2.3.9 These stages have been considered alongside the relevant guidance within this assessment.

3 ASSESSMENT METHODOLOGY

3.1 Introduction

3.1.1 The proposed development has the potential to cause local air quality impacts. These have been assessed in accordance with the methodologies provided below.

3.1.2 Local air quality impacts have been assessed to determine the potential effects at existing sensitive receptors (ESRs) from fugitive dust emissions and particulate matter (PM_{10}) associated with site activities.

3.2 Fugitive Dust

3.2.1 There is the potential for fugitive dust emissions to occur as a result of the extraction, processing, storage and transfer of materials. Vehicle movements also have the potential to resuspend dust from haul road surfaces.

3.2.2 'Dust' is a generic term and has no universally recognised definition. However, the Department of the Environment Minerals Division, December 1995 described 'dust' as comprising organic or inorganic particles in the size range of 1-75µm. Dust particles with an aerodynamic diameter between 1 and 10µm are classed as particulate matter and those between 10 and 75µm are simply termed dust.

3.2.3 Air quality legislation recognises PM10 (10µm) and PM2.5 (2.5µm) are important particle sizes in relation to public health. Particles less than 1µm behave more like gases than solids and are generally referred to as 'fume', whereas particles larger than 75µm are termed 'grit'.

3.2.4 Research commissioned by the Department of the Environment and reported in the *Digest of Environmental Pollution Statistics No. 2 1979*, has shown that dust particles, greater than 30µm (large particles), make up the greatest proportion (c.95%) of mineral dusts. It is generally accepted that the greatest dust impacts and deposition will be within 100m of a source and this includes both large (>30 µm) and small dust particles.

3.2.5 The potential impact on the local community of large and intermediate dust particles dispersing from the site is principally its potential to cause annoyance or nuisance. The IAQM refers to these effects as 'disamenity dust'.

3.2.6 Dust complaints are usually associated with periods of peak deposition, occurring during particular weather conditions. When the rate of disamenity dust exceeds the 'norm' and accumulates on surfaces such as vehicles or window ledges, a nuisance may be perceived by the sensitive receptor. There is a 'normal' level of dust deposition in every community and only when dust deposition rates increase or fluctuate from the 'norm' can complaints become more likely.

3.2.7 However, nuisance is subjective and is difficult to determine accurately as, in part, it depends upon the perceptions of individual residents or households and complaints may not always be received. The effect of dust on a community can be determined by five main factors:

- Location of the potential dust source relative to the community;
- Duration of the site activities that contribute to dust;
- Short-term dustiness during periods of dry weather (climatic factors);
- Frequency or regularity with which these occur; and
- Effectiveness of dust control measures adopted by the site operator.

3.2.8 These impacts have been assessed following the dust risk assessment process provided within the IAQM document *Guidance on the Assessment of Mineral Dust Impacts for Planning*.

3.2.9 The following two potential impacts may occur as a result of the fugitive dust emissions:

- Disamenity impacts – Caused by larger particles that may be visible to the naked eye but are not thought to cause health effects. They may cause disamenity through soiling and staining when deposition occurs on window ledges, cars and laundry; and
- Health impacts – Caused by PM_{10} which can remain suspended in air for long periods of time. Particles of this size are fine enough to be inhaled and therefore have the potential to cause health effects.

3.2.10 The methodology used for the assessment of disamenity and health impacts is provided below.

Screening

3.2.11 The IAQM guidance suggests the assessment procedure should be tailored according to rock type. Should any receptors be identified within 250m (soft rock) or 400m (hard rock) of dust generating activities, then a disamenity dust impact assessment is necessary. Additionally, if receptors are located within 1km of dust generating activities then assessment of PM_{10} concentrations, and therefore health impacts, should also be undertaken.

3.2.12 If sensitive receptors are not present within 1km of dust generating activities, then **negligible** impacts would be expected and no further assessment is necessary.

Site Characteristics and Baseline Conditions

3.2.13 The proposed development and surrounding area are described by taking into account the following factors:

- Extent of the site including boundary;
- Existing site operations, including currently-consented workings;
- Scale and duration of operations, including phasing;
- Type and location of processing activities, including secondary processing (e.g., concrete batching);
- Mineral type and characteristics;
- Production rate;
- Method of working;
- Method of materials handling;
- Location of storage areas and stockpiles; and
- Location and number of access routes and haul roads.

3.2.14 The assessment should also take into account the principal existing dust sources such as dust from existing mineral operations, agricultural activities and construction works.

Disamenity Dust Assessment

3.2.15 The potential for disamenity from fugitive dust emissions is assessed by first allocating the site risk category based on two factors:

- The potential for residual source emissions; and
- The source-pathway effectiveness.

3.2.16 These are outlined further below.

Estimation of Residual Source Emissions

3.2.17 The scale and nature of the works taking place at a development determines the level of residual dust emissions from fugitive sources. The following activities on mineral extraction sites are likely to have the greatest potential for dust emissions:

- Site preparation/restoration (including soil and overburden handling);
- Mineral extraction (including blasting);
- Material handling;
- On-site transportation;
- Mineral processing;
- Stockpiling/exposed surfaces; and
- Off-site transportation.

3.2.18 The criteria used to categorise the residual source emissions for these activities, as contained within the IAQM guidance, is summarised and provided at Table A.1 of Appendix 1 of this report.

3.2.19 The guidance recommends the consideration of the following additional factors when determining the source emission magnitude.

- The likely effectiveness of the dust control measures incorporated into the design of the submitted development scheme;
- Other mitigation measures applied to reduce or eliminate dust; and
- The meteorological conditions that can promote or inhibit the raising of dust at source.

Estimation of Pathway Effectiveness

3.2.20 The primary factor influencing the pathway effectiveness is the distance between the sensitive receptor and the dust sources. However, other factors can cause a higher or a lower category to be assigned. These factors include:

- Location of receptors relative to the site and prevailing wind direction; and
- Topography, terrain and physical features.

3.2.21 Table A.2 of Appendix 1 of this report, provides the IAQM guidance criteria for determining the frequency of potentially dusty winds, based on twelve 30° wind direction sectors.

3.2.22 Hourly meteorological data records from RAF Mona weather station over the period 2016 to 2020 were utilised in the assessment.

3.2.23 Table A.3 of Appendix 1 of this report provides the criteria used to categorise the distance from each receptor, in accordance with the IAQM guidance.

3.2.24 The pathway effectiveness is then determined using the frequency of potentially dusty winds and the receptor distance, as provided within Table A.4 of Appendix 1 of this report.

Estimation of Dust Impact Risk

3.2.25 The residual source emission and source-pathway effectiveness were combined to predict the dust impact risk at individual receptor locations, as provided within Table A.5 of Appendix 1 of this report.

3.2.26 The predicted dust impact risk was then considered alongside the sensitivity of the receptor to provide the likely magnitude of effect. Table A.6 of Appendix 1 of this report outlines the criteria for determining sensitivity to dust soiling effects.

3.2.27 Table A.7 of Appendix 1 of this report outlines the criteria for determining the sensitivity of ecological receptors.

3.2.28 The likely effect at each receptor was determined from the dust impact risk and the receptor sensitivity, as provided at Table A.8 of Appendix 1 of this report.

3.2.29 An estimation of the overall effect from dust deposition on the surrounding area, taking into account the magnitude of effects at different receptors and the number that experience the different effects, is the last step in the assessment.

Health Assessment

3.2.30 If receptors are identified within 1km of a mineral site, then consideration of the effect of potential PM_{10} emissions on human health should be provided. Table A.9 of Appendix 1 of this report, outlines the criteria for determining receptor sensitivity to the health effects of PM_{10}.

3.2.31 Initial assessment should determine the existing background ambient concentration of PM_{10} in the vicinity of the site. If the annual mean concentration is less than 17µg/m^3, then the IAQM guidance states that emissions from a mineral facility are unlikely to lead to exceedances of the relevant AQOs. As such, impacts are considered **negligible** and further assessment is not considered necessary.

3.2.32 Should screening of the relevant data indicate that existing background PM_{10} concentrations are higher than 17µg/m^3, then potential impacts at sensitive receptor locations can be assessed by calculating the change in pollutant levels as a result of the proposed development. The significance of predicted impacts can then be determined in accordance with the methodology outlined in the IAQM guidance *Land-Use Planning and Development Control: Planning for Air Quality (2017)*, as detailed for road vehicle exhaust emissions.

Overall Significance of Fugitive Dust Emission Effects

3.2.33 Subsequent to separately determining the significance of disamenity dust effects and PM_{10} human health effects, the IAQM guidance states that an assessment must reach a conclusion on the likely significance of the overall effect from fugitive dust emissions.

3.2.34 Where the overall effect is moderate or substantial, the effect is likely to be considered significant, whilst if the effect is slight or negligible, the effect is considered to be not significant. It should be noted that this is a binary judgement of either significant or not significant.

4 BASELINE CONDITIONS

4.1 Introduction

Existing air quality conditions in the locality were identified, in order to provide details relating to the baseline conditions. These are detailed in the following sections.

4.2 Local Air Quality Management

4.2.1 IACC has undertaken a Review and Assessment of air quality across the local authority. This process has indicated that concentrations of all pollutants considered within the AQS are currently below the relevant AQOs. As such, no AQMAs have been designated in IACC.

4.3 Background Concentrations

4.3.1 IACC do not undertake any monitoring in the vicinity of the site. Background concentrations of NO_2 and PM_{10} have been obtained from the 2018 based default concentration maps provided by Defra for the grid square containing the site. These are provided below in Table 2.

Table 2 Background Concentrations for 2021		
Grid square	**NO_2 (µg/m³)**	**PM_{10} (µg/m³)**
395500, 564500	3.43	9.28

4.3.2 The background concentrations are well below the national AQOs of 40µg/m^3 at the development site.

4.4 Meteorology

4.4.1 The dispersion of fugitive dust is particularly dependent upon local weather conditions. Therefore, in order to consider the prevailing conditions at the site, local meteorological data has been reviewed. Data was obtained from RAF Mona, located 3km east of the site. It is considered that conditions are likely to be reasonably similar over a distance of this magnitude.

4.4.2 Meteorological data over the period 1st January 2016 to 31st December 2020 (inclusive) was reviewed. The frequency of wind from the twelve sectors is summarised in Table 3 below. This data was provided by Atmospheric Dispersion Modelling Ltd, which is an established distributor of meteorological data in the UK.

Table 3 Wind Frequency Data		
Wind Direction (°)	**Total Frequency of Winds on Dry Hours (%)**	**Total Frequency of Winds of greater than 5m/s on Dry Hours (%)**
345-15 (NNW – NNE)	5.84	1.01
15-45 (NNE – NE)	11.61	2.14
45-75 (NE – ENE)	16.95	7.59
75-105 (ENE – ESE)	4.89	1.51
105-135 (ESE – SE)	1.91	0.33
135-165 (SE – SSE)	2.06	0.39
165-195 (SSE – SSW)	7.36	3.48
195-225 (SSW – SW)	17.99	10.71
225-255 (SW – WSW)	10.72	4.69
255-285 (WSW – WNW)	6.42	1.99
285-315 (WNW – NW)	5.63	1.51
315-345 (NW – NNW)	4.79	0.96
Calms	1.44	N/A

4.4.3 The prevailing wind direction at the site is from the south west.

4.5 Existing Sensitive Receptors (ESRs)

4.5.1 The ESRs considered within this assessment for fugitive dust emissions are provided within the following sections.

Fugitive Dust

4.5.2 ESRs exposed to potential dust disamenity impacts were identified from a desktop study of the area up to 400m from the dust generating activities, as the mineral to be extracted is classed as 'hard rock' within the IAQM guidance.

4.5.3 These are shown in Table 4 below.

Table 4 Existing Sensitive Receptors Considered – Fugitive Dust				
ID and Description	**Distance from Source (m)**	**Direction from Source**	**Proportion of Time Downwind of Source (%)**	**Sensitivity**
ESR1	390	East	8.36	High

4.5.4 As shown in Table 4, there is only one receptor within 400m of dust generating activities associated with the proposed scheme. The ESR is shown at Drawing 2 below.

Drawing 2: Existing sensitive receptor – fugitive dust

4.5.5 There are no ecological receptors sensitive to dust deposition within 400m of the potential dust generating activities. As such, the ecological impacts were not considered further in the context of the assessment.

Human Health

4.5.6 The IAQM guidance states that if the long-term background PM10 concentration is less than 17µg/m^3 there is little risk that emissions from a mineral extraction site would lead to exceedances of the relevant AQOs at locations of relevant exposure. As shown in Table 2, the predicted background concentration in the vicinity of the site is 9.28 µg/m^3 during 2021. This is well below the relevant value and therefore the potential for PM10 emissions from the development to affect human health is considered to be **negligible,** in accordance with the IAQM guidance.

5 IMPACT ASSESSMENT

5.1 Introduction

5.1.1 There is the potential for air quality impacts as a result of the proposed development. These are assessed in the following sections.

5.2 Fugitive Dust

5.2.1 The proposed development has the potential to cause fugitive dust emissions associated with the extraction, processing, storage and transfer of material.

5.2.2 Potential effects were determined using the assessment stages outlined below.

Screening

Dust Disamenity Sensitive Receptors

5.2.3 The desk study undertaken to inform the baseline identified one dust disamenity sensitive receptor within 400m of potential new dust generating activities. As such, a detailed assessment of dust disamenity impacts was required.

Human Health Sensitive Receptors

5.2.4 As outlined at Section 4.5.6, potential effects of PM_{10} emissions from the development on human health are predicted to be **negligible.**

Estimation of Residual Source Emissions

5.2.5 Residual dust source emissions from the main operational activities were classified based on the criteria provided in Table A.1 of Appendix 1 of this report. vehicle and plant numbers and specification are assumed to be the same as the existing consented quarry.

5.2.6 The results are summarised in Table 5.

Table 5 Residual Dust Source Emissions Classification		
Activity	**Residual Source Emission**	**Justification**
Site preparation and restoration	Medium	Site working areas between 2.5ha and 10ha. Less than 5 heavy plant simultaneously active.
Mineral Extraction	Medium	Working area between 2.5ha and 100ha. Extraction rate between 200,000 and 300,000 tpa of material.
Materials Handling	Medium	Loading plant less than 100m from site boundary.
On-site Transportation	Small	Less than 100 movements in any one day.
Mineral Processing	Medium	Processing between 200,000 and 300,000 tpa of material.
Stockpiles/Exposed Surfaces	Small	Stockpile duration of less than 1-month with a total area less than 2.5ha.
Off-Site Transportation	Medium	Between 25 and 200 HGV movements in any one day.

Estimation of Pathway Effectiveness

5.2.7 The pathway effectiveness at the ESR was determined from criteria provided in Tables A2 and A3, provided at Appendix 1 of this report. These are summarised in Table 6.

Table 6 Existing Sensitive Receptor – Pathway Effectiveness					
Receptor	**Frequency of Potentially Dusty Winds**		**Distance from Source**		**Pathway Effectiveness**
	Proportion of Time Downwind of Source (%)	**Category**	**Distance from Source (m)**	**Category**	
ESR1	8.36	Moderately Frequent	390	Distant	Ineffective

5.2.8 As shown in Table 6, the pathway effectiveness was determined to **ineffective** at the ESR considered.

Estimation of Disamenity Dust Impact Risk

5.2.9 The residual source emissions, shown in Table 5 and the pathway effectiveness shown in Table 6, were combined to predict the disamenity dust impact risk using the criteria provided in Table A.5 at Appendix 1 of this report. This is summarised in Table 7.

Table 7 Disamenity Dust Impact Risk

Receptor	Maximum Residual Source Emission	Pathway Effectiveness	Dust Impact Risk
ESR1	Medium	Ineffective	Negligible

5.2.10 As shown in Table 7, the disamenity dust impact risk was determined to be **negligible** at the ESR considered.

5.2.11 The disamenity dust impact risk was considered alongside the sensitivity of the receptor to predict the magnitude of effect. This is summarised in Table 8.

Table 8 Prediction of Disamenity Dust Effects

Receptor	Dust Impact Risk	Receptor Sensitivity	Magnitude of Dust Effect
ESR1	Negligible	High	Negligible

5.2.12 As shown in Table 8, the magnitude of disamenity dust effects was predicted to be **negligible** at the ESR considered.

Overall Significance of Fugitive Dust Emission Effects

5.2.13 The IAQM guidance states that the assessment must reach a conclusion on the overall significance of predicted fugitive dust effects associated with the development. Given that human health effects were predicted to be **negligible** and disamenity dust effects were predicted to be **negligible**, the significance of potential fugitive dust emission effects was concluded to be **not significant**, in accordance with the IAQM methodology.

6 MITIGATION MEASURES

6.1.1 With regards to general site activities, the site operator will follow best practicable means to minimise potential off site dust impacts.

6.1.2 The following measures will be implemented as part of the ongoing environmental management associated with the existing site:

(a) Site staff will receive training on the potential dust sources and how to prevent emissions;

(b) Site staff to undertake regular visual inspections of dust conditions, determined on a daily basis in accordance with prevailing conditions;

(c) Site management will give attention to advance weather forecasts and organise dust management requirements accordingly;

(d) A water bowser will be based on site. This will be used to dampen down road surfaces, stockpiles or work areas in dry weather to reduce the potential for dust emissions at source;

(e) Wheel cleaning facilities will be provided prior to the weighbridge. All vehicles leaving site will be directed through the wheel wash to ensure they do not carry any debris onto the public highway.

(f) Haul roads will be dampened in dry weather conditions;

(g) Onsite vehicle speeds will be controlled to 15mph and monitored;

(h) All material drop heights into lorries will be minimised;

(i) A road sweeper will be available for cleaning internal haul roads and the local highway network, if required;

(j) During persistent high winds, operations that have the potential to create dust will be suspended until conditions improve.

7 CONCLUSION

7.1 Introduction

7.1.1 NJD Environmental Associates has undertaken an air quality assessment for a proposed extension to C'aer Glaw quarry at, Gwalchmai, Anglesey.

7.1.2 The proposals have the potential to cause air quality impacts at sensitive locations in the vicinity of the site as a result of fugitive dust.

7.2 Fugitive Dust

7.2.1 Potential dust disamenity impacts were assessed in accordance with the IAQM methodology and considered receptor location and sensitivity, dust source potential and prevailing meteorological conditions. The disamenity dust impact was predicted to be **negligible.**

7.2.2 Potential human health impacts associated with fugitive dust emissions from the site were assessed against the criteria provided within the IAQM guidance document. This indicated the overall impact of PM_{10} emissions on human health was predicted to be **negligible**.

7.2.3 Following consideration of the relevant issues, the overall significance of fugitive dust effects as a result of the proposed development was predicted to be **not significant**, in accordance with the IAQM methodology.

7.3 Summary

It is concluded that air quality should not be a prohibitive factor in the determination of this planning application.

Environmental Associates

NJD Environmental Associates LTD

www.njdenvironmental.co.uk

Company Registration No 10956987

Appendix 1 – IAQM Guidance on the Assessment of Mineral Dust Impacts for Planning Criteria

Table A.1 Magnitude of Residual Source Emissions

Magnitude	Activity	Criteria
Large	Site Preparation/Restoration	- Working greater than 10ha - Bunds greater than 8m in height and unseeded - More than 100,00m3 of material movement - More than 10 heavy plant simultaneously active - Fine grained and friable material
	Mineral Extraction	- Working area greater than 100ha - Drilling and blasting frequently used - Dusty mineral of small particle size and/or low moisture content - 1,000,000 tpa extraction rate
	Materials Handling	- More than 10 loading plant within 50m of a site boundary - Transferring material of a high dust potential and/or low moisture content on dry, poorly surfaced ground
	On-Site Transportation	- More than 250 movements in any one day on unpaved surfaces of potentially dusty material
	Mineral Processing	- A mobile crusher and screener with a concrete batching plant on-site - Processing more than 1,000,000 tpa of material with a high dust potential and /or low moisture content e.g. hard rock
	Stockpiles/Exposed Surfaces	- Total exposed area more than 10 ha in an area exposed to high wind speeds located less than 50m from the site boundary - Daily transfer of material with a high dust potential and/or low moisture content - Stockpile duration more than 12 months and a quarry production more than 1,000,000 tpa
	Offsite Transportation	- More than 200 HDV movements in any one day on unsurfaced site access road less than 20m in length with no HDV cleaning facilities - No road sweeper available
Medium	Site Preparation/Restoration	- Site working area between 2.5 ha and 10 ha - Bunds between 4m and 8m in height - Between 20,000m3 and 100,00m3 of material movement - Between 5 and 10 heavy plant simultaneously active
	Mineral Extraction	- Working area between 2.5ha and 100ha - Extraction rate between 200,00 tpa and 1,000,000 tpa
	Materials Handling	- 5 to 10 loading plant between 50m and 100m of a site boundary
	On-Site Transportation	- Between 100 and 250 movements in any one day
	Mineral Processing	- Processing between 200,000 tpa and 1,000,000 tpa of material

	Stockpiles/Exposed Surfaces	- Total exposed area between 2.5 ha and 10 ha located 50m to 100m from the site boundary - Stockpile duration between 1 month and 12 months
	Offsite Transportation	- Between 25 and 200 HDV movements in any one day
Small	Site Preparation/Restoration	- Site working area less than 2.5 ha - Bunds less than 4m height and seeded - Less than 20,000m3 of material movement - Less than 5 heavy plant simultaneously active - Material with a high moisture content
	Mineral Extraction	- Working area less than 20ha - Hydraulic excavator - Coarse material and/or high moisture content - Less than 200,00 tpa extraction rate
	Materials Handling	- Less than 5 loading plant more than 100m of a site boundary, within the quarry void or clean hardstanding, transferring material of low dust potential and/or high moisture content
	On-Site Transportation	- Covered conveyors for the majority of the on-site transportation of material - Less than 100 vehicle movements in any one day - Surface materials of compacted aggregate - Transport route less than 500m in length - Maximum speed of 15mph
	Mineral Processing	- Fixed screening plant with effective design in dust control - Processing less than 200,000 tpa of material with a low dust potential and/or high moisture content, e.g. wet sand and gravel
	Stockpiles/Exposed Surfaces	- Stockpile duration of less than 1 month with a total area of less than 2.5ha in an area of low wind speeds - Located more than 100m from the site boundary - Weekly transfers of material with a low dust potential and/or high moisture content - Quarry production less than 200,000 tpa
	Offsite Transportation	- Less than 25 HDV in any one day - Paved surface site access road more than 50m in length - Effective HDV cleaning facilities and procedures - Road sweeper

Table A.2 Categorisation of Frequency of Potentially Dusty Winds

Frequency Category	Criteria
Infrequent	Frequency of winds (>5 m/s) from the direction of the dust source on dry days are less than 5%
Moderately frequent	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are between 5% and 12%
Frequent	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are between 12% and 20%
Very frequent	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are greater than 20%

Table A.3 Categorisation of Receptor Distance from Source

Category	Criteria
Distant	Receptor is between 200 m and 400 m from the dust source
Intermediate	Receptor is between 100 m and 200 m from the dust source
Close	Receptor is less than 100 m from the dust source

Table A.4 Pathway Effectiveness

		Frequency of potentially dusty winds			
		Infrequent	**Moderately frequent**	**Frequent**	**Very frequent**
Receptor Distance Category	**Close**	Ineffective	Moderately Effective	Highly Effective	Highly Effective
	Intermediate	Ineffective	Moderately Effective	Moderately Effective	Highly Effective
	Distant	Ineffective	Ineffective	Moderately Effective	Moderately Effective

Table A.5 Estimation of Dust Impact Risk

		Residual Source Emissions		
		Small	**Medium**	**Large**
Pathway Effectiveness	**Highly effective pathway**	Low Risk	Medium Risk	High Risk
	Moderately effective pathway	Negligible Risk	Low Risk	Medium Risk
	Ineffective pathway	Negligible Risk	Negligible Risk	Low Risk

Table A.6 Sensitivities of People to Dust Soiling Effects

Receptor Sensitivity	**Criteria**
High	- Users can reasonably expect enjoyment of a high level of amenity; or - The appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land - Indicative examples include dwellings-, medium- and long-term car parks and showrooms
Medium	- Users would expect to enjoy a reasonable level of amenity, but would not be reasonably expected to enjoy the same level of amenity as their home; or - The appearance, aesthetics or value of their property could be diminished by soiling; or - The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land - Indicative examples include parks and places of work
Low	- The enjoyment of amenity would not reasonably be expected; or - There is property that would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or, - There is transient exposure, where the people or property would reasonably be expected to be present for only limited periods of time as part of the normal pattern of use of the land - Indicative examples include playing fields, farmland (unless commercially sensitive horticultural), footpaths, short term car parks and roads

Table A.7 Sensitivities of Receptors to Ecological Effects

Receptor Sensitivity	Criteria
High	- Locations with an international designation and the designated features may be affected by dust soiling - Locations where there is a community of a particularly dust sensitive species - Indicative examples include a Special Area of Conservation designed for acid heathlands adjacent to a minerals development releasing alkaline dusts
Medium	- Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown - Indicative examples include Sites of Specific Scientific Interest or a local wildlife site with very specific sensitivities
Low	- Locations with a local designation where the features may be affected by dust deposition - Indicative examples include a Local Nature Reserve with dust sensitive features

Table A.8 Descriptors for Magnitude of Dust Effects

		Receptor Sensitivity		
		Low	**Medium**	**High**
Dust impact risk	**High Risk**	Slight Adverse Effect	Moderate Adverse Effect	Substantial Adverse Effect
	Medium Risk	Negligible Effect	Slight Adverse Effect	Moderate Adverse Effect
	Low Risk	Negligible Effect	Negligible Effect	Slight Adverse Effect
	Negligible Risk	Negligible Effect	Negligible Effect	Negligible Effect

Table A.9 Sensitivities of Human Receptors to the Health Effects of PM_{10}

Receptor Sensitivity	Criteria
High	- Locations where members of the public are exposed over a long period of time relevant to the AQO for PM10 - Indicative examples include residential properties, hospitals, schools and residential care homes
Medium	- Locations where people are occupationally exposed over a full working day - Indicative examples include offices, warehouses and industrial units
Low	- Locations where human exposure is transient - Indicative examples include public footpaths, playing fields, parks and shopping streets