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## Introduction

### Background

- 8.1 This Chapter of the Environmental Impact Assessment Report (EIAR), prepared by SLR Consulting Ireland, addresses the potential effects of the proposed development at the existing sand and gravel pit at Baltrasna, Murrrens and Annagh townlands, Oldcastle, Co. Meath. The overall sand and gravel pit site is familiarly known and referred to as the Murrrens.
- 8.2 The proposed development will have the potential to generate fugitive dust emissions and particulates (PM<sub>10</sub>), which may result in impacts on local air quality. Combustion emissions (primary PM<sub>10</sub>, and oxides of nitrogen) from vehicle emissions associated with the transportation of materials also have the potential to impact on local air pollution.
- 8.3 Full details on the proposed development, site activities, environmental management systems and controls at the application sites are provided in the Chapter 2 of this EIAR.
- 8.4 The main elements of the the proposed development assessed with respect to air quality are:
- Extraction of sand and gravel (dry working) over a lateral extension extraction area of c. 4.2 hectares adjacent to the existing sand and gravel pit development permitted by planning permission KA/141129 (ABP PL17.245257) with access gained from the existing pit.
  - Restoration of the lands will form part of the overall adjacent sand and gravel pit restoration site, returning the lands to a combination of agricultural grazing and beneficial ecological habitat.
  - All associated site ancillary works within an overall application area of c. 5.8 hectares.

### Scope of Work

- 8.5 This chapter of the EIAR assess the effects of the proposed development on air quality, comprising fugitive emissions of dust and emissions from vehicles on the public road network.
- 8.6 This assessment has been informed by the Environmental Protection Agency's (EPAs) 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' (the 'EIAR guidance').
- 8.7 With respect to the potential for air quality impacts, the key objective at the application site is to manage activities to ensure that emissions to air are prevented where possible, and the effects of any residual releases minimised.

### Consultations / Consultees

- 8.8 A telephone pre-planning consultation meeting was held between an official of Meath County Council and SLR on the 21<sup>st</sup> October 2024.
- 8.9 In addition a pre-planning consultation document was issued to statutory consultees (see Chapter 1 for a list of consultees and responses received). There were no consultee responses with regard to the scope or methodology of the assessment of air quality impacts.
- 8.10 Feedback of most relevance to the assessment of air quality was received from the HSE Environmental Health Services.
- 8.11 The HSE comments were made in relation to environmental health protection and it noted that *"The EIAR should identify the air pollutants of public health concern in each of the phases of the proposed development. The generation of Dust during operations and the potential*

*impact on sensitive receptors should be addressed in the EIAR including mitigation measures needed to protect sensitive receptors.*

- 8.12 Following this, and a review of published development plans / site surveys, it was considered that there was no requirement for any further formal external consultations to be carried out in respect of air quality for the purposes of this assessment. There was however significant consultation with other specialist contributors to this EIAR.

### Contributors / Author(s)

- 8.13 The air quality impact assessment presented in this Chapter was prepared by SLR Consulting Ireland. The lead consultant for the study was Rachel McHale (Principal Air Quality Consultant) with support from Matthew Mitchell (Principal Air Quality Consultant). Both consultants are Members of the Institute of Air Quality Management (MIAQM).

### Limitations / Difficulties Encountered

- 8.14 This assessment is compiled based on published regional and local data, guidance documents, and site-specific field surveys.
- 8.15 The dust assessment is primarily a tool to identify the proportionate level of mitigation required.
- 8.16 Resultant effects ultimately depend on the effective application of the recommended mitigation. Therefore, there can be uncertainty on the representativity of the assessment procedure and associated post-mitigated outcomes if appropriate mitigation is not secured.
- 8.17 It is assumed that mitigation measures set out within the assessment would be secured should planning consent be granted.

### Regulatory Background

- 8.18 The following sections describe the main legislative policy requirements in respect of air quality associated with the proposed development.

### Legislation

#### Air Quality Standards

- 8.19 The Ambient Air Quality Standards Regulations (AAQSR) 2022<sup>1</sup> in Ireland set out the framework for monitoring and managing air quality in accordance with European Ambient Air Quality Directive (2008/50/EC) and its daughter directives, which aim to protect human health and the environment.
- 8.20 The AAQSR sets out a framework for reducing hazards to health from air pollution and ensuring that international commitments are met in Ireland.
- 8.21 The AAQSR sets standards and objectives for ten priority pollutants. Standards establish concentrations of pollutants in the atmosphere which can broadly be taken to provide a certain level of environmental quality. Objectives are policy targets, often expressed as maximum concentrations, not to be exceeded (either without exception, or with a limited number of exceedances within a specified timescale).
- 8.22 Monitoring stations across the country assess air quality, ensuring compliance with EU directives and providing public access to data.

<sup>1</sup> <https://www.irishstatutebook.ie/eli/2022/si/739/made/en/print>

8.23 The relevant standards applied in this assessment for the protection of human health are provided in **Table 8-1**, these are collectively termed Air Quality Assessment Levels (AQALs) throughout this report.

**Table 8-1: Applied Air Quality Assessment Levels (AQALs)**

Pollutant	Limit, Target Value or Objective			
	Averaging Period	Value	Maximum Number of Allowed Occurrences	Source
Nitrogen Dioxide (NO <sub>2</sub> )	1-hour	200 µg/m <sup>3</sup>	18	AAQSR
	Annual	40 µg/m <sup>3</sup>	0	AAQSR
Particulate matter with aerodynamic diameter of less than 10 µm (PM <sub>10</sub> )	24-hour	50 µg/m <sup>3</sup>	35	AAQSR
	Annual	40 µg/m <sup>3</sup>	0	AAQSR
Particulate matter with aerodynamic diameter of less than 2.5 µm (PM <sub>2.5</sub> )	Annual	20 µg/m <sup>3</sup>	-	AAQSR

8.24 The AQALs for human health should be assessed at locations where members of the public are likely to be regularly present and are likely to be exposed for a period appropriate to the averaging period of the AQAL. Thus, short-term standards, such as the 1-hour mean standard, should only apply to footpaths and other areas which may be regularly frequented by the public. Longer term standards, such as annual means, should apply at houses or other locations which the public can be expected to occupy on a continuous basis (examples are presented in **Table 8-2**).

**Table 8-2: Relevant Public Exposure**

Averaging Period	Relevant Locations	Standards should apply at:	Standards don't apply at:
Annual mean	Where individuals are exposed for a cumulative period of six months in a year	Building facades of residential properties, schools, hospitals etc.	Facades of offices Hotels Gardens of residences Kerbside sites
24-hour mean	Where individuals may be exposed for eight hours or more in a day	As above together with hotels and gardens of residential properties	Kerbside sites where public exposure is expected to be short term
1-hour mean	Where individuals might reasonably be expected to spend one hour or longer	As above together with kerbside sites of regular access, car parks, bus stations etc.	Kerbside sites where public would not be expected to have regular access

8.25 Regarding ecological receptors sites of nature conservation importance at a European, national and local level are provided environmental protection with respect to air quality.

EPA guidance<sup>2</sup> on consideration of designated ecological sites defers to methodology outlined in the UK publication “AQTAG06 – Technical Guidance on Detailed Modelling Approach For An Appropriate Assessment For Emissions To Air”. Standards for the protection of ecological receptors are known as Critical Levels ( $C_{Le}$ ) for airborne concentrations and Critical Loads ( $C_{Lo}$ ) for deposition to land from air.

### Nuisance (Dust Deposition)

- 8.26 There are currently no Irish, European Union (EU) or World Health Organisation (WHO) statutory standards or limits appropriate for the assessment of deposited dust and its propensity to generate a nuisance.
- 8.27 When the rate of accumulation of the coarser fraction of dust (referred to as deposited dust) is sufficiently rapid to cause fouling or discolouration, then it is generally considered to introduce a nuisance. The point at which an individual perceives dust deposition as a nuisance is highly subjective.
- 8.28 A range of monitoring techniques exists for dust deposition rates (i.e., Bergerhoff and Frisbee gauges).
- 8.29 In lieu of statutory limits, guidelines do exist as industry standard criteria levels for the gravimetric assessment of dust deposition from the extractive industry in Ireland as set out in the DoEHLG (2004) planning guidelines for the extractive industry, the ICF Guidelines (2005) and EPA (2006) Environmental Management Guidelines. Each of these Guidelines recommend the use of the Bergerhoff method for measuring dust deposition. In line with this approach, the guidelines recommend the dust deposition limit value of 350 mg/m<sup>2</sup>/day (total dust deposition averaged over a 30-day period), measured at site boundaries.

## Planning Policy and Development Control

### National Spatial Strategy (NSS) / National Planning Framework – Project Ireland 2040

- 8.30 The National Planning Framework 2040 (published in February 2018) is a national planning framework for Ireland. The framework provides the policies for all regional and local plans.
- 8.31 Air Quality is referenced in National Policy Objective 64 where it is stated:  
*“Improve air quality and help prevent people being exposed to unacceptable levels of pollution in our urban and rural areas through integrated land use and spatial planning that supports public transport, walking and cycling as more favourable modes of transport to the private car, the promotion of energy efficient buildings and homes, heating systems with zero local emissions, green infrastructure planning and innovative design solutions”*
- 8.32 The air quality objectives assessed according to industry accepted methodology for EIA are identified in **Table 8-1**.

### Local Planning Policy – Meath County Development Plan 2021 – 2027

- 8.33 The current Meath County Development Plan (CDP) sets out their overarching planning principles in relation to management of air pollution. The original plan adopted in 2021 has been superseded by the Consolidated version of the Development Plan which includes variations adopted in May 2024 and January 2025. Policies of relevance to this assessment include the following:

<sup>2</sup> Environmental Protection Agency Office of Environmental Enforcement (OEE) (2019) Air Dispersion Modelling from Industrial Installations Guidance Note (AG4)

- **Policy RD POL 22:** To facilitate the exploitation of the county's natural resources and to exercise appropriate control over the types of development taking place in areas containing proven deposits, whilst also ensuring that such developments are carried out in a manner which would not unduly impinge on the visual amenity or environmental quality in the area.
- **Policy RD POL 23:** To support the extractive industry where it would not unduly compromise the environmental quality of the county and where detailed rehabilitation proposals are provided.
- **Policy RD POL 27:** To ensure that development for aggregates / mineral extraction, processing and associated processes does not significantly impact in the following areas:
  - i. Existing & Proposed Special Areas of Conservation (SACs);
  - ii. Special Protection Areas (SPAs);
  - iii. Natural Heritage Areas and Proposed Natural Heritage Areas;
  - iv. Other areas of importance for the conservation of flora and fauna;
  - v. Areas of significant archaeological potential;
  - vi. In the vicinity of a recorded monument, and; Sensitive landscapes.
  - vii. World Heritage Sites

## Assessment Guidance

8.34 The air quality assessment has been carried out with reference to the principles contained within the following guidance documents:

- Air Quality Assessment of Proposed National Roads – Standard (Transport Infrastructure Ireland TII Publications);
- Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities (DoEHLG, 2010);
- Design Manual for Roads and Bridges (DMRB), Volume 11, Section 3, Environmental Assessment Techniques (UK Highway Agency, 2019);
- Environmental Code 2<sup>nd</sup> Edition (Irish Concrete Federation, 2005);
- Environmental Management in the Extractive Industry (Non-Scheduled Minerals). (EPA, 2006);
- Guidelines for Assessment of Ecological Impacts of National Road Schemes (Transport Infrastructure Ireland, 2009);
- Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes (NRA, 2011);
- Guidance on the Assessment of Mineral Dust Impacts for Planning (IAQM, 2016); and
- Quarries & Ancillary Activities – Guidelines for Planning Authorities (DoEHLG, 2004).

## Receiving Environment

### Study Area

8.35 The surrounding land use to the northwest and west of the site is dominated by the existing BD Flood sand gravel pit and associated processing and storage facilities. The western area

of the overall sand and gravel pit is exhausted of resources and partly restored and also contains a precast concrete factory.

- 8.36 The application site is an area of previous plantation woodland located immediately adjacent and southeast / east of the existing sand and gravel pit development permitted by planning permission KA/141129 (ABP PL17.245257).
- 8.37 A third-party quarry site is located immediately to the north of the site. The south and east of the site is bounded by a further block of plantation woodland and pastoral farmland.
- 8.38 The character of the wider area is predominantly agricultural, interspersed with other small blocks of plantation woodland and small lakes. Small rural settlements and isolated farmsteads are scattered along the local road network. The regional R195 route is a dominant feature to the east of the site.
- 8.39 There are few residences in the immediate vicinity of the site, as presented in **Figure 8-1**. There are c. 7 residences within a 500m radius and c. 29 within a 1km radius. Most residences comprise isolated farm dwellings and of owner-occupied bungalow/residences. There are no large residential settlements close to the site.

## Sources of Information

### Desktop Studies

- 8.40 A desktop study was carried out to examine all relevant information relating to air quality conditions around the application site. Met Eireann, the National Meteorological Service, was consulted in relation to the climate / weather data in respect of the study area ([Mullingar synoptic weather station 2002–2022 averages \(met.ie\)](http://www.met.ie)). The EPA website was examined to note information on baseline air monitoring data around the application site (<http://www.epa.ie/air/quality/data/>).
- 8.41 Information published on its website by the National Parks and Wildlife Service (NPWS) (<http://webgis.npws.ie/npwsviewer/>), (part of the Department of the Environment, Community and Local Government, DoECLG), in respect of designated ecological sites, protected habitats and species was also reviewed, together with Ordnance Survey maps and aerial photography (<http://map.geohive.ie/mapviewer.html>).

### Baseline Dust Monitoring

- 8.42 In accordance with Condition 7a of the existing permission<sup>3</sup>, monitoring of fugitive dust emissions is undertaken on site as part of the wider operations. The monitoring program submitted and approved to the planning authority commenced in March 2017.
- 8.43 Dust monitoring is undertaken between the months of March to September, inclusive. The dust monitoring locations are shown in **Drawing 8-1**, referenced as D1 to D8. Monitors D6, D7 and D8 are located within 500m of the existing planning permission, whilst D7 and D8 are also within c. 500m of the application site. Monitor D8 is located at the greatest distance (c. 500m) from operations within the extent of the wider BD Flood Landholding and therefore considered to be most representative of background dust deposition levels.
- 8.44 The monitoring method utilised is the 'Bergerhoff method' referred to in the 'TA Luft Air Quality Standard'. The 'Bergerhoff' dust deposition gauge used in the survey comprises a plastic collection bottle with protective basket, mounted on a post and set at 1500 mm above ground level. The deposition of airborne particulate material into the collection bottle takes place over a pre-determined measurement period (usually one month) by exposing it to the

<sup>3</sup> Planning Reference: KA/141129 (ABP PL17.245257).

environment. The total dust collected in the bottle is expressed as deposition of total particulate matter ( $\text{mg}/\text{m}^2/\text{day}$ ) arising from activities in the area surrounding the monitor. The dust deposition at each gauge is then compared against the agreed threshold value of  $350 \text{ mg}/\text{m}^2/\text{day}$ , in line with the approved monitoring strategy.

## Background Air Quality

### Local Air Quality Monitoring

- 8.45 A desktop study has been carried out to examine all relevant information relating to air quality conditions around the application site.
- 8.46 The application site and surrounding area fall into Air Quality Zone D, categorised as rural Ireland by the EPA.
- 8.47 The EPA website was examined to note information on baseline air monitoring data around the application site. The EPA co-ordinates and manages a nationwide network of over 110 monitoring stations which measures the levels of air pollutants and delivers this information to the public as part of the National Ambient Air Quality Monitoring Programme (AAMP). This involved a greatly expanded national monitoring network, providing enhanced real-time information to the public, as well as an increased local authority capacity to conduct indicative air monitoring. The results of the monitoring are compared to limit values set out in EU and national legislation on ambient air quality.
- 8.48 The closest national AAMP monitoring location to the application site which monitors  $\text{PM}_{10}$  and  $\text{PM}_{2.5}$  is 'Cavan' on Farnham Street c. 33 km to the north within Zone D.
- 8.49 The closest national AAMP monitoring location to the application site that monitors for  $\text{NO}_2$  is Edenderry and Kilcitt, c. 41km and 45km south south-east and north north-east, respectively. Both are located within Zone D.
- 8.50 Recent annual mean concentrations monitored at Cavan, Edenderry and Kilcitt (published on the EPA website<sup>4</sup>) are presented in **Table 8-3**, **Table 8-4** and **Table 8-5**.

<sup>4</sup> <https://www.epa.ie/environment-and-you/air/0> [Accessed May 2025]

**Table 8-3: Monitoring data at Cavan (2023)**

Monitoring Station	Annual Mean PM <sub>10</sub> Concentration (µg/m <sup>3</sup> )	Number of Days PM <sub>10</sub> >50µg/m <sup>3</sup>	Annual Mean PM <sub>2.5</sub> Concentration (µg/m <sup>3</sup> )
Cavan	10.0	0	6.4

**Table 8-4: Monitoring data at Edenderry (2023)**

Monitoring Station	Annual Mean NO <sub>2</sub> Concentration (µg/m <sup>3</sup> )	Number of Hours NO <sub>2</sub> >200µg/m <sup>3</sup>	Annual Mean NO <sub>x</sub> Concentration (µg/m <sup>3</sup> )
Edenderry	8.6	0	13.5

**Table 8-5: Monitoring data at Kilkitt (2023)**

Monitoring Station	Annual Mean NO <sub>2</sub> Concentration (µg/m <sup>3</sup> )	Number of Hours NO <sub>2</sub> >200µg/m <sup>3</sup>	Annual Mean NO <sub>x</sub> Concentration (µg/m <sup>3</sup> )
Kilkitt	1.7	0	2.5

8.51 The tables above indicate that NO<sub>2</sub> and PM<sub>10</sub> concentrations monitored are below the annual mean AQALs and there are no exceedances of the 1-hour NO<sub>2</sub> or the 24-hour PM<sub>10</sub> limits. For rural areas, such as those surrounding the application site, it is anticipated that background concentrations would be no greater than the measured data presented.

### Local Mapped Background Concentrations

8.52 Regional-to-local (street) scale air pollutant concentration modelling for Ireland has been undertaken for 2018 and 2019. These models have been subsequently updated and now provide annual high-resolution maps for air quality in Ireland. Datasets from the latest EPA report<sup>5</sup> have been sourced and presented in **Table 8-6**.

**Table 8-6: EPA Background Modelled Data (2023)**

Pollutant	Mapped Background Concentration within Study Area (µg/m <sup>3</sup> )
NO <sub>2</sub>	<5
PM <sub>10</sub>	10-12
PM <sub>2.5</sub>	6-8

### Dust Deposition Monitoring

8.53 The results of the dust deposition monitoring undertaken at the 8 no. locations around the existing site boundary during the 2022 to 2024 are presented in Error! Reference source not found..

**Table 8-7: Dust Deposition Monitoring Results (mg/m<sup>2</sup>/day)**

	D1	D2	D3	D4	D5	D6	D7	D8
<b>2022</b>								
Apr	56	29	9	24	6	1	25	33

<sup>5</sup> Environmental Protection Agency (2024) Air Quality in Ireland Report 2023

	D1	D2	D3	D4	D5	D6	D7	D8
May	90	107	95	88	114	237	106	345
Jun	44	131	75	91	68	59	37	<b>683 (92)</b>
Jul	126	<b>388 (61)</b>	130	251	189	179	69	121
Aug	151	212	265	<b>528 (119)</b>	<b>585 (97)</b>	212	105	138
Sep	141	119	96	376	75	253	197	75
<b>2023</b>								
May	231	191	88	64	73	97	348	75
Jun	32	17	11	120	59	5	53	102
Jul	286	116	41	144	73	99	<b>516 (2)</b>	232
Aug	271	229	193	<b>661 (282)</b>	118	165	92	80
Sep	35	141	101	86	75	132	72	51
<b>2024</b>								
Jul	69	267	202	<b>373 (75)</b>	207	129	47	137
Aug	134	<b>391 (78)</b>	114	104	134	86	104	110
Sep	14	62	347	30	63	33	22	76
Oct	111	114	158	164	113	109	123	106
Table Notes:								
a) Where numbers are provided in brackets, this depicts the 'inorganic' fraction, as a result of further analysis undertaken on the collected sample.								

- 8.54 Monitoring locations D6, D7 and D8 located within 500m of the extant planning permission<sup>3</sup> for sand and gravel extraction had 2 single exceedances during the 2022 to 2024 monitoring period. Further analysis of both occurrences determined the inorganic fraction to be significantly below the limit of 350 mg/m<sup>2</sup>/day.
- 8.55 Dust deposition attributable to the extant operations is considered to be well within the limits set out in the approved monitoring strategy; dust control measures in place for the existing sand and gravel operations are therefore deemed to be satisfactory.
- 8.56 There have been no complaints received by the Site operators with regard to dust deposition in the local area; demonstrating that dust deposition beyond the site boundary at locations of exposure are considered to be acceptable.

### Meteorology: Dispersion of Emissions

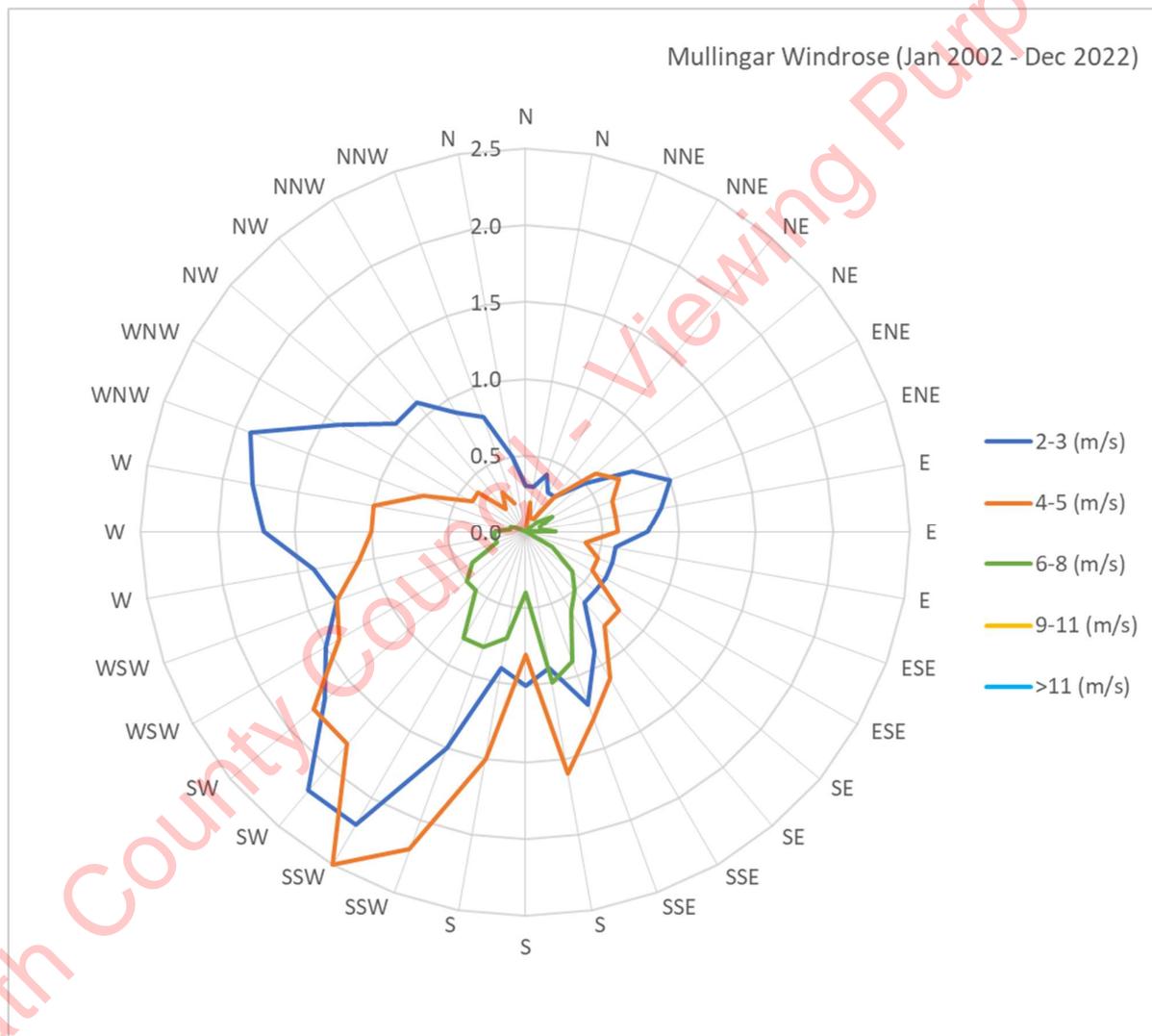
- 8.57 The most important climatological parameters governing the atmospheric dispersion of particles are as follows:
- **wind direction** determines the broad transport of the emission and the sector of the compass into which the emission is dispersed; and
  - **wind speed** will affect ground level emissions by increasing the initial dilution of particles in the emission. It will also affect the potential for dust entrainment.

8.58 Rainfall is also an important climatological parameter in the generation of dust; enough rainfall can suppress dust at the source and eliminate the pathway to the receptor. According to Arup (1995)<sup>6</sup>, rainfall greater than 0.2 mm per day is sufficient to suppress dust emissions.

**Local Wind Speed and Direction Data**

8.59 The nearest meteorological station to the site which records wind speed and direction is the Mullingar Meteorological Station (c. 22km south). In reference to the proximity to the site and similarity of surrounding land uses, the Mullingar recording station is considered representative of typical conditions experienced at the application site. A windrose for the average conditions recorded at Mullingar over a 20-year period (2002-2022) is presented in **Plate 8-1**. The predominant wind direction is from the south-western quadrant.

**Plate 8-1: Windrose for Mullingar Meteorology Station**



<sup>6</sup> Arup Environmental, Ove Arup and Partners (1995) The Environmental Effects of Dust from Surface Mineral Workings, HMSO, London (ISBN 11 75 3186 3)

## Rainfall Data

8.60 Relevant rainfall data applicable to the site has been obtained from the Irish Meteorological Service website for the Mullingar station (2002 – 2022)<sup>7</sup>. The annual average days with rainfall greater than 0.2 mm are 215 days per year. Natural dust suppression (from rainfall) is therefore considered to be effective for 59% of the year.

## Sensitive Receptors

### Ecological Receptors

- 8.61 Mapping data published by the National Parks and Wildlife Service (NPWS) and the Air Pollution Information System (APIS) has been utilised to identify designated ecological sites and protected habitats within the Site locale.
- 8.62 The application site is not subject to any statutory or non-statutory nature conservation designations. The closest conservation site is the proposed Natural Heritage Area (pNHA - Site Code 001814), part of which is located within the wider quarry landholding, located c. 400m west of the application site.
- 8.63 The closest Natura site is the White Lough, Ben Loughs and Lough Doo SAC (Site Code 001810) circa 700m southwest of the application site.

### Human Receptors

8.64 Sensitive locations are those where people may be exposed to emissions to air from the proposed development. Receptors have been identified within a 1 km distance of the application site boundary at Murrens townlands, as illustrated in **Figure 8-1**.

## Impact Assessment Methodology

8.65 The assessment approach has been informed by both national and local planning policy and guidance and established best practice and experience. The methodology used is presented in the sub-sections below.

### Road Traffic Emissions Assessment

- 8.66 Atmospheric emissions related to site proposals are primarily associated with the exhaust emissions from heavy duty vehicles (HDVs also termed heavy goods vehicles HGV's).
- 8.67 The assessment of air quality effects in relation to traffic generated during operational phase of the proposed development has been screened in accordance with Transport Infrastructure Ireland (TII) guidance<sup>12</sup> and the DMRB<sup>13</sup> guidance to identify whether further assessment is required.
- 8.68 The following traffic screening criteria used to determine whether the air quality impacts of a project can be scoped out or require a detailed assessment is based on the changes between the do something traffic (with the project) compared to the do minimum traffic (without the project) in the opening year.
- 8.69 Relevant screening applicable to the affected local road network is:
- Annual average daily traffic (AADT) flows will change by 1,000 or more; or
  - Heavy duty vehicle (HDV) flows will change by 200 AADT or more; or

<sup>7</sup> Historical Data - Met Éireann - The Irish Meteorological Service

- a change in speed band; or
  - a change in carriageway alignment by  $\geq 5$  m.
- 8.70 If the traffic is not found to exceed any of the screening criteria presented, then effects are considered to be *not significant* and can be screened out of further consideration:
- 8.71 If the screening criteria is exceeded, human and ecological receptors within 200 m of affected roads would be assessed, where necessary. If an ecological and/ or human receptor is located  $>200$  m from an affected road link, further consideration is not required.
- 8.72 The 200 m distance screening threshold is supported in various guidance documents including the TII guidance and is therefore considered appropriate.

### Dust Impact Assessment

- 8.73 The assessment has been undertaken in accordance with the IAQM's *Guidance on the Assessment of Mineral Dust Impacts for Planning* document. The methodology is summarised below and available to download on the IAQM website<sup>8</sup> and therefore not reproduced in full here.
- 8.74 This guidance uses a simple qualitative distance-based screening process to identify those operations where the dust impacts are unlikely to be significant and therefore require no further assessment. Where more detailed assessment is required, a basic assessment framework is presented which employs the Source-Pathway-Receptor approach to evaluate risk of impacts and effects.
- 8.75 The IAQM guidance uses a distance-based screening criteria for both suspended dust (PM<sub>10</sub>) and deposited dust, stating that adverse impacts from soft rock sites (i.e. sand and gravel) are uncommon beyond 250m and 1km for deposited dust and suspended dust respectively<sup>9</sup> (measured from the nearest dust generating activity).

### Deposited Dust

- 8.76 Where there are sensitive receptors within the screening distance of 250m, the assessment would progress onto a risk-based approach based on the source-pathway-receptor conceptual model, i.e. the hypothetical relationship between the source (S) of the pollutant, the pathway (P) by which exposure might occur, and the receptor (R) that could be adversely affected.
- 8.77 The key steps are:
- **assess the application site characteristics and baseline conditions:** Incorporates a review of baseline conditions including PM<sub>10</sub> background; a description of activities to inform the source term; and characterisation of the application site setting in terms of the location and sensitivity of representative receptors, and meteorological conditions (wind patterns and rainfall);
  - **estimate dust impact risk:** the dust impact risk for each representative receptor is determined from the source term (residual dust risk after embedded mitigation) and pathway. The 'pathway effectiveness' is based upon the distance of the receptor from the dust source and the frequency at which it is down-wind from the source (factoring out the frequency of wet days). The assessment of impact considers emissions from the application site as a whole; and

<sup>8</sup> <https://iaqm.co.uk/guidance/>

<sup>9</sup> Measured from the nearest dust generating activity.

- **estimate likely magnitude of effect:** The risk predicted at each representative receptor is considered together with the sensitivity of that receptor, to give the likely magnitude of the effect that will be experienced.
- 8.78 The IAQM minerals dust assessment methodology provides a framework to establish the unmitigated risk of dust impacts associated with a development at both human and ecological receptors, whilst taking into account existing and designed-in control measures.
- 8.79 The IAQM assessment methodology predicts the likely magnitude of effect using a number of factors, including the receptor sensitivity and the risk of impact. The risk of impact is determined using the residual source magnitude of a dust generating activity and the pathway effectiveness. The determination of the magnitude of effect is presented below in **Table 8-8**.

**Table 8-8: IAQM Determination of Magnitude of Effect**

Risk of Impact	Receptor Sensitivity		
	Low	Medium	High
High Risk	Slight Adverse Effect	Moderate Adverse Effect	Substantial Adverse Effect
Medium Risk	Negligible	Slight Adverse Effect	Moderate Adverse Effect
Low Risk	Negligible	Negligible	Slight Adverse Effect
Negligible Risk	Negligible	Negligible	Negligible

- 8.80 Following determination of the separate degree of estimated effects for disamenity, ecological and health effects, a conclusion on the likely significance of air quality effects is reached.
- 8.81 The assessment takes into account controls that are incorporated into the scheme design. If the outcome of the assessment is that the air quality effect is not significant, then it is likely that these controls would be sufficient. If, on the other hand, the assessment predicts the impacts and effects to be significant, then it is likely that additional mitigation will be required, to a proportionate degree to sufficiently reduce the impacts.
- 8.82 Following the results of the risk assessment, additional mitigation measures are detailed, as required, and the residual impact assessed.

**Suspended Dust (PM<sub>10</sub>)**

- 8.83 In accordance with the IAQM distance-based screening methodology, if there are sensitive receptors within 1km of the application site then further assessment of potential impacts for suspended dust are required.
- 8.84 The IAQM guidance notes that “Dust arising...can reduce amenity in the local community due to visible dust plumes and dust soiling. The generally coarser dust that leads to these effects may, therefore, be referred to as ‘disamenity dust’. The smaller dust particles can remain airborne longer, potentially increasing local ambient concentrations of suspended particulate matter (e.g. PM<sub>10</sub> and to a lesser extent PM<sub>2.5</sub>), which is associated with a range of health effects”.
- 8.85 The guidance further notes “...the PM<sub>10</sub> fraction is relevant to health outcomes. For quarries most of this suspended dust will be in the coarse sub-fraction (PM<sub>2.5-10</sub>), rather than in the fine (PM<sub>2.5</sub>) fraction.” It is on this basis that only PM<sub>10</sub> is considered further in this assessment.
- 8.86 With respect to PM<sub>10</sub> and in accordance with the IAQM minerals guidance, if backgrounds are less than 17µg/m<sup>3</sup>, it is considered there is little risk of the impacts from the proposed development to cause an exceedance of the annual mean AQAL. Where backgrounds are

greater than  $17\mu\text{g}/\text{m}^3$ , the impact should be considered together with baseline conditions to assess the potential significance of effects on the surrounding receptors.

## Assessment of Impacts - Dust

### Current & Permitted Site Operations

- 8.87 Quarry operations at the Murrens have been in operations since 1962. Extraction operations are currently being undertaken to the immediate north and north-west of the application site under the extant permission<sup>3</sup> (which has a total extraction area of 23.9ha and is due to expire in December 2036. There is a portion of the existing permitted development located to the southwest area of the site (referred to as 'Area 1' and illustrated in **Figure 8-2**) which will no longer be extracted due to poor quality of the materials.
- 8.88 The western area of the overall landholding area is exhausted of resources and partly restored. The central area contains the site facilities and processing area, including the existing crushing and screening and washing plant, a concrete batching plant, concrete block plant and block yard, along with ancillary infrastructure.
- 8.89 Stripping of soils and overburden along with the extraction of sand and gravel and subsequent replacement of soils and overburden as part of the restoration plan are undertaken in a progressive manner, with the extraction face advancing southeast from the existing pit, in the direction of the application site.
- 8.90 Soils and overburden are stored on site either in landscaped screening berms or stored for final restoration of the extraction area.
- 8.91 Sand and gravels are excavated using a mechanical excavator which transfers the material to a mobile crusher adjacent to the working face to crush any oversized boulders. Extracted and crushed material are then transferred by conveyor to the existing crushing, screening and washing plant within the wider landholding<sup>10</sup>, located c. 1.5km from the Proposed Development.
- 8.92 The existing sand and gravel extraction pit is permitted<sup>3</sup> to export up to 500,000 tonnes of material from the site annually. This equates to approximately 95 HGV loads per day; further information on the traffic movements is available within **Chapter 14: Traffic**.

### Proposed Site Operations

- 8.93 The proposed development is for the extraction of sand and gravel from an area of c. 4.2 ha within the application site; this is effectively a replacement source of sand and gravel materials from a c. 4 ha area within the existing site that shall not be extracted due to poor material quality ('Area 1', see **Figure 8-2**). The site has an estimated reserve of 875,000 tonnes sand and gravel with 25,000 tonnes of soil and overburden requiring (progressive) removal.
- 8.94 There will be no significant changes to the operational arrangements of the existing extraction activities. The extraction methods, extraction rates, hours of working and transfer of material to the existing processing plant via field conveyor would remain the same.
- 8.95 The material would be worked concurrently over the remaining time period permitted by the extant planning permission<sup>3</sup>. The fixed field conveyor would be extended in a southerly direction to ensure extracted material continues to be transferred to the processing plant by conveyor.

<sup>10</sup> Planning Ref No. 78-547 / S261 Ref. QY24 / ABP PL17.SU0079

- 8.96 There would be no changes to traffic movements generated offsite as a result of the Proposed Development.

### Screening Assessment

- 8.97 In accordance with the adopted IAQM screening criteria, further assessment of deposited dust and suspended dust is required at dust sensitive receptors within 250m and 1km, respectively.
- 8.98 As illustrated in **Figure 8-2**, there are human receptors with a sensitivity to dust emissions within 250m of the application site. There are no designated habitat sites within 250m of the site.
- 8.99 Further assessment for the potential impact of deposited and suspended dust on human receptors has therefore been undertaken.

### Deposited Dust Assessment

- 8.100 One single human receptor location (R1) has been identified within the screening distance for consideration in the assessment of dust deposition. Receptor R1 is located c. 235m south southwest from the application site boundary, as illustrated in **Drawing 8-1**. Receptor R1 is a residential dwelling, therefore it has been classified as being of high sensitivity to dust deposition.
- 8.101 The potential dust sources within 250m of the identified receptor and their potential for emission are considered below. From these, the determined residual source emissions are stated per activity or area, which in turn are based on general knowledge of the processes. The activities with the potential to generate dust and are therefore considered within the assessment below are as follows:
- Site preparation & restoration;
  - Internal haulage;
  - Mineral extraction; and
  - Material handling.

### Residual Source Emission (RSE) Magnitude

- 8.102 The residual source emissions (RSE) magnitude is the potential magnitude of dust emissions after embedded mitigation measures have been taken into account. This dust assessment identifies whether dust controls above the current baseline level of control is required to ensure the proposed development has an insignificant impact on local air quality.

### Embedded Mitigation Measures

- 8.103 On the basis that the proposed development is essentially a lateral continuation of the existing operations (as a replacement to the extraction of materials in 'Area 1'), the embedded mitigation measures are considered to include any operational measures implemented within the current permitted extraction area as well as any designed in measures for the application site.
- 8.104 Operational measures that would continue to be implemented throughout the duration of the proposed development include the following:
- Dust monitoring at 8 No. locations across the wider landholding;
  - Use of the field conveyor for transfer of material to the central processing site;
  - Tractor and bowser on site for haulage routes; and

- Wheel wash and paved site access route.
- 8.105 Designed-in measures that have been incorporated into the design of the proposed development that impact upon dust generation and control include the following:
- Low energy extraction methods;
  - Progressive soil stripping and overburden and subsequent restoration to minimise working areas and areas of exposed surfaces;
  - Storage of soils and overburden in screening berms as an additional dust screen;
  - Vegetation of screening berms;
  - Internal haulage routes, stockpiles and mobile crushing unit located greater than 250m from offsite receptors; and
  - Buffer distance of c.250m between extraction operations and off-site receptors, benefitting from additional screening in the form of mature forest between the application site and the R195 Regional Road.

**Summary of Residual Source Emission (RSE) Magnitude**

8.106 The residual source emissions (RSE) magnitude (i.e. the potential magnitude of dust emission after embedded mitigation measures have been taken into account) for each required activity is presented in **Table 8-9**.

**Table 8-9: Summary of Residual Source Emission (RSE) Magnitudes**

Activity	RSE	Factors / Designed in Measures (for activities <250m of receptors)
Site preparation / restoration	Small	<ul style="list-style-type: none"> <li>• Small, discrete working areas with progressive stripping / restoration</li> <li>• Construction of screening berms using stripped soils / overburden</li> <li>• Screening berms vegetated as soon as practicable</li> <li>• 25,000t of soil / overburden across the application site (phased across the operational period)</li> <li>• Extension of fixed field conveyor – low dust potential, short term</li> <li>• Tractor and bowser for use during dry / windy weather conditions</li> </ul>
Internal haulage	Small	<ul style="list-style-type: none"> <li>• Haulage requirements limited to transfer of excavated mineral to mobile crusher / conveyor hopper, and transfer of soils / overburden within site.</li> <li>• Low no. plant required (2 No. tracked excavators for mineral transfer and 1 No. dump truck for occasional transfer of soils / overburden)</li> <li>• All mineral transferred to processing plant via conveyor (beyond application site)</li> <li>• Tractor and bowser for use during dry / windy weather conditions</li> <li>• Unconsolidated surface</li> </ul>
Excavation	Medium	<ul style="list-style-type: none"> <li>• Low energy extraction methods – mechanical excavator</li> <li>• Small working areas (&lt;20ha)</li> <li>• Excavated material of moderate to high dust potential</li> </ul>

		<ul style="list-style-type: none"> <li>Tractor and bowser for use during dry / windy weather conditions</li> <li>Maximum extraction rate of 500,000 tpa.</li> </ul>
Material handling	Medium	<ul style="list-style-type: none"> <li>Low no. heavy plant in daily operation (2 x tracked excavators, 2 x loading shovels)</li> <li>1 x dump truck for occasional soil / overburden transfer</li> <li>Unconsolidated surface</li> <li>Material of moderate to high dust potential</li> <li>Tractor and bowser for use during dry / windy weather conditions</li> </ul>

8.107 As a precautionary approach the highest activity classification, i.e. 'medium', has been applied in the risk assessment matrix.

**Summary of Pathway Effectiveness**

8.108 The site-specific factors considered to determine the effectiveness of the pathway are the distance and direction of receptors relative to the prevailing wind directions. The frequency of winds with the potential to carry dust from the operational areas to the respective receptors were calculated on the basis of the orientation and the meteorological conditions as detailed in **Plate 8-1**.

8.109 A summary of the pathway effectiveness, in accordance with the IAQM methodology is provided in **Table 8-10**.

**Table 8-10: Determination of Pathway Effectiveness**

Receptor	Distance from Operations (m)	IAQM Distance Category	Wind Sectors Affecting Receptor	Frequency of Winds (>5m/s and Dry)	Frequency Category	Pathway Effectiveness
R1	250m	Distant	NW - N	<5%	Infrequent	Ineffective

**Summary of Dust Effects and Significance**

8.110 The likely magnitude of dust effects has been determined by consideration of the residual source emission and the pathway effectiveness, in accordance with the IAQM methodology. The results are summarised in **Table 8-11**.

**Table 8-11: Summary of Dust Impact Risk and Magnitude of Effects**

Receptor	Residual Source Emission	Pathway Effectiveness	Dust Impact Risk	Receptor Sensitivity	Magnitude of Dust Effects
R1	Medium	Ineffective	Negligible	High	Negligible

8.111 The likely dust effect is predicted to be 'negligible' at all receptors located within the relevant IAQM screening distance.

8.112 Based upon the consideration of the magnitude of effects at the individual receptors, the overall effect from dust emissions on disamenity is considered be 'not significant' for the proposed development with the embedded mitigation measures taken into account.

## Suspended Dust Assessment

- 8.113 As previously stated, the IAQM minerals guidance states that if the annual mean PM<sub>10</sub> background concentration is less than 17µg/m<sup>3</sup> it is considered unlikely that any process contribution from the additional activities proposed at the site would lead to an exceedance of the annual mean AQAL.
- 8.114 The existing air quality, in terms of annual PM<sub>10</sub>, has been taken from the background maps to represent conditions at the site. The maximum background PM<sub>10</sub> concentration across the surrounding environment is 10-12 µg/m<sup>3</sup>, representing approximately 25% of the corresponding AQAL for PM<sub>10</sub> and well below the criteria of 17µg/m<sup>3</sup>.
- 8.115 It is therefore considered that in the absence of additional mitigation above the embedded measures stipulated in **paragraphs 8.103 to 8.105**, the effect of the continuation of existing operations on human health as a result of emissions of suspended dust would be negligible.

## Assessment of Impacts – Traffic Emissions

- 8.116 The site is currently permitted<sup>3</sup> to export up to 500,000 tonnes of material from the site annually.
- 8.117 It is proposed to switch an area of extraction granted under the extant planning permission, due to the poor quality of the materials, to the alternative proposed extension extraction area (the application site) adjacent to the existing sand and gravel pit development. The proposed area will effectively be a replacement source of sand and gravel materials with extraction to be commensurate with the life of the extant permission<sup>3</sup>.
- 8.118 In consideration that the proposed extraction rates will not increase on existing permitted and operational rates, the proposed development would not result in an increase in traffic volumes from the site.
- 8.119 As the proposed development would not result in an increase in traffic volumes from the site, impacts on human and ecological receptors are considered to be 'not significant'. Therefore, no further assessment is required and the associated effect of road traffic is not significant.

## Mitigation and Management

### Unplanned Events (i.e., Accidents)

- 8.120 Accidents, malfunctions, and unplanned events refer to events or upset conditions that are not part of any activity or normal operation of the proposed development planned by the Applicant. Even with the best planning and the implementation of preventative measures, the potential exists for accidents, malfunctions, or unplanned events to occur during the proposed development operations.
- 8.121 Many accidents, malfunctions and unplanned events are, however, preventable and can be readily addressed or prevented by good planning, design, emergency response planning, and mitigation. In terms of air quality impact, the following unplanned events could influence the local area:
- equipment malfunction;
  - dry and windy weather conditions with dust suppression equipment malfunction; and
  - accidental material spillages during transport.

- 8.122 In relation to air quality, the impacts of any unplanned events are considered to be negligible. If unplanned events were not mitigated, the effects of dust during dry and windy conditions could possibly lead to occasional increases in nuisance dust and 24-hour mean PM<sub>10</sub> concentration immediately surrounding the application site.
- 8.123 In the event that the water suppression is not operational for a short period of time (i.e. malfunction or maintenance) and meteorological conditions dictate that water suppression is required to ensure dust emissions do not disperse to off-site receptors, alternative sources of water would be investigated.

### Cumulative / Synergistic Impacts

- 8.124 Cumulative impacts are those which result from incremental changes caused by other past, present, or reasonably foreseeable actions or developments together with those generated by 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.
- 8.125 This air quality impact assessment herein indicates that the proposed development will not contribute to a significant increase in local air pollution by way of excessive air / dust emissions.
- 8.126 The other sources of air emissions within 1km of the application site are limited to those that are long term operations, including those within the landholders boundary (i.e. central processing plant and current extraction site) and outside (i.e. JJ Flood operations to the northeast).
- 8.127 There are no significant sources of air emissions aside from the proposed development within the IAQM 250m screening criteria of the assessed receptor (Ref R1) that need to be taken account of within the assessment.
- 8.128 The cumulative impact of the proposed development is therefore classified as insignificant.

### Interaction with Other Impacts

- 8.129 The potential impact on air quality by the project on sensitive receptors including sensitive ecological and human receptors has been fully assessed in this chapter.

### Mitigation Measures

- 8.130 The overall effects from the proposed development are considered to be 'not significant' with the embedded mitigation measures taken into account. Notwithstanding this, a series of industry good practise operational controls have been recommended for (continued) implementation during the proposed development.
- 8.131 **Table 8-12** presents a summary of both designed in measures and operational measures that together, summarise the current operational controls that would be adhered to on a routine basis within both the application site and the wider landholding area. The implementation of such measures would ensure potential dust impacts remain 'not significant'.
- 8.132 **Table 8-13** then presents a series of additional measures that are recommended for inclusion for the proposed development based on industry good practice. This is followed up with recommendations with regard to monitoring of airborne emissions.

**Table 8-12: Summary of Designed in Mitigation Measures**

Activity	Designed in Mitigation Measures
<b>Within Application Site:</b>	
Site preparation / restoration	Progressive soil stripping / overburden removal and restoration Application of water suppression using onsite bowser, as required
Excavation	Majority of excavation undertaken below the natural lay of the land, acting as a natural barrier
Material handling	Application of water suppression using onsite bowser, as required A water bowser is present full-time at the site for dust control. If for any reason the on-site water bowser is out of action, BD Flood employ a contractor to carry out dust suppression
On-site transportation	Application of water suppression using onsite bowser, as required Site speed limit of 15kph
Processing	Mobile Crushing Plant: Fitted with a dust suppression system, to be used at all times when in operation. Application of water suppression using onsite bowser, as required
Storage – soil / overburden	Seed / vegetate surfaces of stockpiles of overburden / soils.
<b>Within Wider Landholding</b>	
Off-site transportation	Wheel wash facility, to be used by all vehicles exiting the wider site onto public road Paved access road of 220m Site speed limit of 15kph on access road (signage and staff training) Mechanical road sweeper for use on paved access road and local public road network Sheeting of all loaded vehicles prior to leaving site
On-site transportation	Application of water suppression using onsite bowser, as required Site speed limit of 15kph All materials transferred to processing plant by conveyor

**Table 8-13: Summary of Recommended Mitigation Measures**

Activity	Recommended Mitigation Measures
Site preparation / restoration	Restricted vehicular access to restored areas Handling minimised where possible and drop heights reduced to the minimum practicable.
Material handling	Minimise drop heights when handling material. Protect from wind where possible.
On-site transportation	All onsite haulage routes regularly inspected for integrity with repairs instigated as soon as practicable (all inspections / actions recorded in site log book)
Processing	All plant used within its design capacity and serviced in line with manufacturers recommendations (all to be recorded within site log book)

## Monitoring

- 8.133 Dust deposition monitoring should continue to be undertaken at the site for the duration of the proposed development (in accordance with conditions attached to any future planning permission and in line with the EPA and DoEHLG guidelines).
- 8.134 Whilst the absence in complaints demonstrates the effectiveness of mitigation as part of the extant permission, the proposed extension does bring extraction activities in closer proximity to the residential areas to the south, along the R195 Regional Road.
- 8.135 Dust monitoring should continue using the Bergerhoff Method at the existing monitoring locations D1 to D8. It is recommended that an additional dust monitor (D9) is installed along the southern boundary of the wider landholding (i.e. between the southern extent of the proposed development and the residential areas along the R195), to ensure levels of dust deposition in at the residences south of the proposed development are monitored.

## Residual Impact Assessment

- 8.136 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 air quality and dust related impacts at receptors generated by the proposed development will be 'negligible'

## Conclusion

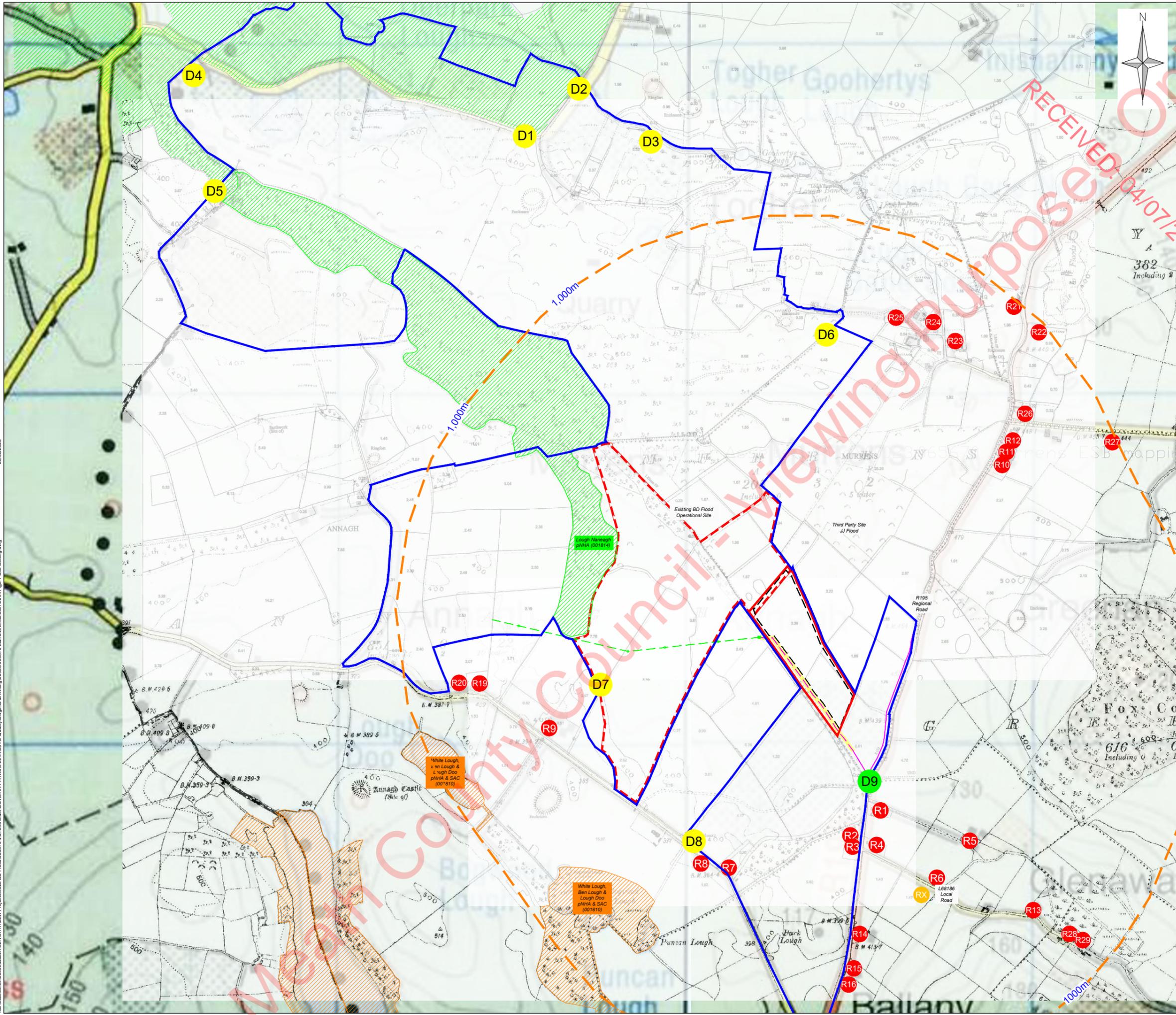
- 8.137 This assessment has considered the potential air quality effects arising from the proposed extension extraction area of c 4.2 hectares adjacent to the existing sand and gravel pit development<sup>3</sup> at Baltrasna, Murrens and Annagh townlands, Oldcastle, Co. Meath.
- 8.138 A qualitative assessment of potential dust effects associated with the proposed development has been undertaken in accordance with the IAQM 'Guidance on the Assessment of Mineral Dust Impacts for Planning'.
- 8.139 Following the continued implementation of operational dust control measures on site and the designed in environmental measures, impacts on disamenity, human and ecological receptors are considered to be 'not significant'. Notwithstanding this, a series of industry good practice measures have been recommended, alongside additional monitoring to supplement the existing monitoring regime.
- 8.140 A screening assessment of vehicle has been undertaken. On account of the extraction rates not proposed to increase above the permitted and operational rates, traffic volumes generated offsite will not increase as a result of the proposed development. As such, impacts on human and ecological receptors are considered to be 'not significant'.
- 8.141 Overall, it is therefore considered that the potential impacts from dust and airborne emissions arising from the proposed development do not present a material constraint to the development proposals.

## Figures

Figure 8-1 Site Setting & Dust Monitor Locations

Figure 8-2 Site Layout & Receptor Locations

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**Notes:**

1. Based on Tailte Eireann Digital maps 2304, 2305, 2367, 2368; 6 inch raster scale maps MH014, MH015, WH004; and 50,000 scale Discovery series maps 41 & 42

- Legend:**
- Landholding
  - Planning Application Area (c. 5.8 hectares)
  - Proposed Extraction Area (c. 4.2 hectares)
  - Planning Permission KA14/1129 (c. 28.5 hectares)
  - Distance Off-Sets from Planning Application Boundary 1km
  - R2 Residential Property Locations  
*Residences within 1km of Red Line Application Boundary*
  - RX Residential Property permitted within the last 5 years but not yet constructed
  - D1 Existing Dust Monitoring Locations
  - D9 Proposed New Dust Monitoring Location

Rev	Amendments	Date	By	Chk	Auth



Client  
BD Flood Unlimited Company

Project  
Sand & Gravel Pit Extension  
The Murrins, Oldcastle, Co. Meath

Figure Title  
Site Setting & Dust Monitor Locations

Scale NTS @ A3	SLR Project No. 501.065670.00001		
Designed smcd	Drawn scmd	Checked lh	Authorised lh
Date 01/25	Date 01/25	Date 03/25	Date 03/25

Figure Number  
**Figure 8-1**

