CHAPTER 10

AIR QUALITY

QUARRY CONSULTING

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CHAPTER 10: AIR QUALITY

Introduction

10.1 This Chapter of the Environmental Impact Assessment Report (EIAR), prepared by Quarry Consulting addresses the potential air quality related impacts associated with the deepening of an existing permitted limestone quarry at Cregaree, Cong, Co. Mayo

10.2 The proposed development will involve:

- the deepening of 19 ha. of the existing permitted quarry extraction area (Plan File Ref. No. 20/77: ABP-308748-20 & Plan File Ref. No. PL16.SU0132: QD16.QD0009) from 12 mOD to -5 mOD;
- Haulage of material to existing fixed plant within the main quarry for processing.
- All associated ancillary facilities/works.
- Landscaping and restoration of the site.

10.3 Further details on The Proposed Development are provided in Chapter 3.

Purpose of the Chapter

10.4 This chapter is aimed at assessing and documenting the potential impacts on air quality that could arise from the deepening of the existing limestone quarry. Within the context of a quarry operation, such impacts are related to processes like blasting, extraction, processing, and transport of the quarried limestone.

10.5 The chapter is designed to present the current baseline conditions, identify potential air pollutant sources, estimate the likely magnitude and significance of these impacts, and propose suitable mitigation measures. A key objective is to ensure the proposed project adheres to all relevant air quality regulations and standards.

Scope of the Assessment

10.6 The primary focus of this air quality assessment is on the operational phase of the proposed deepening to the existing limestone quarry. The aim is to identify, analyse, and document potential effects to local air quality that could result from various quarry operations, including the blasting, extraction, crushing, and transportation.

10.7 In addition to the application of Irish Guidelines as outlined in EPA (2006) and (2022), and in the absence of Irish Guidance specifically focussed on quarries and air quality, the work presented in this EIAR Section has also applied UK practical guidance as published by the **UK Institute of Air Quality Management Management - Guidance on the Assessment of Mineral Dust Impacts for Planning (May 2016).**

10.8 The later sections of this chapter will discuss:

- Screening;
- Legislative Policy and Context;
- Methodology;
- Site Characteristics and The Proposed Development;
- Baseline Conditions;

- Impact Assessment;
- Mitigation Measures and Best Practices;
- Residual Impacts and Monitoring Program.

Contributors

10.9 Quarry Consulting undertook the impact assessment presented in this chapter on behalf of McGraths Limestone (Cong) Ltd. This chapter was prepared by Rory Brickenden (B.A. MEngSc). The lead consultant for the study was Peter Kinghan (Chartered Mineral Surveyor), Post Graduate Diploma in Environmental Engineering.

Peter Kinghan

10.10 The Air Quality chapter of the Environmental Impact Assessment Report (EIAR) for the proposed quarry expansion has been authored by Peter Kinghan, a Chartered Mineral Surveyor and Chartered Geomatics Surveyor with over 20 years of professional experience in environmental impact assessments across diverse sectors, including extractive industries, waste management, and energy. He holds a Diploma in Geo Surveying, a Degree in Mineral Surveying and Resource Management, a certificate in Environmental Sustainability from University College Dublin (2024) and a Diploma in Environmental Engineering from Trinity College Dublin (2006), complemented by a Master's degree in Business Management. Additionally, Peter is certified in Geographic Information Systems (DIT 2008).

Rory Brickenden BA, MEngSc.

10.11 The Air Quality chapter of the Environmental Impact Assessment Report (EIAR) for the proposed quarry deepening has been completed by Rory Brickenden, a geoscientist with Quarry Consulting. Rory holds a BA in Geoscience from Trinity College Dublin (2023) and a Master's degree in Water, Waste, and Environmental Engineering from University College Dublin (2024). His professional experience encompasses a variety of environmental assessments, particularly in the quarry and energy sectors.

Screening of Detailed Assessment

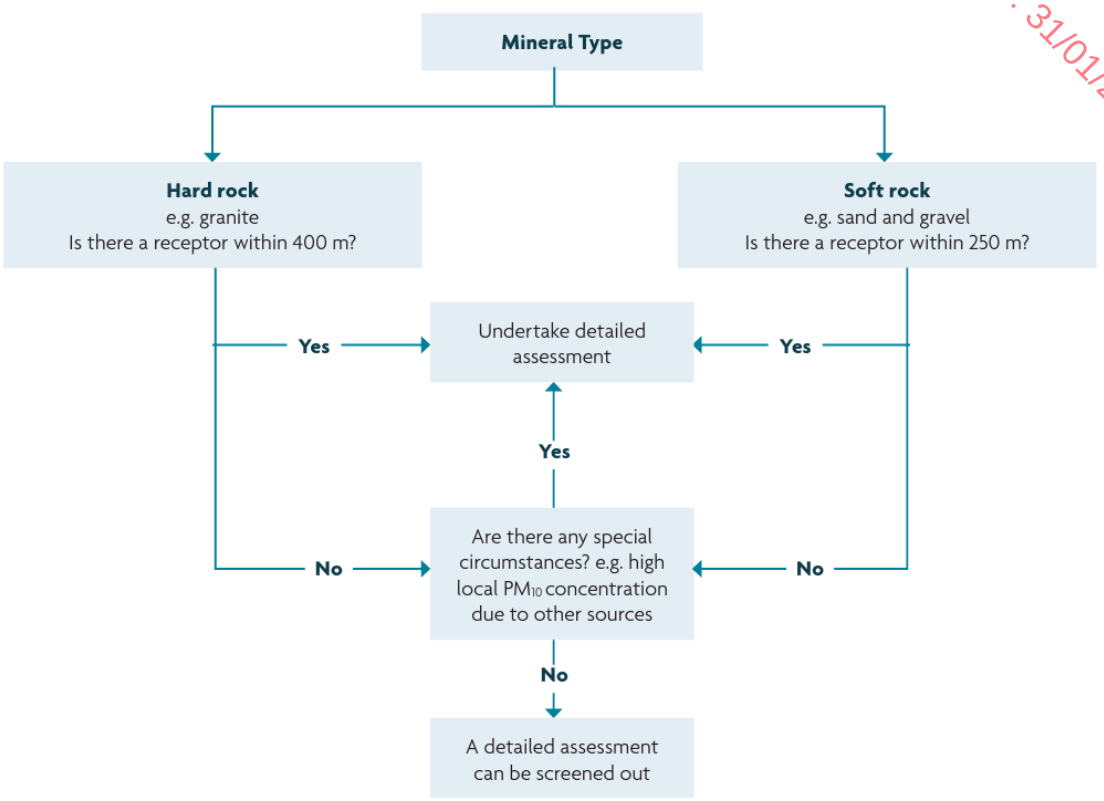
10.12 As per the 'Guidance on the Assessment of Mineral Dust Impacts for Planning'[1] there is the potential to screen the need for a detailed assessment. Section 3 of the report states:

> *"Where there are no receptors near to a mineral site there will be no significant effect. Therefore it is possible to screen out the need for a detailed assessment based on the distance from a mineral site to potentially sensitive receptors."*

10.13 The flow chart (Figure 10.1) provides the steps undertaken in the screening of the assessment.

[1] IAQM; Guidance on the Assessment of Mineral Dust Impacts for Planning, 2016

Figure 10.1: Screening of Detailed Assessment



10.14 The proposed development involves the extraction of limestone which is a hard rock, and the nearest receptor is located approx. 121m from the proposed development application boundary.

10.15 A detailed assessment must be carried out to assess the impacts arising from dust due to the proposed development. This assessment will take into account existing and proposed operations. It also considers the potential impact on health and the potential effect on flora and fauna including any designated sites that may be affected.

Legislative Context and Policy

Air Quality Standards

10.16 The Clean Air for Europe (CAFE) Directive (2008/50/EC) was published in May 2008, replacing earlier directives. This Directive was transposed into Irish legislation by the Air Quality Standards (AQS) Regulations 2011 (S.I. No. 180 of 2011), which established the national policy on air quality. These regulations were the primary basis for assessing and managing air quality in Ireland until recently (source: epa.ie)[2].

10.17 The Directive (EU) 2024/2881 on Ambient Air Quality and Cleaner Air for Europe (recast) was adopted by the European Parliament and the Council on the 23rd of October 2024. This directive was published in the Official Journal of the European Union on 20th of November 2024, entering into force on the 10th of December 2024, 20 days after publication.

10.18 The Directive (EU) 2024/2881 builds on the CAFE Directive, setting new and more stringent air quality standards under the EU's Zero Pollution Action Plan as part of the European Green Deal. The directive introduces phased limit values to be attained by 2026 and 2030, reflecting the EU's commitment to reducing the health and environmental impacts of air pollution.

10.19 The Directive (EU) 2024/2881 aims to:

a) Reduce the health and environmental impacts of air pollution by establishing stricter limit values, target values, and average exposure reduction obligations for key pollutants;

b) Ensure a transition towards a toxic-free environment by 2050, with staged air quality standards for 2026, 2030, and beyond;

c) Improve air quality monitoring, modelling, and public reporting mechanisms;

d) Facilitate coordinated efforts across Member States to manage transboundary air pollution.

10.20 The directive introduces specific air quality standards for pollutants such as:

- nitrogen oxides;
- sulphur dioxide;
- carbon monoxide;
- ozone;
- particulate matter (PM10 and PM2.5);
- benzene;
- lead; and
- heavy metals.

10.21 The World Health Organization (WHO) Air Quality Guidelines (2021) set stringent limits for key air pollutants to protect public health. These guidelines recommend lower thresholds than current EU standards for pollutants such as $PM_{2.5}$, PM_{10}, NO_2, and SO_2, reflecting the latest scientific evidence on the health impacts of air pollution. While these guidelines are not legally

[2] https://airquality.ie/information/air-quality-standards

binding, they serve as a benchmark for policymakers aiming to reduce air pollution and its associated health risks.

10.22 Table 10.1 outlines the air quality limit values for the protection of human health, highlighting thresholds for key pollutants as established under the CAFE Directive (2008/50/EC), the Directive (EU) 2024/2881, and the latest WHO Air Quality Guidelines (2021). Table 10.2 presents air quality limit values for the protection of vegetation and ecosystems.

Table 10.1 Air quality limit values for human health

Human Health	Air Quality Emission Limit Values (µg/m³)				
Pollutant	Averaging Period	CAFE Directive (2008/50/EC)	Directive (EU) 2024/2881 (Limits to be attained by **2026**)	Directive (EU) 2024/2881 (Limits to be attained by **2030**)	WHO Air Quality Guidelines
Nitrogen Dioxide (NO_2)	Hour	200 μ g/m³ (not to be exceeded more than 18 times in a calendar year)	200 µg/m³ (not to be exceeded more than 18 times in a calendar year)	200 μ g/m³ (not to be exceeded more than 3 times in a calendar year)	200 μ g/m³
	24 hours	N/a	N/a	50 μ g/m³ (not to be exceeded more than 18 times in a calendar year)	25 μ g/m³ (3-4 exceedance days per calendar year)
	Calendar Year	40 μ g/m³	40 μ g/m³	20 μ g/m³	10 μ g/m³
Sulphur Dioxide (SO_2)	10 minutes	N/a	N/a	N/a	500 μ g/m³
	Hour	350 μ g/m³ (not to be exceeded more than 24 times in a calendar year)	350 μ g/m³ (not to be exceeded more than 24 times in a calendar year)	350 μ g/m³ (not to be exceeded more than 3 times in a calendar year)	N/a
	24 hours	125 μ g/m³ (not to be exceeded more than 3 times in a calendar year)	125 μ g/m³ (not to be exceeded more than 3 times in a calendar year)	50 μ g/m³ (not to be exceeded more than 18 times in a calendar year)	40 μ g/m³ (3-4 exceedance days per calendar year)

	Calendar Year	N/a	N/a	20 μ g/m^3	N/a
Particulate matter with aerodynamic diameter of less than 10µm (PM_{10})	24 hours	50 μ g/m^3 (not to be exceeded more than 35 times in a calendar year)	50 μ g/m^3 (not to be exceeded more than 35 times in a calendar year)	45 μ g/m^3 (not to be exceeded more than 18 times in a calendar year)	45 μ g/m^3 (3-4 exceedance days per calendar year)
	Calendar Year	40 μ g/m^3	40 μ g/m^3	20 μ g/m^3	15 μ g/m^3
Particulate matter with aerodynamic diameter of less than 2.5µm ($PM_{2.5}$)	24 hours	N/a	N/a	25 μ g/m^3 (not to be exceeded more than 18 times in a calendar year)	15 μ g/m^3 (3-4 exceedances per calendar year)
	Calendar Year	25 μ g/m^3 (stage 1 $PM_{2.5}$) 20 μ g/m^3 (stage 2 $PM_{2.5}$)	25 μ g/m^3	10 μ g/m^3	5 μ g/m^3
Lead	Calendar Year	0.5 μ g/m^3	0.5 μ g/m^3	0.5 μ g/m^3	0.5 μ g/m^3
Carbon Monoxide	1 hour	N/a	N/a	N/a	30,000 μ g/m^3
	8 hours	10,000 μ g/m^3	10,000 μ g/m^3	10,000 μ g/m^3	10,000 μ g/m^3
	24 hours	N/a	N/a	4,000 μ g/m^3 (not to be exceeded more than 18 times in a calendar year)	4,000 μ g/m^3 (3-4 exceedance days per calendar year)

Benzene	Calendar Year	5 μ g/m^3	5 μ g/m^3	3.4 μ g/m^3	1.7 μ g/m^3
Ozone	Maximum daily 8 hour mean	120 μ g/m^3 (not to be exceeded more than 25 days per calendar year averaged over 3 years)	120 μ g/m^3 (not to be exceeded more than 18 days per calendar year averaged over 3 years)	120 μ g/m^3 (not to be exceeded more than 18 days per calendar year averaged over 3 years)	100 μ g/m^3 (3 J exceedances per calendar year)

Table 10.2 Air quality limit values for vegetation and ecosystems

Vegetation		**Air Quality Emission Limit Values (µg/m³)**	
Pollutant	Averaging Period	CAFE Directive (2008/50/EC)	Directive (EU) 2024/2881
Nitrogen dioxide (NOx)	Calendar year	30 μ g/m^3	30 μ g/m^3
Sulphur Dioxide (SO_2)	Calendar year	20 μ g/m^3	
	1st October - 31st March) (Winter mean)	20 μ g/m^3	20 μ g/m^3

Air Quality Monitoring and Compliance in Ireland

10.23 Ireland's air quality monitoring network has expanded significantly in recent years. As of November 2024, the network consists of 112 operational stations, providing coverage across the country. This network plays a crucial role in generating public health advice, assessing compliance with EU air quality standards, and supporting policy decisions. The EPA, in collaboration with local authorities, public bodies, and universities, manages the monitoring network to ensure the data is robust and reliable. Real-time air quality data, accessible through the *airquality.ie*[3] platform, supports public awareness, national and international reporting, and public health actions.

10.24 In 2022, Ireland successfully met all its legal requirements under the Cleaner Air for Europe (CAFE) Directive[4]. None of the monitored pollutants, including PM_{10}, $PM_{2.5}$, NO_2, and SO_2, exceeded the EU limit values. However, challenges remain, particularly regarding $PM_{2.5}$ from solid fuel combustion and NO_2 from vehicle emissions in urban areas. These local challenges highlight the importance of continued investment in cleaner technologies and public awareness initiatives.

10.25 The adoption of Directive (EU) 2024/2881 introduces stricter limits to be phased in by 2026 and 2030, reflecting the EU's commitment to reducing air pollution and protecting public health. These enhanced standards will present additional challenges, particularly in heavily urbanised or traffic-congested areas, requiring further innovation and coordinated policy efforts to maintain compliance.

Relevant Guidance

10.26 This assessment has been undertaken with guidance from the 'Guidelines on the information to be contained in environmental impact assessment reports', published by the EPA in May 2022 and 'Environmental Impact Assessment of projects, guidance on the preparation of the Environmental Impact Assessment Report' published by the European Commission in 2017.

10.27 Other guidance documents considered in this assessment include:

- IAQM; Guidance on the Assessment of Mineral Dust Impacts for Planning, 2016;
- EPA; Guideline Document entitled Environmental Management in the Extractive Industries, 2006;
- Mayo County Development Plan 2022-2028;
- Climate Action Plan, 2024;
- Quarries and Ancillary Activities – Guidelines for Planning Authorities – DOEHLG, April 2004.

Planning Policy

10.28 Currently, the National Planning Policy lacks dedicated regulations addressing air emissions within the realm of the extractive industry or associated activities. The responsibility of evaluating land use and planning matters linked to the extractive industry and related undertakings falls upon Local Authorities when formulating their County Development Plans.

[3] https://airquality.ie/

[4] https://www.epa.ie/publications/monitoring--assessment/air/air-quality-in-ireland-2022.php#:~:text=Summary%3A%20Air%20quality%20in%20Ireland,based%20WHO%20guidelines%20in%202022.

The overarching goal of planning policy is to establish a sustainable management approach for activities and outcomes, achieving a well-balanced equilibrium among environmental, economic, and social factors.

Mayo County Development Plan 2022-2028

10.29 The current Mayo County Development Plan was adopted on the 29th of June 2022. The Plan came into effect on the 10th of August 2022. It includes a number policies and objectives for the planning and sustainable development of the County from 2022-2028. The following policies relate to air quality:

- NEP 24:

'To support and facilitate the implementation of the Air Quality Regulations.'

- NEP 25:

'To promote the implementation of the Noise Directive 2002/49/EC and associated Environmental Noise Regulations 2006, as amended.'

10.30 The following objective relate to air quality and are relevant to this development:

- NEO 44:

'Promote the achievement of best ambient air quality, compatible with sustainable development, in accordance with the EU Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive (2008/50/EC) and by ensuring that all air emissions associated with new developments are within Environmental Quality Standards as set out in the Air Quality Standards Regulations 2011 (SI No. 180 of 2011) (or any updated/ superseding documents).'

10.31 The following policies relate to extractive industries and are relevant to air quality:

- EDP 27:

'To support adequate supplies of aggregate resources to meet the future growth needs of the county and the wider region where there is a proven need for a certain mineral/aggregate and to exercise appropriate control, while addressing key environmental, traffic and social impacts.'

- EDP 28:

'To support the development of aggregate resources (stone and sand/gravel deposits) in a manner which minimises effects on the environment and having regard to the principles of sustainability.'

10.32 The following objectives relate to extractive industries and are relevant to air quality:

- EDO 62:

'To ensure that the development of aggregate resources (stone and sand/gravel deposits) is carried out in a manner which minimises effects on the environment, including the Natura 2000 network and its sustaining habitats (including water dependent habitats and species), amenities, infrastructure and the community, and can demonstrate environmental enhancement through habitat management plans/ecological restoration.'

- EDO 63:

'Have regard to the Quarry and Ancillary Activities Planning Guidelines for Planning Authorities DoEHLG (April 2004) and to the Geological Survey of Ireland's Geological Heritage Guidelines for Extractive Industries, or any new or subsequent quarry guidance.'

Guidelines Extractive Industry Emissions Limit Values

10.33 In 1996, the Irish Concrete Federation (ICF), the trade body representing the interests of quarry operators and producers of construction materials, published the ICF Environmental Code which provided guidance for its members on best practice in the environmental management of quarries. The document was subsequently updated in 2005.

10.34 Section 261 of the Planning and Development Act 2000 (as amended), which regulates a significant proportion of established pit development, came into effect in April 2004. The Department of Environment planning guidelines for the extractive industry 'Quarries and Ancillary Activities – Guidelines for Planning Authorities' (DoEHLG 2004) were published around the same time.

10.35 Separately, in 2006, the EPA published its Environmental Management Guidelines for Environmental Management in the Extractive Industry (Non-Scheduled Minerals).

10.36 There are several methods to measure dust deposition but only the German TA Luft Air Quality Standards (TA Luft, 1986) specify a method of measuring dust deposition – the Bergerhoff Method (German Standard VDI 2119, 1972) – with dust nuisance.

10.37 When implementing the above standard the EPA and other guidelines, recommend a dust deposition limit value of 350 mg/m2/day (when averaged over a 30-day period) be adopted at site boundaries associated with quarrying related activities. This limit value has been applied in this assessment.

Site Dust Monitoring

10.38 The quarry operates under the guidance of an Environmental Management Scheme (EMS) for the purpose of environmental management and control at the existing quarry. Dust monitoring using the Bergerhoff method has been undertaken over a number of years as part of the monitoring scheme under the current planning and the most recent version of the EMS.

Methodology

Selection of Weather Station

10.39 The closest weather stations with enough appropriate records to best represent long term conditions at the subject site is Claremorris weather station. Claremorris has been adopted for being the closest weather station illustrating monthly rainfall. The weather stations is located such that the meteorological data collected closely represented the conditions experienced at the proposed development.

Dust Dispersal

10.40 In practice, the number of days when dust may be transported beyond the existing quarry boundary and the proposed deepening area is quite limited. The reasons are being that heavier rainfall has the potential to provide natural suppression over longer periods than one day. Also, a combination of dry weather and wind is required to raise and transport airborne dust. Most windy days occur in the winter when weather conditions tend to be wetter.

Windspeed Direction and Frequency

10.41 The amount of dust capable of being dispersed to a particular location together with its frequency, is related to several factors including distance, weather and topography.

Distance

10.42 As dust travels downwind from the source it disperses outwards and upwards and progressively falls to the ground surface, with larger particles falling first. As a result, the concentration of dust reduces rapidly from the source of the emission. Most emitted dust is deposited generally, within a distance of a few tens of metres. Smaller particles have the potential to travel further but with minimal significance due to dispersion such that any cumulative concentration would fall well below Air Quality Objectives.

Topography

10.43 Topography is also a significant factor with respect to dust dispersal. There is a substantial change in level between the sources of dust within the current quarry excavation and processing areas and sensitive receptors. These processing areas will to a large extent, be the same as they are at the present time.

10.44 Receptors are mainly at a significantly higher elevation from the principal sources of dust. The local terrain between the main source and the receptor acts as a physical barrier. This effectively provides a natural shelter for nearby receptors and reduces significantly any airborne concentrations.

Weather

10.45 Two main elements of weather play an important part in the dispersion of dust particles. These are wind and rainfall. The direction in which airborne dust will travel, and be deposited, is determined by the direction from which the wind travels. The wind speed and gusts will dictate how far dust may travel.

10.46 Rainfall is an important factor in dust dispersal as it acts as a natural dust suppressant. Ireland has a maritime climate which results in high levels of rainfall. The weather tends to be mild, moist and changeable with abundant rainfall and in general a lack of temperature extremes. This has a significant effect on dust emissions.

10.47 Relatively small amounts of daily rainfall, c. >0.2mm are sufficient to ensure that dust is not readily dispersed away from its source.

10.48 Research carried out in the Netherlands with a climate broadly similar to Ireland concluded that it took a period of 28 hours following rainfall events for particulate matter (PM) in the form of road dust to reach 50%, of its maximum mobility. It took 90 hours to reach 90% mobility of its maximum mobility (Source-Effect of rain events on the mobility of road dust load in two Dutch and Spanish roads[5].

10.49 The data from the Claremorris weather station shows monthly precipitation from 2021 – May 2024 (see table 10.3)

Table 10.3 Total monthly rainfall in millimetres for Claremorris weather station

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2024	115.9	131.2	124.3	91.5	85	51.4	65.7	180.6	54.1	109.7	111.4	113.3	1234.1
2023	121.9	31.5	164.5	92.6	45.3	60.5	173	109	121.7	136.7	125.5	205.3	1387.5
2022	65.4	150.7	57	58.7	85	101.4	43.1	45.4	93.1	190.9	185.4	112.8	1188.9
2021	139.1	133.9	140.3	29.6	132.6	45.8	73.8	111.8	102.5	167.4	74.6	98.8	1250.2

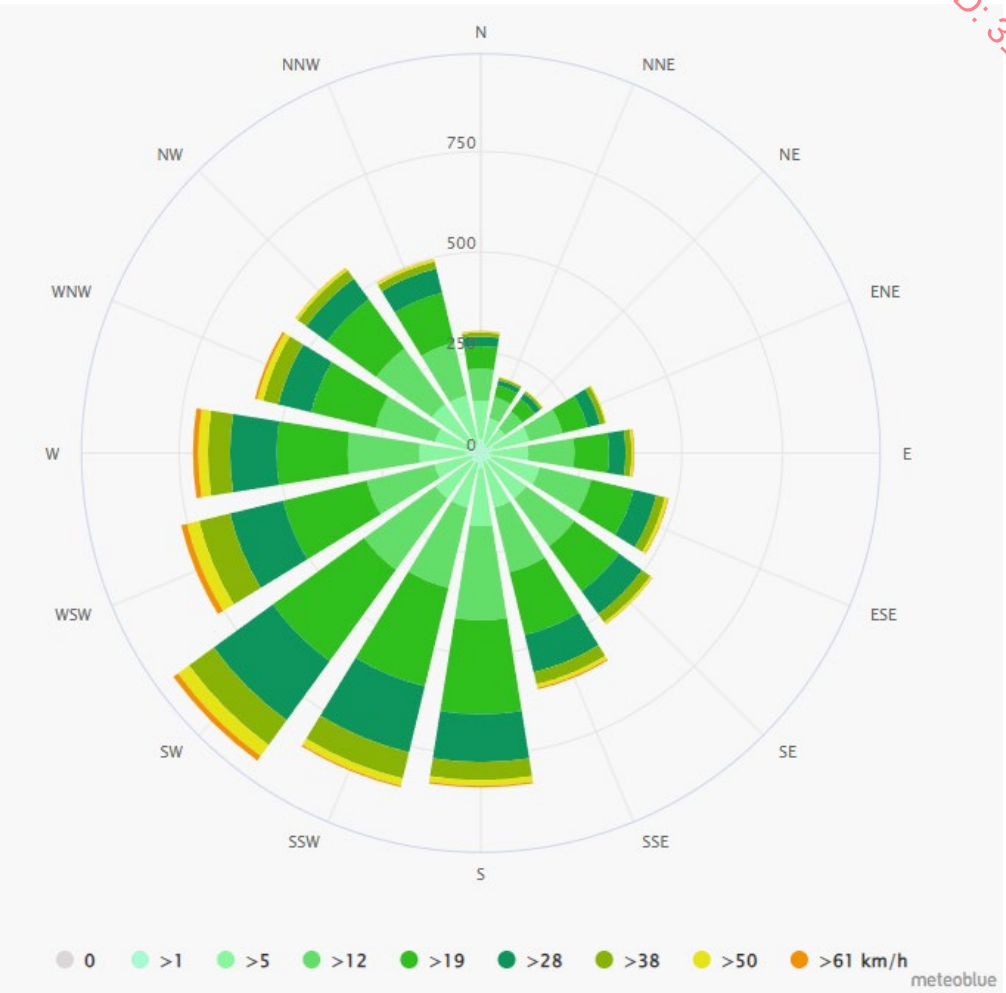
10.50 With respect to wind data from Claremorris weather station was used to be obtain a Windrose that shows the frequency of winds greater than 2.5m/s and rainfall less than 0.2mm which a classed a potentially dusty wind under IAQM guidance. Met Eireann historical data (https://www.met.ie/climate/available-data/historical-data) was used to obtain hourly data on precipitation amount, mean wind speed and predominant wind direction from January 2014 to May 2024.

10.51 The frequency of exposure of each receptor is based upon the frequency of winds capable of carrying dust particles blowing in the direction, from the source to the receptor, on days when rainfall does not inhibit dust from becoming airborne.

10.52 A wind-rose for the site is presented in Figure 10.2 from Meteoblue.com for Claremorris Meteorological Station and illustrates the predominant wind directions from the south-west. The potential for the generation of airborne dust will increase with wind speed, with winds greater than 2.5 m/s capable of carrying airborne dust.

[5] https://www.sciencedirect.com/science/article/pii/S135223101200814X

Figure 10.2: Windrose for Claremorris (Meteoblue.com)



10.53 A detailed methodology is provided in Appendix A- Methodology. Figure 10.A1 in Appendix 1 shows a Windrose showing the frequency of potentially dusty winds.

Dispersion Modelling

IAQM and PAN 50 Guidance

10.54 The Institute of Air Quality Management (IAQM), in its 2016 guidance on the Assessment of Mineral Dust Impacts for Planning, notes that detailed dispersion modelling is not generally recommended for mineral extraction sites due to the lack of reliable sector-specific emission factors. Instead, the IAQM promotes a qualitative, risk-based approach using the Source-Pathway-Receptor (S-P-R) framework, which is more suited to dust assessments in this sector.

10.55 Similarly, Planning Advice Note 50 (PAN 50)[6] highlights the inherent uncertainties in predicting dust emissions from mineral workings, given the variations in meteorology and site

[6] **Scottish Government (1996)**, Planning Advice Note (PAN) 50 Annex B: Controlling the Environmental Effects of Surface Mineral Workings. Available from: https://www.gov.scot/publications/planning-advice-note-pan-50-controlling-environmental-effects-surface-mineral-workings/

topography. PAN 50 suggests that computer modelling can only provide crude predictions of dispersion patterns and recommends qualitative assessments coupled with ongoing monitoring as more effective in managing dust emissions from quarry operations.

Ongoing Dust Monitoring

10.56 Ongoing dust deposition monitoring at the quarry has consistently demonstrated that dust levels are well below the TA Luft limit of 350 mg/m²/day. The monitoring results indicate that dust emissions are being effectively controlled, further validating the conclusion that there has been no material change in air quality impacts since the previous assessment.

Conclusion

10.57 Given the consistent compliance with dust deposition standards and the IAQM and PAN 50 guidance discouraging detailed modelling for mineral extraction sites, dispersion modelling is not deemed necessary. The existing dust monitoring program, combined with the continued enforcement of mitigation measures, provides a sufficient basis for managing dust emissions effectively. Therefore, a qualitative risk-based approach will adequately address the air quality impacts of the current quarry operations.

10.58 This approach ensures ongoing compliance with environmental standards while accounting for the practical limitations of dispersion modelling in the context of mineral extraction.

Traffic Emissions

10.59 The Air Quality Assessment of Specified Infrastructure Projects – Overarching Technical Document (Publication number: PE-ENV-01106) published by Transport Infrastructure Ireland (TII) in December 2022 outlines the methodology for assessing air quality impacts associated with infrastructure projects. This document includes detailed guidance on screening criteria to determine if traffic changes due to a proposed scheme may affect air quality. The criteria for defining the affected road network (ARN) are as follows:

- Road alignment will change by 5 meters (m) or more; or
- Annual average daily traffic (AADT) flows will change by 1,000 or more; or
- Heavy duty vehicle (HDV) (vehicles greater than 3.5 tonnes, including buses and coaches) flows will change by 200 AADT or more; or
- Daily average speed change by 10 kph or more; or
- Peak hour speed will change by 20 kph or more.

Existing Environment

Site Location

10.60 The site to which the planning application relates is in the townland of Cregaree, Cong, Co. Mayo. The site is situated approximately 1km north of the village of Cong in County Mayo. The site is approximately 10km South-west of Ballinrobe, Co. Mayo and 15km north-west of Headford, while Galway is approximately 35km south-east of the site (Figure 10.1).

10.61 The application site is comprised of an existing operational limestone quarry, which is broadly rectangular in shape within an overall quarry site area of 62.45ha. The site is situated between the 20m and 30m contour lines, with higher ground immediately west of the application site, at Droingin Lair (53m above Ordnance Datum (OD)) and to the north-east at Drumsheel Lower (52m above OD).

10.62 Beyond the site, the landscape is rural in character, consisting of agricultural land enclosed with stone walls, with interspersed with scrub and large tracts of woodland, most notably Cong Woods, which are situated immediately to the south of the site. Field boundaries in the surrounding area are marked by treelines and hedgerows.

Proposed Development

10.63 The operation of the existing quarry site enables an evaluation of the potential impact of dust emissions as deepening is carried out. The planned quarry development will provide extraction of rock reserves within the current quarry boundary, significantly extending the quarry operational life.

10.64 Building stone will be removed using excavators and rock will be extracted by blasting means as it is presently undertaken at the existing quarry with occasional rock breaking required. The applicant proposes to extract rock from the application area down to a level of -12 mOD.

10.65 Blasted rock will continue to be removed by excavators and loaded onto dump trucks which will transport the material to the existing operational quarry for processing. Here the material will be processed into various grades of saleable aggregate and stockpiled on-site or used to manufacture concrete and asphalt products. Plant and machinery which will operate at the application site will include excavators, dump trucks, wheel loaders, drilling rigs, tractor and bowser.

Predicted Impacts on Air Quality

10.66 Day to day activities associated with quarrying activity can have the potential to give rise to elevated dust levels if activities associated with extraction and transportation of material are not managed correctly. As dust travels downwind from the source it disperses outwards and upwards and progressively falls to the ground surface, with larger particles settling first.

10.67 The primary sources of air emissions from the development will be related to plant and machinery operating across various activities, including, extraction, materials handling, and both on-site and off-site transportation of materials. Wind-blown dust can also arise under dry and windy conditions. Due to the high level of precipitation in the study area, dust generation is naturally suppressed. Potential impacts from these activities are primarily related to dust deposition and vehicle and plant emissions.

Drilling and Blasting of In-situ Material

10.68 In order to remove the underlying bedrock, blast holes must be first drilled using a blasting rig. This will be undertaken on average once per month and in response to the demand for

aggregate. Drilling rigs used are fitted with a dust and noise suppression system. Emission from drilling and blasting are generally relatively low and do not travel far from the source.

Transportation of Material

10.69 Emissions from vehicles travelling from the application area to the existing quarry can act as a source of emissions and can occur along the entire route. Vehicle movements on the internal access/haul roads are a source of dust nuisance as emissions can increase rapidly in proportion to vehicle speed and traffic volume. Research has shown that the majority of dust particles, typically produced from un-surfaced roads, deposit rapidly settles within 8m of the source.

Vehicle & Plant Emissions

10.70 Exhaust emissions resulting from plant and vehicles operating directly at the application area or indirectly by transporting material from the application area to the main quarry have the potential to contribute to local pollution levels, both within and surrounding the area. Carbon Dioxide (CO_2), Nitrous Oxide (N_2O) constitutes the main emissions from the plant and vehicles operating at the application area.

Receptors

10.71 The local environment surrounding the proposed development site comprises a range of ecological and human receptors that may be potentially impacted by changes to air quality. A description of the sensitive receptors located within 400m of the proposed development is shown below:

Human Receptors

10.72 Potential impacts on human receptors in proximity to the quarry site is assessed.

10.73 It has been found that deposited dust does not generally travel beyond 400 m (IAQM, Appendix 2, 2016), therefore all receptors within 400 m of the site boundary are included in the assessment. The guidance states that it is commonly accepted that the greatest impacts from particulates will occur within 100 m of the source, with the potential for travel up to 400m.

10.74 There approximately 18 residences within a 400-meter radius of the application site.

10.75 Table 10.4 shows the classification based on the direction and frequency of potentially dusty winds in relation to each of the receptors

Table 10.4 Receptor classification based on wind frequency

Receptor	Relevant Wind Direction (Based on Windrose)	Frequency of Potentially Dusty Winds	Frequency Classification
Group 1	200-240	17.99	Frequent
Group 2	240-300	16.76	Frequent
Group 3	310-350	6.07	Moderately Frequent
Receptor 4	30-70	4.00	Infrequent

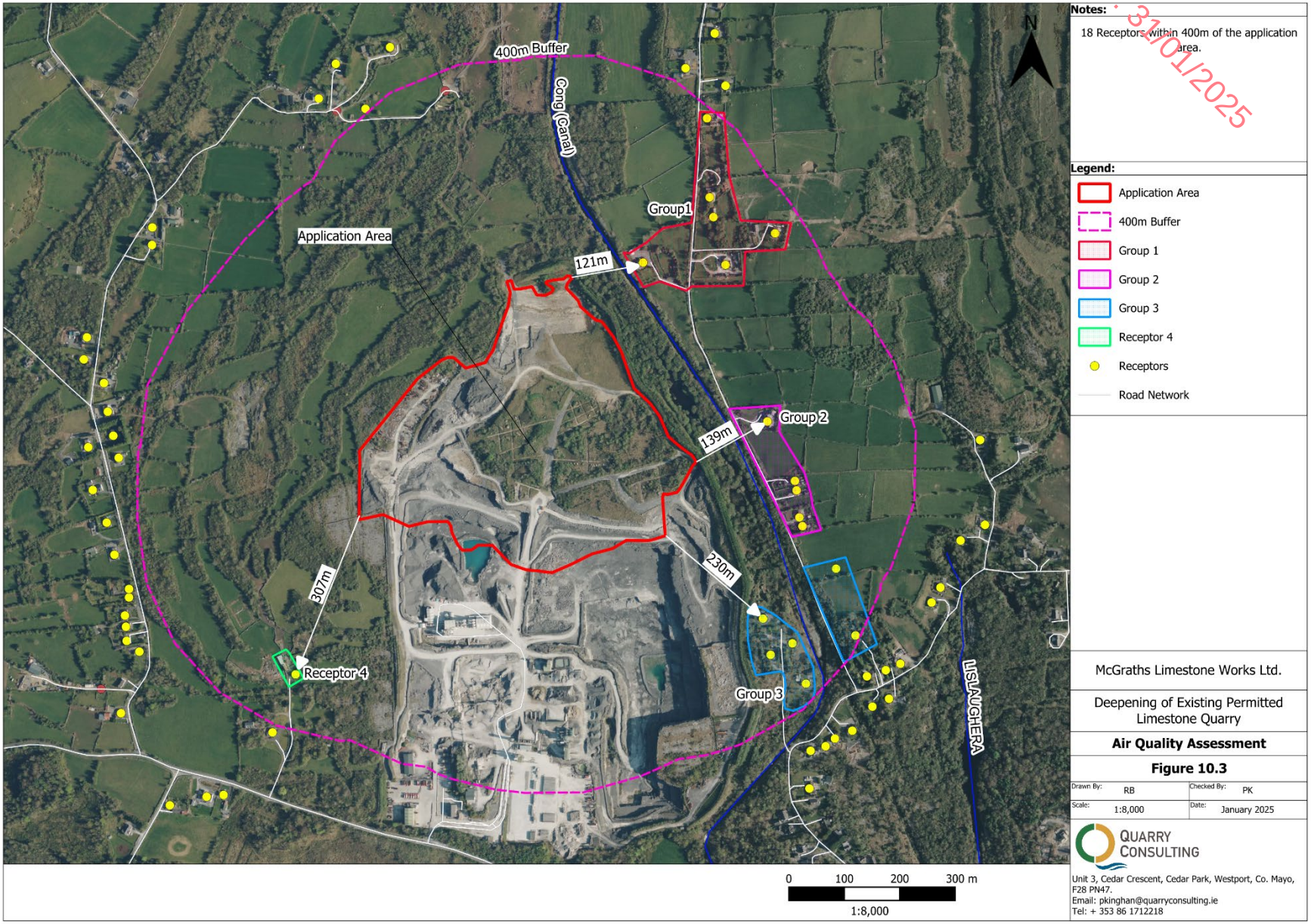
10.76 Table 10.5 below shows receptors within 400m of the proposed development which will be assessed. Receptor 4 is an individual receptor and the remaining receptors are grouped (1-3) and the closest receptor to the application boundary is assessed. Figure 10.3 shows the receptors within 400m of the application boundary.

Table 10.5 Categorisation of receptor distance

Receptor	Sensitivity	Distance (m) / Direction From Application Boundary (approx.)	Distance Category
Group 1	High	121m Northeast	Intermediate
Group 2	High	139m East	Intermediate
Group 3	High	230m Southeast	Distant
Receptor 4	High	307m Southwest	Distant

10.77 The frequency of potentially dusty winds and the distance from the application boundary is used to determine the pathway effectiveness.

Figure 10.3 Receptors assessed within 400m of the application boundary



Environmental Receptors

10.78 There are a number of Natura 2000 European designated sites within 5km of the application area. Table 10.6 shows the SACs and SPA located within 5km of the site.

Table 10.6 Distance of nearest ecological receptor

Receptor	SENSITIVITY	DISTANCE (M) / DIRECTION FROM APPLICATION BOUNDARY (APPROX.)
Lough Carra/Mask Complex SAC	High	1.1km West
Lough Corrib SAC/SPA	High	1.7km South
Lough Mask SPA	High	2.2km Northwest
Ballymaglancy Cave, Cong SAC	High	2.4km Southwest
Kildun Souterrain SAC	High	3.46km West

Receptor Sensitivity

10.79 There are four groups of receptors being assessed, all of which are classified as highly sensitive receptors as seen in The Institute of Air Quality Management: Guidance on the Assessment of Mineral Dust Impacts for Planning (2016):

> 'High Sensitivity Receptor:
>
> - 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 car showrooms.'

Dust Dispersion and Ecological Sensitivity

10.80 Research and operational guidelines indicate that significant ecological impacts due to dust deposition typically occur only at very high deposition rates, which are generally over 1 gram per square meter per day (1 g/m²/day).

10.81 This deposition rate significantly exceeds the upper limit recommended by environmental guidelines. The Department of Environment, Heritage and Local Government (DEHLG), along

with the Environmental Protection Agency (EPA)[7], has set the threshold for acceptable dust deposition rates for industrial sectors including extractive industries. According to the guidelines provided by the DEHLG and the EPA, the threshold is set at 350 milligrams per square meter per day (350 mg/m²/day). This limit is established to prevent any significant adverse ecological or human health impacts under typical operating conditions.

10.82 Dust deposition monitoring results presented in Table 10.8 below indicate that dust deposition rates for the quarry are below the recommended Bergerhoff limit value of 350 mg/m²/day averaged over 30 days and are within the recommended threshold limit value set out in the DoEHLG (2004), Quarries & Ancillary Activities: Guidelines for Planning Authorities and the EPA (2006), Environmental Management Guidelines: Environmental Management in the Extractive Industry (Non-Scheduled Minerals).

Baseline Conditions

Existing PM_{10} Concentrations

10.83 The proposed development is located in Air Quality Zone D – Rural Ireland. The Claremorris monitoring station is also located in air quality zone D, is a similar in terms of Pm_{10} concentrations to the development site and has a historic data for PM_{10} concentrations; therefore, it will be used to determine existing PM_{10} concentrations.

Table 10.7 PM_{10} concentrations from Claremorris monitoring station

Time period	Annual Mean Hourly PM_{10}Concentrations (µg/m^3)	Number of Days >50µg/m^3
2021	14.22	0
2022	14.63	0
2023	10.66	0
1st January 2024 - 10th June 2024	8.19	0

10.84 Table 10.7 illustrates that PM10 concentrations monitored at the Claremorris monitoring site are below the annual mean Air Quality Standards (AQS) of 40µg/m3 and comply with the requirement that a 24-hour mean of 50µg/m3 should not be exceeded more than 35 times in a calendar year.

10.85 In terms of whether the PM_{10} concentration in the local area is likely to exceed the AQS, the following information has been reviewed:

- existing PM10 concentrations; and

[7]Environmental Protection Agency (EPA), "Guidance on the Assessment of Dust from Demolition and Construction," EPA, 2016.

- expected additional contribution of PM10 from site operations.

10.86 In terms of estimating the potential magnitude of impact from site operations, a UK edition of the Local Air Quality Management Technical Guidance (TG22) from the Department for Environment Food & Rural Affairs stated that fugitive dust from stockpiles and pit operations can potentially contribute up to 5 μ g/m^3 towards annual mean background concentrations of the coarse fraction (2.5 – 10 μ m diameters) of particulates in the immediate area.

10.87 Given the nature and scale of existing activities, the potential PM10 impact of increased intake is considered to be lower than this. However, to ensure a robust assessment of potential PM10 impacts, the upper limit of 5 μ g/m3 has been applied to represent the development contribution to annual ambient PM10 concentrations. This value has then been added to existing background levels to assess whether the Air Quality Standards objective is likely to be exceeded.

Existing Dust Deposition

10.88 Monitoring to date includes all of the quarry operations. The monitoring at the site boundary demonstrates that deposited dust is within the guideline limits. Inspection of the quarry surrounds on various occasions show that there is no evidence of soiling or significant amounts of deposited dust on vegetation. There will be no significant effect or change as a result of the proposed development. Potential significant impact on residences from dust resulting from site operations is considered to be negligible.

10.89 Dust deposition monitoring is undertaken at 6 boundary locations of the quarry site (see Figure 10.4 – dust monitoring locations). A summary of the dust deposition monitoring results for 2023 and 2024 is shown in table 10.8 below.

Figure 10.4 Dust deposition monitoring locations

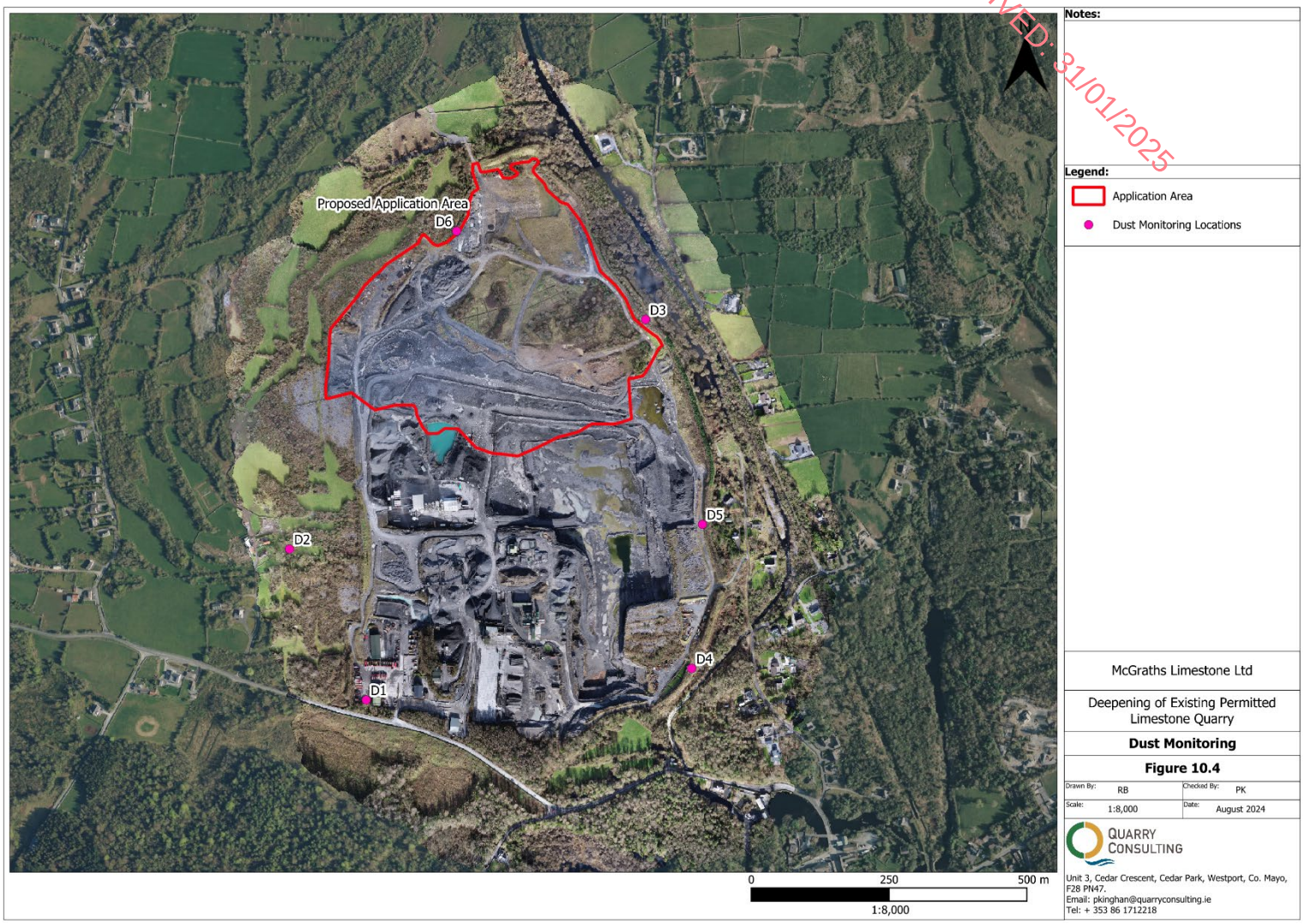


Table 10.8 Dust deposition averaged results for 2023

2023							
	Site Location						
Month	D1	D2	D3	D4	D5	D6	**Average Particulate**
April	93	85	147	123	129	190	128
August	133	171	89	147	35	21	99
December	**741**	132	185	46	105	14	204
Limit (mg/m2/day)	**350**	**350**	**350**	**350**	**350**	**350**	

Table 10.8 Dust deposition averaged results for 2024

2024							
	Site Location						
Month	**D1**	**D2**	**D3**	**D4**	**D5**	**D6**	**Average Particulate**
May	135	89	48	140	73	96	97
July	78	88	64	143	152	98	103
Limit (mg/m2/day)	**350**	**350**	**350**	**350**	**350**	**350**	

10.90 The results presented above indicate that dust deposition rates were typically below the recommended Bergerhoff limit value of 350 mg/m²/day averaged over 30 days and are within the recommended threshold limit value set out in the DoEHLG (2004), Quarries & Ancillary Activities: Guidelines for Planning Authorities and the EPA (2006), Environmental Management Guidelines: Environmental Management in the Extractive Industry (Non-Scheduled Minerals).

Impact Assessment

10.91 The construction, operational and restoration phases are included as part of the impact assessment due the potential for each of the phases to be occurring at the same time.

Dust Assessment

10.92 A summary of the risk assessment of dust impacts from sources within the proposed development is presented in Table 10.9 below.

Table 10.9 Summary of the impact assessment results (pre-mitigation)

Receptor	Source Emissions Risk	Pathway Effectiveness	Dust Impact Risk	Receptor Sensitivity	Magnitude of Dust Effect
Group 1	Medium	Moderately Effective	Low Risk	High	Slight Adverse Effect

Group 2	Medium	Moderately Effective	Low Risk	High	Slight Adverse Effect
Group 3	Medium	Ineffective	Negligible Risk	High	Negligible Effect
Receptor 4	Medium	Ineffective	Negligible Risk	High	Negligible Effect

10.93 From Table 10.8, it is observed that the risk of impact from dust emissions associated with the proposed development (without any mitigation measures in place) varies from slight adverse effect at group one and two and negligible effect at group three and receptor four.

10.94 Note that this does not take into account implementation of mitigation measures within the proposed development that include provision of perimeter screening berms, dust suppression measures etc. (outlined in the Mitigation Measures section below).

10.95 Table 10.9 below provides a detailed overview of potential dust impacts associated with specific operational activities within the proposed development, in accordance with EPA Guidelines (2022). This table categorises dust-generating scenarios by activity type, describing the nature and significance of each effect, as well as its expected extent, frequency, and likelihood.

10.96 Key activities assessed include:

- **Blasting and Extraction**: Emission from drilling and blasting are generally relatively low and do not travel far from the source. These operations are expected to produce dust emissions that may affect areas within 100 meters of the source, with dust potentially traveling up to 400 meters. Given the controlled nature of blasting, the probability of significant impact remains low, with dust effects generally localised and occurring, typically, on a monthly basis.
- **Stockpiling**: Dust from stockpiles has a slight negative effect and is primarily localised to within 100 meters of the source, with an unlikely probability of affecting areas up to 400 meters.
- **Haulage**: Vehicle movements on unpaved roads are identified as having a moderate impact on local air quality, as dust may be generated frequently.
- **Crushing and Screening**: Dust from material processing equipment is considered slight in magnitude, and is primarily localised to within 100 meters of the source, with an unlikely probability of affecting areas up to 400 meters.
- **Heavy-Duty Vehicle Traffic (Off-Site)**: Emissions from HDVs entering and exiting the site are expected to be imperceptible, with effects localised along transport routes and a low probability of significant air quality impact.

10.97 Table 10.9 provides a clear summary of the potential air quality impacts under each activity, setting the basis for targeted dust control measures to mitigate effects on sensitive receptors.

Table 10.9 Air Quality Impact Summary Table (Based on EPA Guidelines 2022)

Scenarios	Activity	Nature and Description of the Effect	Quality of Effect	Significance of Effect	Extent & Context of Effect	Probability of Effects	Duration and Frequency
Restoration	Site preparation/restoration	Dust emissions from soil movement and heavy plant operations	Negative	Slight	Local impact within 100 m, potential for travel up to 400 m	Unlikely	Long-term, occasional
Quarry Operations (Blasting and Extraction)	Blasting and extraction	Dust emissions from blasting and material handling	Negative	Slight	Local impact within 100 m, potential for travel up to 400 m	Unlikely	Long-term, monthly
Materials Handling	Material handling	Dust generated by plant on uneven surfaces	Negative	Slight	Localised to quarry void area	Unlikely	Long-term, frequent
On-site Transportation	Haulage	Dust from vehicle movements on unpaved haul roads	Negative	Slight	Local, along internal haul routes	Unlikely	Long-term, frequent
Mineral Processing	Crushing and screening	Dust emissions from crushing and screening equipment	Negative	Slight	Local impact within 100 m, potential for travel up to 400 m	Unlikely	Long-term, occasional
Stockpiling Materials On-Site	Stockpiling	Dust from stockpiled materials	Negative	Slight	Local impact within 100 m, potential for travel up to 400 m	Unlikely	Long-term, occasional

Scenarios	Activity	Nature and Description of the Effect	Quality of Effect	Significance of Effect	Extent & Context of Effect	Probability of Effects	Duration and Frequency
Off-site Transportation	HDV traffic	Emissions from heavy-duty vehicles on paved roads	Negative	Not significant	Local, along transport routes	Unlikely	Long-term, Frequent

PM_{10} Assessment

10.98 In terms of PM10, the maximum annual mean measured baseline background concentration was 14.63 μ g/m³ in 2022 at Claremorris monitoring station. The potential contribution up of 5 μ g/m³ towards annual mean background concentrations of the coarse fraction (2.5 – 10 μ m diameters) of particulates (in the immediate area of the site) is considered to be insignificant and well below the annual objective of 40 μ g/m³.

10.99 Therefore, the potential impacts in relation to increase in ambient PM_{10} concentrations can be classified as 'negligible'.

Traffic Emissions Assessment

10.100 For the purposes of assessment, no significant changes to traffic movements, road alignment or speed are proposed. This represents no change to the current situation.

10.101 Therefore, as none of the roads in the surrounding road network meet any of the traffic / alignment criteria set out in the TII 2022 Air Quality Assessment of Specified Infrastructure Projects – Overarching Technical Document, then the impact of the scheme can be considered to be 'negligible' in terms of local air quality and no further air quality assessment is deemed necessary.

10.102 On this basis, the impact of the proposed quarry deepening from the change of HDVs traffic can be screened out and combustion emissions (primarily oxides of nitrogen) from vehicle exhaust emissions associated with the transportation of materials will not have the potential to contribute to local air pollution.

Mitigation Measures

Existing Mitigating Features

Existing Screening Berms, Hedgerows and Trees

10.103 The presence of established hedgerows and trees in the vicinity of the quarry site provides a degree of natural shielding against the dispersion of dust emissions downwind of the prevailing winds. These vegetation features act as physical barriers that can help intercept and trap airborne particulate matter, thereby reducing the extent to which dust travels beyond the immediate operational area. There is an existing berm located to the northeast of the application area that has an elevation level of 23 mOD, which is approximately 8m higher than the ground level. In addition there are existing landscaped screening berms, trees and hedgerows surround the application area to the west, north and east. However, it is acknowledged that while hedgerows and trees contribute to dust mitigation, their effectiveness may vary based on factors such as wind direction, foliage density, and the particle size of the emitted dust.

Topography

10.104 Topography is a significant factor with respect to dust dispersal. There is a substantial change in level between the principal sources of dust within the quarry excavation and sensitive receptors. These receptors are at a much higher elevation compared to the principal sources of dust i.e. processing and stockpiling. The difference in elevation between the main sources and the receptor acts as a physical barrier to wind. It provides an effective barrier to winds for nearby receptors and reduces significantly any airborne concentrations.

Mitigation Adequacy

10.105 The presence of hedgerows, trees, and changes in elevation offers initial mitigating effects on dust emissions from the proposed quarry deepening. While these features contribute to reducing dust dispersion, it is prudent to acknowledge that they might not provide complete containment. Thus, the effect of hedgerows, trees and topography of the dispersion of dust will not be included in this assessment to ensure a conservative approach.

Site Specific Mitigation Measures

10.106 Table 10.10 shows the site-specific mitigation measures for the proposed development.

Table 10.10 Proposed mitigation measures

Source	Emission Potential	Mitigation Measures	Effectiveness
Excavators/HDV	High – dry or fine material during strong windy weather	Minimise drop heights when handling materials. Avoid working in adverse/ windy conditions.	High
	Low – material of high moisture content during conditions of low wind speed		High
Onsite Vehicles	High when travelling over un-surfaced and dry site roads	Minimise distances of onsite haul routes.	High
		Use of water sprays / tractor & bowser to moisten surfaces during dry weather.	High
		Restrict vehicle speeds through signage / staff training.	High
		Location of haul routes away from sensitive receptors.	High
Road Vehicles **(transfer offsite)**	Low / Moderate on paved road surfaces	Use of road sweeper to reduce the amount of available material for re-suspension.	High
		Existing paved access road and wheelwash (with side and overhead spray bars)	High
Stockpiles	High when dry or fine material being stored	Located within quarry void	High

	or handled during strong windy weather	Limit mechanical disturbance.	High
Processing Plant	High – during dry and strong windy weather	Retention of hedgerows	High
		Existing landscaped perimeter berms with a height of approx. 8m	High
		Avoid working in adverse weather conditions	High
		Locate plant within quarry void	High
		Screening berms seeded and planted	High

Residual Impacts

10.107 With the range of mitigation measures to be implemented and design measures to be incorporated into the working scheme, it is considered that the risk of dust impact at receptors from the proposed development reduces further.

10.108 After an assessment of potential adverse effects produced by the development it was concluded that there would be no significant adverse air quality effects for both human and ecological receptors. Table 10.11 shows a summary of the residual air quality impact.

Table 10.11 Residual Air Quality Impact Summary Table (Post-Mitigation)

Scenarios where impacts may arise	Activity	Nature and Description of the Effect	Residual Significance of Effect	Probability of Residual Effects
Site Preparation and Restoration	Site preparation/restoration	Dust emissions from soil movement and heavy plant operations	Not significant	Unlikely
Quarry Operations (Blasting and Extraction)	Blasting and extraction	Dust emissions from blasting and material handling	Not significant	Unlikely
Materials Handling	Material handling	Dust generated by plant on uneven surfaces	Not significant	Unlikely
On-site Transportation	Haulage	Dust from vehicle movements on unpaved haul roads	Not significant	Unlikely
Mineral Processing	Crushing and screening	Dust emissions from crushing and screening equipment	Not significant	Unlikely
Stockpiling Materials On-Site	Stockpiling	Dust from stockpiled materials	Not significant	Unlikely
Off-site Transportation	HDV traffic	Emissions from heavy-duty vehicles on paved roads	Not significant	Unlikely

Cumulative Impacts

10.109 The cumulative impacts are those which result from incremental changes caused by other past, present or reasonably foreseeable actions together with the proposed development. Therefore, the potential impacts of the proposed development cannot be considered in isolation but must be considered in addition to impacts already arising from existing or planned development. The application site is located to the north of the main quarry where all material extracted from the application area will be processed.

Main Quarry

10.110 Processed material will be sold as aggregate or used to manufacture lime, ready-mix concrete and asphalt products. Material is also extracted from the main quarry. This area of the quarry

is also a potential source of emissions to air due to the number processes undertaken. The impacts detailed above such as extraction and transportation would also relate to this area of the quarry, however, material will only be extracted from one area of the quarry at any one time i.e. from the application area or the main quarry. The impacts associated with the main quarry are from the following activities; Processing activities, manufacturing and transportation of material.

Processing Activities

10.111 Material extracted is processed at the main quarry using crushers and screeners. The majority of material is unloaded directly into the fixed processing plant which crushes the material and directs the crushed material via a conveyor belt to the screening plant which separates the aggregate into various grades and stockpiles accordingly around the screening plant.

10.112 There is a potential for the release of dust when material is unloaded into the crusher bin and during crushing and screening of material. Aggregate stockpiled at the end of each conveyor is also a potential source of dust blow during dry windy conditions. The processing area is located in a relatively sheltered area close to an existing quarry face which is approximately 10m in height. This provides shelter from prevailing winds which could potentially pick up dust and transport around and off-site. The closest residential dwelling to the processing area is approximately 375m to the west. Due to the distance of the processing from this location and due elevated area between both, it is unlikely that there has been an impact on air quality in the past and this is anticipated to be the case going forward. This is reflected in dust monitoring results to date.

Manufacturing

10.113 The manufacturing of quarry related materials such as lime, concrete and asphalt is unlikely to lead to significant levels of air emissions as material used for the production of these products are stored in bins with the product loaded directly into vehicles used to transport the material. Emissions to air associated with products would mainly be associated with the transport of these products to market.

10.114 The asphalt plant located in this area of the quarry operates in line with an air emissions licence granted by Mayo Co. Co. with results of monitoring submitted as part of an AER on an annual basis. In 2016, planning permission was granted by Mayo County Council (Reference No.P16/200) for an upgrade to the asphalt plant at the existing quarry. This upgrade was undertaken in line with McGrath's policy to reduce emissions and energy costs.

Transportation of Material

10.115 The transport of material from the application site to the main quarry and off-site can generate windblown dust associated with traffic travelling over paved and unpaved surfaces. However, as detailed above, the majority of dust particles typically produced from un-surfaced roads, deposit rapidly within 8m of the source. Although there were exceedances in the last 12 years at dust monitoring location D5 which is located along a haul road, it is unlikely that dust migrated a significant distance from the site. Haul roads are dampened down during dry windy conditions to prevent dust blow. Material which has the potential to be carried in wind or deposited from vehicles such as lime is covered with a tarpaulin during transport from the quarry to the destination.

Other Developments

10.116 There are two other quarries located in the vicinity of the site with one located approximately 0.9km to east and another located 1.9km to the northeast. Both quarries are in the region of

1.5 hectares in area and are subject to rock extraction and processing on a small scale basis. Due to the low level of extraction, it is unlikely that there would be an in-combination impact associated with these developments.

10.117 Baseline dust deposition monitoring carried out at the existing development, consistently complies with the recommended dust deposition emission limit value of 350 mg/m^2/day (averaged over 30 days).

10.118 There have been no reported issues concerning dust dispersion or related environmental impacts with the existing quarry operations. This provides a benchmark and precedent that demonstrates effective management and mitigation measures have been implemented and can continue to be upheld as the quarry deepens.

10.119 The cumulative impact of the proposed development will be not significant.

'Do Nothing Scenario'

10.120 In the Do-nothing scenario, the existing quarry operations are to be maintained at existing levels. From an air quality perspective, no significant changes in air quality are expected. Therefore, it should be noted that this proposal and current operations are similar in nature.

Conclusion

10.121 On the basis of the assessment presented above, it is concluded that the proposed development, with the range of mitigation measures to be implemented and design measures incorporated into the working scheme, will not have a dust deposition impact on any assessed receptors.

Monitoring Program

10.122 Dust monitoring locations shall be reviewed and revised where and as/when necessary. The results of the dust monitoring will be available for public inspection at the office of the quarry and shall be submitted to Mayo County Council on request.

Appendix 10.A – Methodology

Methodology

10.123 The section elaborates on the IAQM Guidance on the Assessment of Mineral Dust Impacts for Planning (2016) employed to evaluate the effects of deposited dust and fine particulates stemming from extraction activities. This approach adheres to a conventional methodology involving source-pathway-receptor considerations. This report followed the guidelines as part of the assessment.

10.124 The residual source emissions are characterised based on the scale of the operations and the site activities and are classified as either small, medium or large.

10.125 Directions regarding the suitable categorisation of the residual source are outlined in the IAQM guidance, specifically outlined in Appendix 4 from 2016. This characterisation of the source encompasses an evaluation of the standard management and mitigation measures that will be executed at the site.

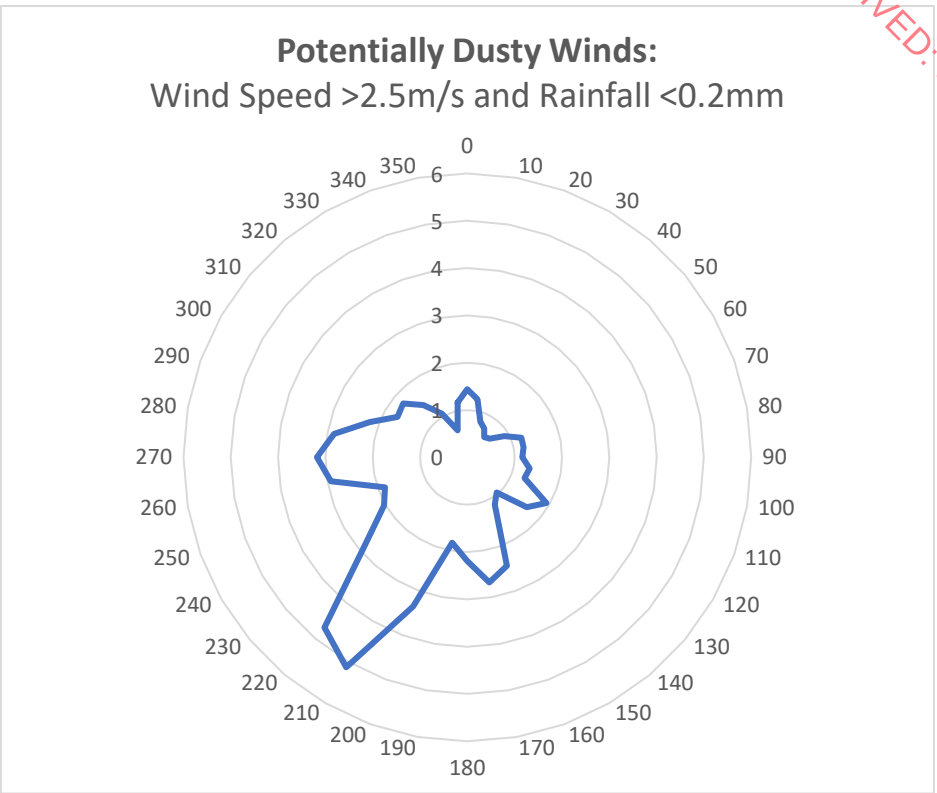
10.126 The evaluation of the pathway from the source to the receptor involves an assessment that considers the distance and orientation of receptors in relation to the prevailing wind and local meteorological conditions. Local meteorological data is also employed to appraise the frequency of winds in each direction. Research findings indicate that deposited dust typically doesn't disperse beyond 400 meters (IAQM, Appendix 2, 2016), thus all receptors located within 400 meters of the site boundary are taken into consideration. The guidance asserts that it's widely accepted that the most significant impacts will manifest within 100 meters of the source, with the potential for dispersion up to 400 meters.

10.127 The criteria utilised for categorising the frequency of potentially dusty winds (Table 10.A2) and the distance between receptors and the source (Table 10.A3) are employed to define the effectiveness of the pathway (Table 10.A4). The residual source emissions and pathway effectiveness are combined to anticipate the potential Dust Impact Risk, as illustrated in Table 10.A5.

Windrose data

10.128 Hourly data from Met Eireann taken from January 2014 to August 2024 was used to generate a Windrose (Figure 10.A1) that shows the frequency of potentially dusty winds at Claremorris weather station. Potentially dusty winds are classed as having wind speeds greater than 2.5m/s and less than 0.2mm of rainfall as per IAQM guidelines.

Figure 10.A2: Potentially dusty winds from Claremorris weather station



Source Emissions Classification

10.129 Table 10.A1 is extracted from the IAQM Guidance on the Assessment of Mineral Dust Impacts for Planning. The guidance provides the factors that may be considered when determining if the source emissions will have a small, medium or large risk. The Dust Impact Risk was determined for each of the main operational activities:

10.130 The classification was determined based on the following reasons as per the IAQM 2016 guidance document:

Site Preparation/Restoration:

- The area for site preparation/restoration will include an area <10ha, bunds <8m in height, <10 heavy plant machinery simultaneously active. Therefore, site preparation/restoration is classified as medium risk.

Mineral Extraction:

- The mineral extraction area will be less than 10 hectares, with the volume of material extracted proportionate to the operational needs of the quarry over its 25-year lifespan. Therefore, mineral extraction is classified as small-medium risk.

Materials Handling:

- The material handling will take place within the quarry void which would suggest a small risk but there will be >5 plant machinery and the ground will be poorly surfaced. Therefore materials handling is classified as small-medium risk.

On-site Transportation:

- The haul roads within the proposed development will be unpaved and have high a road surface of high dust potential. There will be <250 movements of heavy duty vehicles in one day and there will be a maximum speed limit of 15km/h in place on all haul roads. Therefore, on-site transportation is classified as medium risk.

Mineral Processing:

- The volume of rock processed annually will align with the operational needs of the quarry over its lifespan, utilising a mobile crusher and screener with effective design in dust control. Therefore, mineral processing is classified as small-medium risk.

Stockpiles/Exposed Surfaces:

- The stockpiles will be kept within the quarry void and below the existing ground level. The stockpiles will be located >100m from the site boundary. Therefore, stockpiles/exposed surfaces are classified as medium risk.

Off-Site Transportation

- The existing paved access road will continue to be used, along with the existing vehicle clean facilities and the access road is >50m in length. Therefore, offsite transportation is classified as medium risk.

10.131 For the assessment, it is assumed that each of the activities will be classified as medium risk and the distances will be taken from the site boundary and not the location of the individual site activity (see table 10.A1). This is a conservative approach in conducting the assessment.

Table 10.A1 Source emissions risk

Activity	Source Emissions Risk
Site Preparation and Restoration	Medium
Mineral Extraction	Small-medium
Materials Handling	Small-medium
On-site Transportation	Medium
Mineral Processing	Small-medium
Stockpiles and Exposed Surfaces	Medium
Off-site Transportation	Medium

Frequency of Potentially Dusty Winds

10.132 Table 10.A2 is extracted from the IAQM Guidance on the Assessment of Mineral Dust Impacts for Planning. It shows the categorisation of the frequency of potentially dusty winds. Potentially dusty winds are winds that occur at greater than 2.4m/s and the rainfall is less than 0.2mm.

Table 10.A2 Categorisation of frequency of potentially dusty winds

Frequency Category	Criteria
Infrequent	Frequency of winds (>2.4 m/s) from the direction of the dust source on dry days are less than 5%
Moderately frequent	The frequency of winds (>2.4 m/s) from the direction of the dust source on dry days are between 5% and 12%
Frequent	The frequency of winds (>2.4 m/s) from the direction of the dust source on dry days are between 12% and 20%
Very frequent	The frequency of winds (>2.4 m/s) from the direction of the dust source on dry days are greater than 20%

Receptor Distance from Application boundary

10.133 Table 10.A3 shows the categories for distance from the application boundary to the receptor.

Table 10.A3 Distance categories from the application boundary

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

Pathway Effectiveness

10.134 The pathway effectiveness (table 10.A4) is determined using the frequency of potentially dusty winds and the receptor distance from the application boundary.

Table 10.A4 Pathway effectiveness

		Frequency of Potentially Dusty Winds			
		Infrequent	**Moderately Frequent**	**Frequent**	**Very Frequent**
	Close	Ineffective	Moderately effective	Highly effective	Highly effective

Receptor Distance Category	**Intermediate**	Ineffective	Moderately effective	Moderately effective	Highly effective
	Distant	Ineffective	Ineffective	Moderately effective	Moderately effective

Estimation of Dust Impact Risk

10.135 The dust impact risk (table 10.A5) is determined using the source emissions risk and the pathway effectiveness.

Table 10.A5 Dust impact risk

		Source Emissions Risk		
		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

Descriptors for Magnitude of Dust Effects

10.136 The magnitude of dust effects is determined using the sensitivity of the receptor. Table 10.A6 shows the magnitude of the dust effects.

Table 10.A6 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