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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 on air quality of the proposed development at Kilmore, Brinny, Co. Cork.

8.2 The proposed development will consist of:

- An extension to the existing sand & gravel pit with extraction area of c. 9.8 hectares worked on a phased basis.
- Continued use of development granted planning permission under P. Ref. 24/6269 comprising the existing processing plant and related water management system; the existing concrete plant; ancillary buildings (site office (63 sq.m), 3 no. welfare portacabins (32 sq.m, 23.5 sq.m & 22.0 sqm), 4 no. storage buildings / containers (15 sq.m, 10 sq.m, 6 sq.m & 5 sq.m), 2 no. garages (76 sqm & 76 sq.m), ESB Substation (26 sq.m)); covered vehicle storage (220 sq.m); site access and all related ancillary facilities (wheelwash, fuel storage tank, weighbridge); and recycling of c. 15,000 tonnes of concrete per year for use in concrete production.
- Phased and final restoration to agricultural use.

All within an application area of c. 18.3 hectares.

Permission is sought for fifteen years plus two years for final restoration (total duration 17 years).

8.3 The proposed development will comprise extraction and restoration on a phased basis. Further information on the proposed development, site activities, environmental management systems and controls at the application site are provided in the Chapter 2 of this EIAR.

8.4 The proposed development will have the potential to generate fugitive dust emissions and particulates (PM10), which may result in impacts on local air quality. Combustion emissions (primary PM10, and oxides of nitrogen) from exhaust emissions associated with the sand and gravel extraction and the production and transportation of aggregates may also have the potential to impact on local air pollution.

8.5 Planning permission ref. 24/06269 provides for recycling of 15,000 tonnes of concrete per year for use in concrete production; importation of 25,000 tonnes of sand & gravel for processing; and importation of up to 20,000 tonnes of inert soil & stone per year (under Article 27) for phased restoration. This equates to a total of up to 60,000 tonnes per year.

8.6 The proposed maximum annual output from the pit extension will be 60,000 tonnes of sand & gravel per year.

8.7 The maximum number of HGV movements will be one to two HGV trips per hour based on a maximum annual total output / import of 120,000 tonnes per year, 50 week year, 5.5 day week ,11 hour full day and 28 tonne (aggregates / inert soil) or 8 cu. metre (concrete) HGV loads.

Scope of Work

8.8 The main focus of this assessment is the potential impact on local residential amenity of fugitive dust emissions and particulate matter generated by the proposed development. Dust emissions are likely to arise in the course of the following activities:

- soil stripping, earthworks and topsoil stockpiling (site preparation and restoration works);
- handling and processing of excavated sand and gravel;
- transfer, end-tipping and stockpiling of aggregates;
- trafficking by heavy goods vehicles (HGVs) over paved / unpaved surfaces;
- landscaping and final restoration activities.

8.9 With respect to the potential for air quality impacts, the key objective at the application site is to manage activities in order to ensure that air emissions are prevented where possible, and the effects of any residual releases are minimised.

8.10 This EIAR chapter describes and assesses the existing air quality baseline characteristics of the area at and around Brinny based on site specific surveys and EPA data. Air emissions arising from the proposed activities at the application site are then applied to these baseline conditions and the resulting air quality impacts assessed. Mitigation measures are identified where required, to eliminate and reduce these impacts insofar as practical.

8.11 The following sections of this Chapter describe the potential air quality impacts associated with the planned development activities. The following issues are addressed separately:

- relevant legislation, standards and guidance;
- baseline conditions pertaining to measured (or estimated) existing air quality levels around the existing site;
- methodology used to assess the potential impacts of planned activities on air quality at local properties;
- assessment of the impacts;
- description of mitigation measures that are incorporated into the construction, design and operation of the proposed development to eliminate or reduce the potential for increased air quality impacts (if required);
- summary of any residual impacts and reinstatement;
- summary of cumulative impacts;
- monitoring proposals.

Contributors / Author(s)

8.12 The air quality impact assessment presented in this Chapter was prepared by SLR Consulting Ireland. The lead consultant for the study was Tim Paul MSc CEng MRICS MIEI MIQ.

Limitations / Difficulties Encountered

8.13 This assessment is compiled on the basis of published regional and local data, guidance documents, and site-specific field surveys. No difficulties were encountered in compiling the required information.

Regulatory Background

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

Legislation

Air Quality Standards

8.15 The Government's policy on air quality within Ireland is set out in the Air Quality Standards (AQS) Regulations 2011. The CAFE Directive was transposed into Irish legislation by the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011). It replaces the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), the Ozone in Ambient Air Regulations 2004 (S.I. No. 53 of 2004) and the EPA Act 1992 (Ambient Air Quality Assessment and Management) Regulations 1999 (S.I. No. 33 of 1999). The 4th Daughter Directive was transposed by the Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations 2009 (S.I.no. 58 of 2009).

8.16 The AQS sets out a framework for reducing hazards to health from air pollution and ensuring that international commitments are met in Ireland.

8.17 The AQS 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).

8.18 Under the AQS, the following pollutants are monitored and controlled :

- nitrogen oxides;
- sulphur dioxide;
- carbon monoxide;
- ozone;
- particulate matter (PM10, PM2.5 and black smoke);
- benzene and volatile organic compounds;
- heavy metals; and
- polycyclic aromatic hydrocarbons.

8.19 These pollutants are monitored at stations across the country and together they form the national ambient air quality network. A summary of relevant air quality limit values in relation to human health are presented in Table 8-1. Air quality limit values in relation to vegetation protection are presented separately in Table 8-2.

8.20 The air quality monitoring network is coordinated and managed by the EPA, as the National Reference Laboratory for air quality. The results of the monitoring are compared

to limit values set out in EU and national legislation on ambient air quality. Map-based assessments of air quality are prepared and published by the EPA.

Table 8-1: Relevant Air Quality Limit Values for Protection of Human Health

Human health	Limit or target value			Information and alert thresholds (where applicable)		Long-term objective
Pollutant	**Averaging period**	**Value**	**Maximum number of allowed occurrences**	**Period**	**Threshold value**	
Nitrogen Dioxide (NO_2)	Hour Year	200 µg/m^3 40 µg/m^3	18 0	1 hour alert	400 µg/m^3 Exceeded for 3 consecutive hours	
Sulphur Dioxide (SO_2)	Hour Day	350 µg/m^3 125 µg/m^3	24 3	1 hour alert	500 µg/m^3 Exceeded for 3 consecutive hours	
Particulate matter with aerodynamic diameter of less than 10µm (PM10)	Day Year	50 µg/m^3 40 µg/m^3	35 0			
Particulate matter with aerodynamic diameter of less than 2.5µm (PM2.5)	Year	25 µg/m^3 20 µg/m^3 (ECO)				0 8.5 to 18 µg/m^3

Table 8-2: Summary of Air Quality Limit Values : Protection of Vegetation

Vegetation	Critical level or target value		Long-term objective	
Pollutant	**Averaging period**	**Value**	**Value**	**Date**
Nitrogen dioxide (NOx)	Calendar year	30 µg/m^3		
Sulphur Dioxide (SO2)	Calendar year and winter (October to March)	20 µg/m^3		

Planning Policy and Development Control

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

8.21 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. In the framework, the extractive industries are recognised as important for the

supply of aggregates and construction materials to variety of sectors. It emphases that the planning process will play a key role in realising the potential of the extractive industries and protecting reserves of aggregates and minerals. Aggregates and minerals will continue to be enabled where this is compatible with protection of the environments.

8.22 There are no specific policies in relation to air emissions in NPF for extractive or production of construction aggregates and materials. The general objective is to facilitate development and to protect the environment at the same time.

Guidelines Extractive Industry Emissions Limit Values

8.23 Section 261 of the Planning and Development Act 2000 (as amended), which regulated a significant proportion of established extractive development, came into effect in April 2004. The planning guidelines[1] for the extractive industries '*Quarries and Ancillary Activities – Guidelines for* Planning *Authorities*' were published by the Department of the Environment, Heritage and Local Government at around the same time.

8.24 Separately, in 2006, the EPA published complementary guidance aimed at pit / quarry operators, planning authorities and the general public *Environmental Management Guidelines for Environmental Management in the Extractive Industry (Non-Scheduled Minerals)*[2].

8.25 The Irish Concrete Federation (ICF), the trade body representing the interests of pit / quarry operators and producers of construction materials, has also published the ICF Environmental Code to provide guidance for its members on best practice in the environmental management of quarries. The document was last updated in 2005.

Specific Guidance Relating to Air Quality / Dust Nuisance

8.26 A range of monitoring techniques exist for dust deposition rates (i.e. Bergerhoff and Frisbee gauges). There is 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 annoyance.

8.27 Industry standard criteria levels for the gravimetric assessment of dust deposition from extractive industry in Ireland are 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 TA Luft dust deposition limit value of 350mg/m^2/day (total dust deposition averaged over a 30-day period), measured at site boundaries

8.28 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 and causes a complaint is highly subjective.

8.29 The action of wind over dry ground will carry dust particles into the air. Although large emissions of dust occur naturally, man-made dust events are caused by a range of activities including agriculture, road traffic, construction works (including the handling and

[1] Quarries and Ancillary Activities – Guidelines for Planning Authorities (DoEHLG, 2004)

[2] https://www.epa.ie/pubs/advice/general/EPA_management_extractive_industry.pdf

storage of soils and particulate matter) and by vehicles using paved and unpaved haul roads.

8.30 For operations involving the mechanical break up of solids, the most common concern regarding dust emissions is the potential nuisance effect from the larger fractions of dust.

Guidance on Assessment of Mineral Dust Impacts for Planning

8.31 Guidance on the assessment of the impacts of extractive operations on air quality has been prepared by the Institute of Air Quality Management (IAQM, 2016)[3]. This guidance uses a simple 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.

Air Quality and Ecological Receptors

8.32 A majority of the research on the effects of particulate matter on vegetation has focussed on the chemical effects of alkaline dusts. A summary of a review of available research on behalf of the UK's Department for the Environment Transport and Regions (DETR) concluded that:

"*The issue of dust on ecological receptors is largely confined to the associated chemical effect of dust, and particularly the effect of acidic or alkaline dust influencing vegetation through soils*."

8.33 An Interim Advice Note (IAN) prepared as a supplement for Volume 11, Section 3, Part 1 of the UK DMRB (Design Manual for Roads and Bridges) and now incorporated into LA 105) suggests that only dust deposition levels above 1,000mg/m^2/day are likely to affect sensitive ecological receptors. This level of dust deposition is approximately five times greater than the level at which most dust deposition may start to cause a perceptible nuisance to humans. It states that most species appear to be unaffected until dust deposition rates are at levels considerably higher than this.

Assessment of Air Quality Impacts on Designated Nature Conservation Areas

8.34 Guidance on the assessment of the air quality impacts of development on designated nature conservation sites WAS prepared by the Institute of Air Quality Management (IAQM, 2019). This guidance is also useful to evaluate the effects of air pollution on habitats and species using air quality assessment.

8.35 The predicted scale of dust effects may be classified as either 'significant', or not 'significant'. Where effects are predicted to be 'significant', further mitigation is likely required before the proposals are to be acceptable under planning policy.

Air Quality and Health Effects

8.36 The main health effects of air pollution can include stroke, heart disease, lung cancer, and both chronic and acute respiratory diseases, including asthma. These conditions can lead to sickness and ill health as well as premature mortality.

[3] http://www.iaqm.co.uk/text/guidance/mineralsguidance_2016.pdf

8.37 Two recent EPA reports, *Air Quality in Ireland 2015*[4] *and Ireland's Environment, An Assessment 2016*[5] detail the main air quality trends based on monitoring from the national ambient air quality network. There are monitored exceedances of the WHO guideline values for ozone, PM_{10} and $PM_{2.5}$ at a number of sites though there are no current exceedances of the lower (less protective) EU standards at the existing monitoring locations in Ireland. The reports also highlight the main challenges of reducing air pollution from key sources such as particulate matter emissions from solid fuel burning (e.g. peat, coal and wood) in the residential sector and NOx emissions from vehicles in the transport sector.

A summary of relevant Air Quality limit values in relation to human health was presented previously in Table 8-1.

Receiving Environment

Study Area

8.38 The proposed development is located approximately 5km northeast of Bandon and 4km west of Innishannon in Co. Cork.

8.39 The existing permitted access to the site will continue in operation. All truck traffic turns right on exiting the site and travels on the country road to join the R589 regional road at Brinny Cross Roads

8.40 There is a history of sand & gravel extraction within the existing pit and manufacture of value-added road surfacing and concrete products. There is an existing concrete plant located within the site. The MSD Brinny pharmaceutical facility is located c. 0.5 km to the east of the site.

8.41 The lands surrounding the application site predominantly comprise farm fields. The application site is not subject to any statutory or non-statutory nature conservation designations. Dwellings in the vicinity of application site are generally located along the local road network and comprise farmsteads or isolated on-off residences, with some occasional small clusters. The nearest dwellings to the application site boundary are shown in Figure 8-1.

Baseline Study Methodology

Baseline Dust Monitoring

8.42 Baseline dust monitoring has been undertaken by SLR Consulting in order to measure existing baseline conditions.

8.43 Monitoring was undertaken using 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 1500mm above ground level. The input of atmospheric borne particular material into the collection bottle takes place over a pre-determined measurement period (usually one month) by

[4] Environmental Protection Agency, 2016. Air Quality in Ireland 2015 - Key Indicators of Ambient Air Quality. Available at: www.epa.ie/pubs/reports/air/quality/Air%20Quality%20Report%202015.pdf

[5] Environmental Protection Agency, 2016. Ireland's Environment, An Assessment 2016. Available at: http://www.epa.ie/pubs/reports/indicators/SoE_Report_2016.pdf

exposing it to the environment. The total dust collected in the bottle is expressed as deposition of total particulate matter (mg/m^2/day) arising from human activity in the area surrounding the application site.

PM_{10} Monitoring

8.44 The application site and surrounding area fall into Air Quality Zone D, categorised as Rural Ireland by the EPA. The nearest PM10 air quality monitoring location within a similar Zone D area is located at Macroom, Co. Cork. As such, it is considered the most appropriate dataset available for assessment of air quality baseline concentrations within the study area.

Sources of Information

8.45 A desk 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 (https://www.met.ie/climate-ireland). The EPA website was examined to note information on baseline air monitoring data around the application site (http://www.epa.ie/air/quality/data/).

8.46 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).

Field Survey / Dust Monitoring

8.47 Dust deposition surveys were undertaken at and around the application site by SLR Consulting, at monitoring locations shown in Figure 8-1. The dust deposition monitoring results recorded over this period are presented and reviewed as part of this assessment.

8.48 The locations of dust deposition monitoring stations D1 and D2 are shown on Figure 8-1.

Background Air Quality

8.49 As previously noted, the closest air quality monitoring location to the site in a similar Zone D area is located at Macroom, Co. Cork. Monitoring stations continuously monitor concentrations of particulate matter with an aerodynamic diameter of less than 10µm (PM10). Recent annual mean concentrations monitored at Macroom (published on the EPA website[6]) are presented in Table 8-3 below.

Table 8-3: Background PM10 Concentrations

Year	Annual Mean (µg/m^3)	Number of Days >50 µg/m^3
2022	16.1	7

8.50 Table 8-3 indicates that PM_{10} concentrations monitored at the Macroom monitoring site are below the annual mean Air Quality Standards (AQS) of 40µg/m^3 and comply with the

[6] Secure Archive for Environmental Research Data – http://erc.epa.ie/safer/

requirement that a 24-hour mean of 50µg/m^3 should not be exceeded more than 35 times in a calendar year.

8.51 For rural areas, such as those surrounding the application site, the primary source of PM_{10} would be residential solid fuel emissions and local agricultural or rural based activities for deposited dust.

Dust Deposition Monitoring

8.52 KRL took over operation of the facility in 2020. Dust deposition monitoring has been undertaken at and around the application site by SLR Consulting, at monitoring locations D1, and D2 shown on Figure 8-1. The dust deposition monitoring results recorded over the period 2022 – 2024 are presented in Table 8-4 below. (Note: The site was not operational in 2025).

Table 8-4: Dust Deposition Monitoring Results (2021 – 2024)

Date	D1 (mg/m^2/day)	D2 (mg/m^2/day)
25/04/2022- 25/05/2022	SC*	SC*
25/05/2022 – 29/06/2022	149	268
29/06/2022 – 29/07/2022	344	191
29/07/2022 – 28/08/2022	10	SC*
28/08/2022 – 30/09/2022	8	2
19/05/2023 – 19/06/2023	222	166
19/06/2023 – 1907/2023	SC	297
19/04/2024 – 24/05/2024	60	39
24/05/2014 – 25/07/2024	136	48
25/07/2024 – 02/09/2024	50	SC
02/09/2024 – 08/10/2024	70	SC

*SC: sample contaminated with organic matter

8.53 The dust deposition monitoring results comply with the EPA (2006) / DoEHLG (2004) recommended dust deposition limit value of 350mg/m2/day (total dust deposition averaged over a 30-day period) for the sector, measured at site boundaries using the Bergerhoff Method. This is the dust deposition emission limit value set out in condition 15 attached to planning permission ref. 24/06299 for the existing development.

Meteorology : Dispersion of Emissions

8.54 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.

8.55 Rainfall is also an important climatological parameter in the generation of dust; sufficient amounts of rainfall can suppress dust at the source and eliminate the pathway to the

receptor. According to Arup (1995)[7], rainfall greater than 0.2mm per day is sufficient to suppress dust emissions.

Local Wind Speed and Direction Data

8.56 The closest weather station with sufficient records of wind direction and wind speed considered representative of conditions experienced at the application site is Cork Airport Meteorological Station. A windrose for the average conditions recorded at Cork Airport over a ten-year period is presented in Figure 8-2. The predominant wind direction is from the south-western quadrant.

Rainfall Data

8.57 Relevant rainfall data applicable to the overall site has been obtained from the Irish Meteorological Service website for the Cork Airport Metrological Station, located approximately 15km east of the application site. The annual average days with rainfall greater than 0.2mm is 204 days per year. Natural dust suppression (from rainfall) is therefore considered to be effective for 57% of the year.

Sensitive Receptors

Ecological Receptors

8.58 The application site is not subject to any statutory nature conservation designation.

8.59 Based on the nature, size and scale of the planned development, it is considered that the maximum distance for which the project should be evaluated in terms of Natura 2000 or designated nature sites is up to a maximum radius of 2km unless there are any potential source-pathway-receptor links between the proposed development at Brinny and any Natura 2000 or designated site(s) beyond this distance. At a distance greater than 2km, and in the absence of any potential source-pathway-receptor link, it is generally considered that no Natura 2000 or designated sites would be affected by any direct loss of habitat or otherwise impacted upon.

Human Receptors

8.60 Sensitive locations are those where people may be exposed to dust from existing or planned activities. Locations with a high sensitivity to dust include hospitals and clinics, hi-tech industries, painting and furnishing and food processing. Locations classed as being moderately sensitive include schools, residential areas, and food retailers.

8.61 Receptors have been identified within a 250m distance of the application site boundary at Brinny. The relevant receptors are listed in Table 8-5 below and their locations are shown in Figure 8-1.

8.62 There are 13 sensitive receptors identified within the 250m of the application area of the application site, identified in Table 8-5 below, with details of distance from nearest main dust source – extraction area.

[7] Arup Environmental, Ove Arup and Partners (1995) The Environmental Effects of Dust from Surface Mineral Workings, HMSO, London (ISBM 11 75 3186 3)

Table 8-5: Sensitive Receptors within the 250m of the Extraction Area

Receptor Reference	Receptor	Sensitivity	Distance (m) / Direction from Extraction Area Boundary – Nearest Main Dust Source
R1	Residential	Medium	112 NE
R2	Residential	Medium	125 NE
R3	Residential	Medium	138 NE
R4	Residential	Medium	169 NE
R5	Residential	Medium	204 E
R6	Residential	Medium	307 E
R7	Residential	Medium	419 E
R8	Residential	Medium	304 NE
R9	Residential	Medium	414 NE
R10	Residential	Medium	414 NE
R11	Residential	Medium	469 E
R12	Residential	Medium	201 N
R13	Residential	Medium	212 N

Impact Assessment Methodology

Evaluation Methodology

8.63 Fugitive dust emissions and particulate matter arising from the application site activities have the potential to affect existing sensitive receptors in the area due to a potential increase in airborne dust deposition.

8.64 Increased combustion emissions (primarily oxides of nitrogen) from vehicle exhaust emissions associated with the proposed extraction and concrete production activities also have the potential to contribute to local air pollution.

8.65 The significance of impacts due to emissions from the application site are dependent upon the magnitude of the emissions, the prevailing meteorological conditions for the location, and the proximity of sensitive locations to the emission sources.

8.66 This impact assessment is based upon a comparison of the baseline (both current and projected without the new development proposals) situation against the air quality impacts resulting from the 'with development' proposal scenario. The potential for 'in-combination' effects from other planned or proposed sources or air pollutants in the area has also been considered.

8.67 Each of the activities associated with extraction development have been assessed for potential air quality impacts including:

8.68 emission from preparatory works, including stripping, placement and stockpiling of soil, access road construction (earthworks / trackout);

- emissions from sand and gravel extraction and processing

- emissions from the transfer, end-tipping and stockpiling of aggregates;
- PM_{10} contribution from operational activities; and
- traffic exhaust emissions.

8.69 The methodology used in each assessment is presented in the sub-sections below which also provide an explanation of the significance criteria to describe the impacts of the proposed development on air quality.

8.70 For the purposes of environmental assessment of releases of dust from construction and mineral activities, the classifications of PM10 and 'deposited dust' are typically applied. The impacts associated with PM10 are related to potential health impacts while deposited dust is related to potential nuisance effects. The assessment of the potential impacts of each fraction has, therefore, been undertaken separately.

Significance Criteria

8.71 The following air quality specific significance criteria have been used to assess the significance of air quality impacts in preference to overall descriptors of significance.

8.72 To determine the significance of particulate matter effects associated with the development, an evaluation of the sensitivity of the surrounding area is required. Receptors can demonstrate different sensitivities to changes in environment and are classified as per Table 8-6 below (and IAQM Construction Dust Guidance).

Table 8-6: Methodology for Defining Sensitivity to Dust and PM10 Effects

Sensitivity of area	Human receptors	Ecological receptors(a)
Very High	Very densely populated area More than 100 dwellings within 20m Local annual mean PM10 concentrations exceed the Objective -Works continuing in one area of the site for more than 1-year	European Designated sites
High	Densely populated area.--10-100 dwellings within 20m of site. Local annual mean PM10 concentrations close to the Objective (36 – 40µg/m3)	Nationally Designated sites
Medium	Suburban or edge of town Less than 10 receptors within 20m Local annual mean PM10 concentrations below the Objective (30 – 36µg/m3)	Locally designated sites
Low	Rural area; industrial area No receptors within 20m Local annual mean PM10 concentrations well below the Objective (<30µg/m3 -Wooded area between site and receptors	No designations
Notes: (a)-Only applicable if ecological habitats are present which may be sensitive to dust effects.		

8.73 Table 8-7 below illustrates how the interaction of magnitude and sensitivity results in the significance of an environmental effect, with the application of mitigation measures as per the IAQM Construction Dust Guidance.

Table 8-7: Impact Significance Matrix – Dust Effects (With Mitigation)

Sensitivity of surrounding area	Risk of site giving rise to dust or pm10 effects		
	High	Medium	Low
Very High	Slight Adverse	Slight Adverse	Negligible
High	Slight Adverse	Negligible	Negligible
Medium	Negligible	Negligible	Negligible
Low	Negligible	Negligible	Negligible

Stripping, Berm Construction, Restoration and Concrete Recycling Stage Dust Impacts - Methodology

8.74 The Institute of Air Quality Management (IAQM) assessment of risk at construction stage is determined by considering the predicted change in conditions as a result of the proposed development. The risk category for potential effects arising from preparatory site works is divided into three potential activities:

- earthworks;
- soil importation activities;
- concrete recycling; and
- trackout.

8.75 Based on the scale and nature of the works including areas, soils and operations at the site, a dust emission class is defined for each of the activities. These dust emission classes are then used to determine the risk categories presented below. These risk categories determine the potential risk of dust soiling effects assuming no mitigation measures are applied.

8.76 Table 8-8 illustrates how the interaction of distance to the nearest receptor and the dust emission class results in the determination of risk category from **earthworks activities**.

Table 8-8: Determination of Risk Category from Earthworks Activities

Distance to nearest receptor		Dust Emission Class		
Human	Ecological	Large	Medium	Small
<20	-	High Risk Site	High Risk Site	Medium Risk Site
20 – 50	-	High Risk Site	Medium Risk Site	Low Risk Site
50 – 100	<20	Medium Risk Site	Medium Risk Site	Low Risk Site
100 – 200	20 – 40	Medium Risk Site	Low Risk Site	Negligible
200 – 350	40 – 100	Low Risk Site	Low Risk Site	Negligible

8.77 Table 8-9 illustrates how the interaction of distance to the nearest receptor and the dust emission class results in the determination of risk category from **construction activities**.

Table 8-9: Determination of Risk Category from Construction Activities

Distance to nearest receptor		Dust emission class		
Human	**Ecological**	**Large**	**Medium**	**Small**
<20	-	High Risk Site	High Risk Site	Medium Risk Site
20 – 50	-	High Risk Site	Medium Risk Site	Low Risk Site
50 – 100	<20	Medium Risk Site	Medium Risk Site	Low Risk Site
100 – 200	20 – 40	Medium Risk Site	Low Risk Site	Negligible
200 – 350	40 – 100	Low Risk Site	Low Risk Site	Negligible

8.78 Table 8-10 illustrates how the interaction of distance to the nearest receptor and the dust emission class results in the determination of risk category from **trackout movements**.

Table 8-10: Determination of Risk Category from Trackout Movements

Distance to nearest receptor		Dust emission class		
Human	**Ecological**	**Large**	**Medium**	**Small**
<20	-	High Risk Site	Medium Risk Site	Medium Risk Site
20 – 50	<20	Medium Risk Site	Medium Risk Site	Low Risk Site
50 – 100	20 – 100	Low Risk Site	Low Risk Site	Negligible

8.79 Mitigation measures are recommended based on the evaluation of risk in accordance with the IAQM Dust and Air Emissions Mitigation Measures Guidance.

Operation Stage Dust Impacts - Methodology

8.80 A dust assessment has been carried out as detailed below. This assessment incorporates both the existing and the proposed development.

8.81 A staged approach has been adopted to the assessment of operations stage impacts generated by sand & gravel extraction and processing activities. This ensures that the approach taken for the assessment of risk is proportional to the risk of an unacceptable impact being caused. As such, where a simple review of the situation shows that risk of a health or nuisance impact is negligible, this will be sufficient. In cases where the risk cannot be regarded as insignificant, a more detailed assessment may be required, such as a quantitative screening assessment or an advanced dispersion modelling exercise, as appropriate.

8.82 Guidance on the assessment of the impacts of extractive operations on air quality has been prepared by the Institute of Air Quality Management (IAQM). This guidance uses a simple distance-based screening process to identify those operations where the dust impacts are unlikely to be significant and therefore require no further assessment. Where assessment that is more detailed is required, a basic assessment framework is presented which employs the Source-Pathway-Receptor approach to evaluate risk of impacts and effects.

8.83 The predicted scale of dust effects may be classified as either 'significant', or not 'significant'. Where effects are predicted to be 'significant', further mitigation is likely required before the proposals are to be acceptable.

8.84 A semi-quantitative assessment of fugitive dust emissions from the proposed extraction and processing activities has been undertaken. The assessment has been undertaken by constructing a conceptual model that takes into consideration the potential sources, surrounding receptors, and the pathway between source and receptor in order to assess the magnitude of risk of impact on local amenities.

8.85 The distance from the source to the sensitive receptor is crucial. The initial risk screening stage (Tier 1) focuses upon the potential for dust generation at the site and the distance between source and receptors. In Tier 1 of the assessment, a representative selection of dust sensitive receptors in each direction of the application site is identified within the 1km study area.

8.86 Further assessment is considered to be required for those receptors within 250m of dust generating activities with both the existing and proposed development being considered, refer to Figure 8-1. Receptors within 250m of dust generating processes progress onto a Tier 2 assessment. Other residential receptors beyond 250m are considered too far away to be impacted by potential dust from the application site and not considered any further in this assessment.

8.87 Tier 2 involves identifying source-pathway-receptor linkages and a semi-quantitative assessment of the likelihood and magnitude of any effects that could be associated with each pollutant linkage. This assessment takes account of:

- wind direction and speed data (to estimate frequency of exposure);
- proximity to source (to estimate magnitude of exposure);
- sensitivity of receptor; and
- occurrence of natural dust suppression (rainfall patterns).

8.88 This information is used to inform a semi-quantitative assessment of the likely magnitude of impact and is based upon professional experience of the assessor as the issue of dust nuisance on local receptors is a subjective issue, where public perception on what constitutes 'acceptable' levels varies from one person to the next. Assigning significance to nuisance impacts is qualitative and involves a judgement based on the likely magnitude, frequency, duration and reversibility (or recovery) of the impact. In this context, significant impact is taken to mean what is generally not publicly acceptable and desirable.

8.89 Note that the Tier 2 risk screening assessment do**es not take into account proposed mitigation measures** to be implemented at the proposed development. These will include provision of perimeter screening berms, dust suppression measures etc., identified in the section dealing with Mitigation Measures later in this Chapter.

8.90 Following the results of the risk assessment, mitigation measures are detailed, and the residual impact assessed. The detailed methodology used within the assessment is described in more detail in Appendix 8-A.

PM_{10} Contribution from Site-Based Activities : Methodology

8.91 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
- expected additional contribution of PM_{10} from site operations.

8.92 In terms of estimating the potential magnitude of impact from site operations, a UK edition of the LAQM Technical Guidance (LAQM.TG(03)) stated that fugitive dust from stockpiles and pit operations can potentially contribute up to 5µg/m^3 towards annual mean background concentrations of the coarse fraction of particulates (2.5 – 10µm diameters) in the surrounding area.

8.93 Given that the nature and scale of proposed future activities around Brinny will be comparable to pre-existing / prior activities, the potential PM_{10} impact is likely to be lower than that indicated by the LAQM guidance. To ensure a robust assessment of potential PM_{10} impacts, one approach might be to apply the upper limit of 5µg/m^3 to represent potential future development contribution to annual background / ambient PM_{10} concentrations to assess whether the Air Quality Standards objective is likely to be exceeded.

Traffic Emissions - Methodology

8.94 Atmospheric emissions related to site proposals are primarily associated with the exhaust emissions from heavy goods vehicles (HGVs). The decision as to whether an assessment of potential impact is required is based upon the criteria set out in the DMRB (Design Manual for Roads and Bridges).

8.95 The criterion for assessment of air quality contained within the latest guidance (LA 105) focuses on roads with relatively high changes in flows or high proportion of HGV traffic. Affected roads are defined as those that meet any of the following criteria:

- road alignment will change by 5m or more; or
- daily traffic flows will change by 1,000 Annual Average Daily Traffic (AADT) movements or more; or
- HGV flows will change by 200 AADT or more; or
- daily average speed will change by 10 km/hr or more; or
- peak hour speed will change by 20km/hr or more.

Assessment Of Impacts

Stripping, Berm Construction, Restoration and Concrete Recycling Stage Impacts – Assessment

8.96 An overview of the sources and processes associated with the preparatory site works and the construction / infrastructure installation activities, and their respective potential for dust deposition (both dust and smaller particles), is presented below in Table 8-11.

Table 8-11: Site Activities: Sources of Dust Emissions

Activity	Source	Emission potential	Comments
Concrete Recycling, Earthworks and Trackout	Excavators / Dozers / HGVs	High - dry or fine materials during strong windy weather	Temporary, variable from day to day depending on prevailing meteorological conditions, level, and location of activity.
		Small – coarse or wet materials during conditions of low wind speed	Soils immediately used to construct screening berms, used in restoration works or placed in temporary stockpiles.

8.97 During the site preparatory works (comprising soil stripping, screening berm construction, initial sand and gravel excavation, materials transfer, landscaping and restoration works) will be completely confined within the application site.

8.98 Considering this, together with the separation distance to receptors and the boundary screening provided by existing vegetation, and with dust suppression / mitigation measures in place as set out in the Mitigation Measures section below the dust risk category for these construction activities is assessed 'Negligible' risk' .

8.99 A summary of the determined risk category for the various activities around the application site is presented in Table 8-12 below.

Table 8-12: Site Activities: Risk of Dust Emissions

Source	Risk of dust soiling effects	Ecological effects
Earthworks	Negligible	Negligible
Construction	Negligible	Negligible
Trackout	Negligible	Negligible

Operational Stage Dust Impact – Assessment

8.100 When commenced and operational, the principal air quality impacts generated by the sand & gravel pit and operation activities will be dust and traffic related emissions. An overview of the sources and processes associated with the extraction activities, and their respective potential for dust deposition, is presented Table 8-13 below.

Table 8-13: Sources of Particulate Emissions

Activity	Source	Emission potential	Comments
Material transfer to processing area	On-site vehicle, Dry loose material.	High when dry material being handled during strong windy weather	Emissions due to prevailing meteorological conditions and amount of dry loose material. Emissions due to re-suspension of loose material on surfaces.
Processing of sand and gravel	Processing plant, Dry loose material	High when dry material being processed during strong windy weather	Emissions due to prevailing meteorological conditions (high winds).

Activity	Source	Emission potential	Comments
Material transfer to storage area	On-site vehicle, Dry loose material	High when dry material being handled during strong windy weather	Emissions due to prevailing meteorological conditions and amount of dry loose material. Emissions due to re-suspension of loose material on surfaces.
Material storage	Dry loose material in stockpiles	High when dry material being stored during strong windy weather	Emissions due to prevailing meteorological conditions (high winds).
Material loading to HGV	On-site vehicle, Dry loose material	High when dry material being handled during strong windy weather	Emissions due to prevailing meteorological conditions and amount of dry loose material. Emissions due to re-suspension of loose material on surfaces.
Transfer off site / traffic off site	HGV / Road vehicles	Low - on paved road surfaces	Dependent on the amount of loose material on road surface available for re-suspension and track out.

Human Receptors

8.101 A total of 13 receptors were identified within the c.250m study area around the application site. These receptors have progressed onto a Tier 2 assessment as they are considered to have a greater risk of dust impact. Each receptor is assessed against the frequency of exposure and the distance from the source to the receptor (i.e. the pathway) in accordance with the methodology described in Appendix 8-A.

8.102 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. Representative data on the local wind climate is therefore required for this section of the assessment.

8.103 The wind-rose presented in Figure 8-2 (for Cork Airport Meteorological Station) indicates that the predominant wind direction is from the south-west. The potential for the generation of airborne dust will increase with wind speed, with winds greater than 3m/s capable of carrying airborne dust[8].

8.104 A wind rose showing the frequency of winds at wind speeds of greater than 2m/s is presented in Figure 8-2 with the individual frequencies for each 10-degree compass sector used within the assessment. In this assessment, wind speeds over 2m/s were used as this is how the data on percentage occurrence of wind frequency and wind speed is calculated and presented by Met Eireann. For this reason therefore, the impact assessment presented herein is conservative.

8.105 A summary of the risk assessment of dust impacts at the selected Tier 2 properties / locations arising from the proposed development activities (in the absence of any mitigation measures) is presented in Table 8-14 below. The risk assessment was carried out from the using the distance and direction from the overall site extraction boundary, the extraction will be carried out in a number of phases and the assessment represents the worst case scenario.

[8] Department of the Environment, Transport and the Regions, 1995. The Environmental Effects of Dust from Surface Mineral Workings – Volume 2. Technical Report. December 1995.

Table 8-14: Dust Risk Assessment Screening (Without Mitigation Measures)

Receptor reference	Distance from Extraction Area Boundary – Nearest Main Dust Source (m)	Relevant wind direction [a]	Potential exposure duration [b]	Relative wind / distance rank (risk evaluation) [c]	Risk Evaluation (Without Mitigation)
R1	112 NE	230 - 250	6.7	3/5 (15)	Slight Adverse
R2	125 NE	230 - 250	6.7	3/5 (15)	Slight Adverse
R3	138 NE	230 - 250	6.7	3/5 (15)	Slight Adverse
R4	169 NE	230 - 250	6.7	3/5 (15)	Slight Adverse
R5	204 E	260-280	4.3	2/4 (8)	Acceptable
R6	307 E	260-280	4.3	2/3 (6)	Insignificant
R7	419 E	260-280	4.3	2/2 (4)	Insignificant
R8	304 NE	230-250	6.7	3/3 (9)	Acceptable
R9	414 NE	230-250	6.7	3/2 (6)	Insignificant
R10	414 NE	230-250	6.7	3/2 (6)	Insignificant
R11	469 E	260-280	4.3	2/2 (4)	Insignificant
R12	201 N	170-190	3.4	2/4 (8)	Acceptable
R13	212 N	170-190	3.4	2/4 (8)	Acceptable

Table Notes:

[A] – relevant wind direction based on upwind sector which would potentially convey from site towards the receptor.

[B] – Potential duration of exposure based on frequency of moderate to high wind speed (adjusted for dry days only) as described in the methodology in Appendix 8-A.

[C] – Ranking as per methodology in Appendix 8-A

Refer to Figure 8-1 for Receptor Locations

8.106 From Table 8-14 above, it is observed that the risk of impact from dust emissions associated with the proposed development at Brinny(without any mitigation measures in place) varies from:

- Slight Adverse at R1 to R4,
- Acceptable or Insignificant at receptors R5 to R13
-
- (Note: For any other receptors at distances greater than 250 metres (refer to Figure 8-1) the dust risk will be Acceptable or less, without any mitigation measures in place)
-

8.107 Note that this assessment **does not take into account** implementation of mitigation measures within the proposed development that will significantly reduce the risk level including provision of perimeter screening berms and strengthened boundary vegetation / screen planting, dust suppression measures etc. (as outlined in the Mitigation Measures section below). The assessment is also considered to be conservative on the basis of the

moderate wind speeds included in the risk evaluation and the overall site extraction boundary instead of phased approach.

Designated Ecological Sites

8.108 The application site is not subject to any statutory nature conservation designation.

8.109 Based on the findings of the semi-quantitative assessment above, the fact that the nearest designated nature site (Bandon Valley pHNA) is: located at a significantly greater distance (approximately c.1 8km away at its closest point); is separated and screened from the site by intervening topography hedgerows and trees, it is concluded that the planned development will have an insignificant dust deposition impact and that it can be screened out from any further dust impact assessment.

Traffic Emissions - Assessment

8.110 The maximum number of HGV movements will be one to two HGV trips per hour based on a maximum annual total output / import of 120,000 tonnes per year, 50 week year, 5.5 day week ,11 hour full day and 28 tonne (aggregates / inert soil) or 8 cu. metre (concrete) HGV

8.111 In view of the fact that none of the roads in the surrounding local road network meet any of the traffic / alignment criteria set out in LA 105, it is considered that the extent of any traffic related change arising from future development activity can be deemed ‘negligible’ in terms of its resultant impact on local air quality and that no further air quality assessment is necessary.

8.112 On this basis, the impact of combustion emissions (primarily oxides of nitrogen) from vehicle exhaust emissions associated with the transfer and/or transportation of materials are screened out, and it is determined that there is no potential for emissions to contribute to local air pollution.

PM_{10} Contribution from Extraction / Production Activities - Assessment

8.113 In terms of PM_{10}, the maximum annual mean measured baseline background concentration is taken as 16.1 ug/m³ for 2022 at the Macroom monitoring station. Therefore, the potential contribution up of 5 µg/m³ towards annual mean background concentrations of the coarse fraction (2.5 – 10 µm diameters) of particulates (in the immediate area of the site) is insignificant and well below the annual objective of 40 µg/m³.

8.114 The potential impacts in relation to increase in ambient PM10 concentrations beyond the site boundary can be classified as ‘negligible’.

Unplanned Events (Accidents)

8.115 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 extraction and concrete production activities.

8.116 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 have an effect on the local area:

- equipment malfunction;
- accidental material spillages during transport.

8.117 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 PM10 concentration immediately surrounding the site. However, these are not considered to be significant given the limited duration of such meteorological conditions and the likely limited scale of any incident. (Note: The mitigation and management measures implemented – e.g. maintenance of plant & equipment will minimise / eliminate the occurrence of any unplanned events).

Cumulative / Synergistic Impacts

8.118 In essence, cumulative impacts are those which result from incremental changes caused by other past, present or reasonably foreseeable actions 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.

8.119 This air quality impact assessment herein indicates that the planned development activities will not contribute to a significant increase in local air pollution by way of excessive air / dust emissions. There are no other significant sources of air emissions approved or planned within 2km of the application site and no potential for significant cumulative impacts has been identified.

8.120 The cumulative impact of the proposed development is therefore classified as insignificant.

Interaction with Other Impacts

8.121 The potential impact on air quality by the project on sensitive receptors including sensitive ecological receptors and people living in the area has been fully assessed in this chapter. The overall impact of the project on these receptors is further considered in Chapter 4 Population and Human Health and Chapter 5 Biodiversity.

Mitigation Measures

Dust Suppression & Control Measures

8.122 A large range of dust suppression and control measures are and will continue to be implemented at the application site at Brinny. Specific measures are provided in Table 8−15 below and these are best environmental management practice as set out in the DoEHLG (2004) and EPA (2006) guidelines for the sector.

Table 8-15: Particulate Emission Mitigation Measures

Source / receptor	Emission potential	Recommended mitigation measures	Effectiveness
Excavators / HGV Loading	High – dry or fine material during strong windy weather	Minimise drop heights when handling materials. Maximise use of excavated soil in construction of vegetated screening berms or in pit restoration works. Dampen materials using sprinklers or water bowser	High
	Low – material of high moisture content during conditions of low wind speed	Minimise drop heights when handling material. Protect from wind where possible.	High
On-site Vehicles	High when travelling over un-surfaced and dry site roads.	Minimise length of on-site haul routes.	High
		Use of sprinklers / water bowser to dampen haul routes during dry weather periods.	High
		Restrict vehicle speeds to less than 20kph. Install signage and undertake staff training.	High
		Routing of traffic and away from any surrounding sensitive receptors.	High
Road Vehicles (transfer off-site)	Low / Moderate on paved road surfaces	Use of road sweeper to reduce the amount of material available for re-suspension.	Moderate / High
		Travel over paved surfaces / access road.	High
		Direct all HGVs through wheelwash facility	High
Stockpiles	High when dry or fine material being stored or handled during strong windy weather	Seed / vegetate surfaces of completed perimeter mounds and stockpiles of restoration soils.	High
		Locate stockpiles to take advantage of any available shelter from wind.	High
		Use of sprinklers / bowser to moisten materials during periods of dry and windy weather	High
		Limit mechanical disturbance of materials more likely to become airborne and/or time operations having regard to expected weather conditions	High
Slight Adverse Risk Receptors	High – during dry and strong windy weather	Hardstanding areas/site roads, stockpiles with the potential to give rise to dust will be regularly watered as appropriate during dry and/or windy conditions by dust canon, sprinklers or water bowser. Phased work operations and restoration will reduce the impact of the dust emissions.	High

8.123 When adverse conditions apply (dry, windy weather), water from a bowser will be sprayed on dry unpaved road / track surfaces in order to minimize dust rise. Any paved surfaces around the site and/or along the access road leading in and out of the development will also be sprayed as required.

8.124 All heavy goods vehicles leaving the application site will be routed through the existing wheelwash facility at the road in order to remove and / or dampen any particulate materials attaching to the undercarriage and to prevent transport of fine particulates off-site, onto the local public road network.

8.125 Effective site management practices are critical to demonstrate the willingness of the operator to control dust emissions. Monitoring of dust deposition and recording of any complaints shall be carried out to take appropriate measures to reduce emissions in a timely manner.

8.126 Training on dust mitigation measures shall be provided to site-based staff. Training will also cover an 'emergency preparedness plan' to react quickly in case of any failure of dust mitigation measures.

8.127 Dust suppression (water spray / sprinkler system) will be provided along the internal road from the access to the processing / ancillary facilities area. For other areas a water bowser will be available at all times to dampen down unpaved surfaces when adverse (dry, windy) conditions apply.

Residual Impact Assessment

8.128 With the range of mitigation measures to be implemented and design measures to be incorporated into the working scheme (phasing of extraction and restoration, refer to Chapter 2 and EIAR Figure 2-5), it is considered that the risk of dust related impacts at receptors generated by the proposed site activities will be further reduced.

8.129 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 which could cumulatively impact the site or the surrounding area. Overall, the effects of the proposed development on air quality have been considered to be insignificant to acceptable. A summary of the residual dust risk impact assessment at the closest sensitive receptors is provided in Table 8-16 below.

Table 8-16: Residual Dust Risk Assessment (With Mitigation Measures)

Receptor reference	Risk evaluation
R1	Acceptable
R2	Acceptable
R3	Acceptable
R4	Acceptable
R5	Insignificant
R6	Insignificant
R7	Insignificant

Receptor reference	Risk evaluation
R8	Insignificant
R9	Insignificant
R10	Insignificant
R11	Insignificant
R12	Insignificant
R13	Insignificant

8.130 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.

(Note: On this basis it is also clear that for all other receptors at distance greater than 250 metres (refer to Figure 8-1) the dust impact will be Insignificant)

Dust Deposition Monitoring

Dust Monitoring Methodology

8.131 Dust deposition monitoring will continue to be undertaken at the application site for the duration of extraction activities at the proposed development (in accordance with EPA and DoEHLG guidelines) using the Bergerhoff Method, and the requirements of condition 15 attached to planning permission 24/06269.

Dust Monitoring Locations

8.132 The existing dust deposition monitoring locations, D1 and D2 are shown on Figure 8-1. Location D1 is representative of the existing site boundary closest to the operational area. Location D2 is representative of receptors to the south of the site.

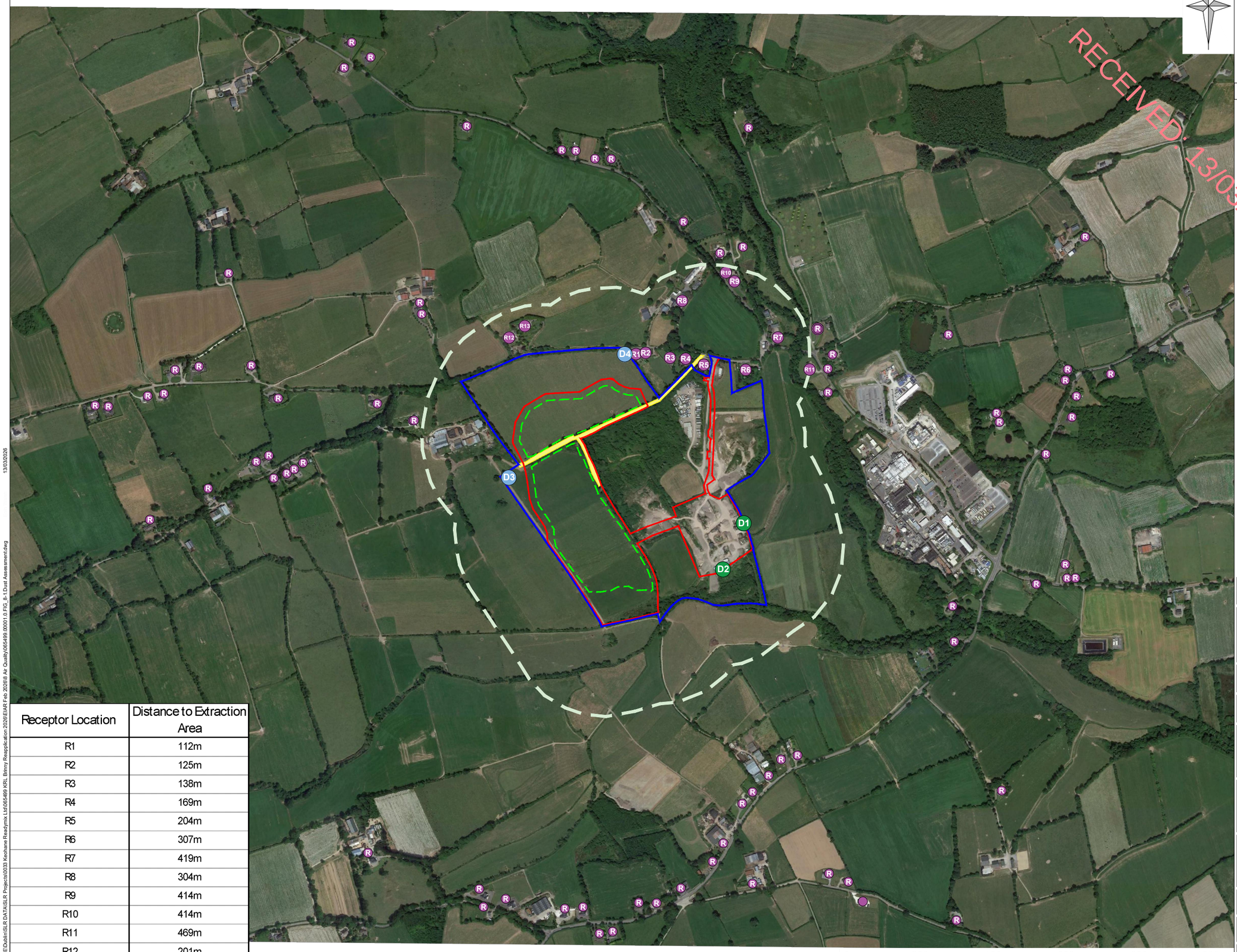
8.133 It is proposed to add two additional dust monitoring locations D3 and D4 as part of the proposed developments, refer to EIAR 8-1. Location D3 will be representative of nearby receptors R12 and R13 to the north of the site. Location D4 will be representative of receptors to the west of the site.

Monitoring Results - Reporting

8.134 Dust monitoring locations shall be reviewed and revised where and as / when necessary. The results of the dust monitoring shall be submitted to Cork County Council on a regular basis for review and record purposes.

Figures

Figure 8-1: Dust Monitoring & Receptor Locations



Receptor Location	Distance to Extraction Area
R1	112m
R2	125m
R3	138m
R4	169m
R5	204m
R6	307m
R7	419m
R8	304m
R9	414m
R10	414m
R11	469m
R12	201m
R13	212m

Notes:

1. Background Mapping Extract from Google Earth.

Legend:

- APPLICANTS LAND INTEREST (c. 43.2 Ha)
- APPLICATION AREA (c. 18.3 Ha)
- EXTRACTION AREA
- EXISTING WAYLEAVE
- R8 — RECEPTOR LOCATION
- D1 — DUST MONITORING LOCATION
- D3 — PROPOSED ADDITIONAL DUST MONITORING LOCATION
- 250m RADIUS FROM APPLICATION AREA

0 200 400 600 800 1000m

Scale 1:10,000

Rev	Amendments	Date	By	Chk	Auth

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Drawing Status & Suitability Code: **PLANNING**

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Scale	SLR Project No.
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Designed	Drawn	Checked	Authorised
EW	EW	TP	TP
Date: 03/26	Date: 03/26	Date: 03/26	Date: 03/26

Drawing Number: **FIGURE 8-1** Rev. **0**

13/03/2026

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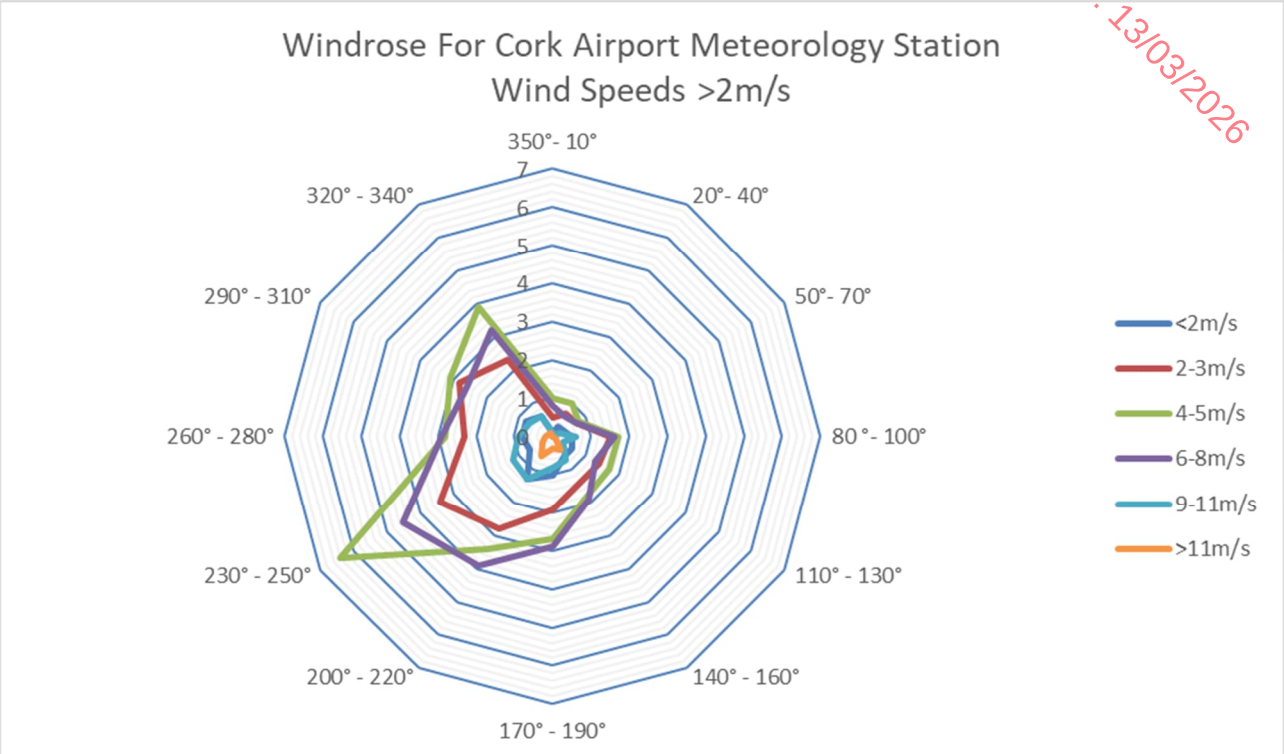
Figure 8-2: Windrose for Cork Airport Meteorological Station



Appendix 8-A Dust Risk Screening Assessment Methodology

The methodology applied in the assessment is a semi-quantitative risk assessment methodology, in which the probability of an impact occurring and the magnitude of the impact, if it were to occur, are considered. This methodology is the Tier 2 assessment of the dust assessment methodology. In the event that identified dust sensitive receptors are not screened out within Tier 1, this approach provides a mechanism for identifying the areas where mitigation measures are required, and for identifying mitigation measures appropriate to the risk presented by the development (i.e. the assessment does not take account of proposed mitigation being put in place).

The magnitude of the potential risk at each receptor is classified depending on the frequency of exposure and the distance from the site to the receptor. Frequency of exposure is represented by the percentage of moderate to high winds (over 3m/s) from the direction of the site.

The screening assessment tool assesses the significance of the distance from site and the frequency of exposure of each receptor by assigning a ranked number. Receptors with a higher potential for dust impacts would therefore result in a higher value whilst receptors with lower potential would expect to carry a lower value. The value corresponding to an evaluation of risk is a product of the significance of the distance and frequency of exposure, each is assigned a value representing its significance. The multiplication of the two values assigned gives a total, which is then corresponded to a qualitative term of risk magnitude.

Frequency of Exposure Criterion

The potential for any site to emit dust is greatly influenced by weather. Increased wind speed increases the potential for the generation of airborne dust due to the suspension and entrainment of particles in airflow. A worst-case situation would be strong, warm, drying winds which increase the rate at which dust is lifted from an untreated surface and emitted into the air. Wind can also have the effect of spreading dust over a large area. Conversely, rainfall decreases dust emissions, due to both surface wetting and increasing the rate at which airborne dust is removed from air. An article on dust generation from quarry/pit operations[9] suggests that rainfall of greater than 0.2mm per day is considered sufficient to effectively suppress windblown dust emissions.

The frequency of exposure to dust emissions represents the percentage of time that wind speeds capable of carrying airborne dust (greater than 3m/s) are blowing from the site to the direction of the receptor. Frequencies are calculated based on meteorological data. For screening assessment wind speeds greater than 2m/s were considered as this is how data on percentage occurrence of wind frequency and wind speed is calculated and presented by Met Eireann. For this reason, the assessment is considered to be conservative.

For the screening assessment, a value of 1mm would be used for the criteria to classify days as ‘dry’ or ‘wet’; five times the recommended value, using annual average rainfall data. The average number of days when rainfall exceeds 1mm would be provided for each month and calculated over the year to provide an average.

The resulting frequency of moderate to high wind speeds with the potential of carrying airborne dust towards receptors would then be classified into the criteria in Table 8-A-1 with the respective rank value assigned.

[9] Leeds University. Good Quarry. http://www.goodquarry.com/article.aspx?id=55&navid=2

Table 8-A- 1:Frequency of Exposure – Risk Classification

Risk category	Criteria
1	Frequency of winds (>2 m/s) from the direction of the dust source on dry days are less than 3%
2	The frequency of winds (>2 m/s) from the direction of the dust source on dry days are between 3% and 6%
3	The frequency of winds (>2 m/s) from the direction of the dust source on dry days are between 6% and 9%
4	The frequency of winds (>2 m/s) from the direction of the dust source on dry days are between 9% and 12%
5	The frequency of winds (>2 m/s) from the direction of the dust source on dry days are between 12% and 15%
6	The frequency of winds (>2 m/s) from the direction of the dust source on dry days are greater than 15%

Distance to Source Criterion

In assessing dust impacts, the distance from the source to the sensitive location is crucial, as airborne and deposited dust tend to settle out close to the emission source. Smaller dust particles remain airborne for longer, dispersing widely and depositing more slowly over a wider area.

Guidance indicates that larger dust particles (greater than 30µm) will largely deposit within 100m of sources. Smaller particles (less than 10µm) are only deposited slowly. Concentrations decrease rapidly on moving away from the source, due to dispersion and dilution.

To allow for this effect of distance, buffer zones are often defined by mineral planning authorities around potentially dusty activities to ensure that sufficient protection is provided. They have not been established in any rigorous scientific way, but usually range from 50m to 200m. The 1995 UK DoE Guidance on dust from surface mineral working's, however, recommends a stand-off distance of 100-200m from significant dust sources (excluding short-term sources), although it is recognised that these distances can be reduced if effective mitigation measures are identified and implemented. In terms of identifying sensitive locations therefore, and to represent an extreme worst-case scenario, consideration only needs to be given to sensitive receptors within 250m of the site boundary. Receptors at a distance greater than 250m have therefore been screened out in Tier 1 of the assessment. The criteria for classifying the distance from receptor to source and thus assigning a rank value has therefore been based on the various references to dust behaviour described above. The rank classifications are presented below in Table 8-A-2.

Table 8-A- 2: Distance to Source – Risk Classification

Risk category	Criteria
1	Receptor is more than 500m from the dust source
2	Receptor is between 400m and 500m from the dust source
3	Receptor is between 300m and 400m from the dust source
4	Receptor is between 200m and 300m from the dust source
5	Receptor is between 100m and 200m from the dust source
8	Receptor is less than 100m from the dust source

Sensitivity of Receptors

Sensitive locations are those where the public may be exposed to dust from the site. Locations with a high sensitivity to dust include hospitals and clinics, hi-tech industries, painting and furnishing and food processing. Locations classed as being moderately sensitive include schools, residential areas and food retailers. Table 8-A-3 below[10] shows examples of dust sensitive facilities.

Table 8-A-3: Examples of Dust Sensitive Facilities

High sensitivity	Medium sensitivity	Low sensitivity
Hospitals and clinics	Schools and residential areas	Farms
Retirement homes	Food retailers	Light and heavy industry
Hi-tech industries	Greenhouses and nurseries	Outdoor storage
Painting and furnishing	Horticultural land	
Food processing	Offices	

Evaluation of Risk

Once a rank value has been assigned to the frequency of exposure and distance to source, an overall risk can be evaluated by combining the two risk categories, along with consideration of the sensitivity of the receptor. For low sensitivity receptors the risk of dust impact is considered to be significantly lower than for medium and high sensitivity receptors. Therefore, a factor of 0.5 would be applied to the final risk evaluation ranking.

For each receptor, the relative magnitude of risk is given by identifying which of the score categories in Table 8-A-4 it falls into. This final evaluation represents the risk of dust impacts prior to control and mitigation measures being employed on site.

Table 8-A-4: Risk Evaluation Ranking (Without Mitigation)

Magnitude of risk	Score
Insignificant	7 or less
Acceptable	8 to 14
Slight Adverse	15 to 24
Moderate Adverse	25 or more

[10] Ireland M. (1992) "Dust: Does the EPA go far enough?", Quarry Management, pp23-24.