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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 new sand and gravel extraction development at Derryarkin townland, Croghan, Rhode, Co. Offaly.

8.2 The proposed development would extract up to 100,000 tonnes of sand and gravel per annum with processing of the extracted materials undertaken onsite to produce a range of aggregates for offsite transfer and use by the applicant within their existing batching facility located c.600m northwest and other external BD Flood sites.

8.3 The proposed development will have the potential to generate fugitive dust emissions and particulates (PM_{10}), which may result in impacts on local air quality. Combustion emissions (primary PM_{10}, and oxides of nitrogen) from vehicle emissions associated with the transportation of materials also have the potential to impact on local air pollution.

8.4 Full details of the proposed development, site activities, environmental management systems and controls at the application sites are provided in the Chapter 2 of this EIAR.

8.5 The main elements of the the proposed development assessed with respect to air quality are:

- An overall application area of c. 19.5 hectares;
- Phased extraction of sand and gravel (wet working) over an area of c. 11.7 hectares with processing that includes crushing and screening and all ancillary works and structures;
- Provision of new site facilities to include wheelwash (c. 35m²), weighbridge (c. 69m²); mobile welfare pod facility (c. 16m²) consisting of office, canteen, toilet and drying room; dedicated parking area, perimeter vegetation planting and fencing.
- Access to the site will be via an existing entrance onto the local access road to the north of the site;
- Progressive restoration of the site to naturally regenerated wildlife habitat and a permanent water body;
- The proposed development life is for 15 years to complete extraction and restoration operations.

Scope of Work

8.6 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.

8.7 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').

8.8 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 are minimised.

Consultations / Consultees

8.9 In preparing this Environmental Impact Assessment Report a MS Teams pre-planning consultation meeting was held between officials of Offaly County Council (Planning

Department and Edenderry Municipal District Office), BD Flood and SLR on the 12th September 2024 (pre-planning ref. no. ED2423).

8.10 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 for the assessment of air quality impacts.

8.11 Feedback of most relevance to the assessment of air quality was received from the Health Service Executive Environmental Health Services.

8.12 The HSE comments were made in relation to environmental health protection and it noted that '*An air quality assessment should be carried out following procedures described in the publications by the EPA and using the methodology outlined in the guidance documents published by the USEPA. An air dispersion model was created using input data which consisted of information on the and five full years of meteorological data*"

8.13 Due to the scale and mineral type for the proposed development, and the few receptors in close proximity to the site, detailed dispersion modelling has not been undertaken, however the screening assessment that has been undertaken and follows the Institute of Air Quality Management (IAQM) guidance does include consideration of the physical environment, design details from all emission sources on-site and an analysis of multiple years of meteorological data.

Contributors / Author(s)

8.14 The air quality impact assessment (AQIA) 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 Members of the Institute of Air Quality Management (MIAQM)) and Jemima Hill, Senior Consultant, Associate Member of the IAQM.

Limitations / Difficulties Encountered

8.15 This assessment is compiled based on published regional and local data, guidance documents, and site-specific field surveys.

8.16 The dust assessment is primarily a tool to identify the proportionate level of mitigation required.

8.17 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.

8.18 It is assumed that mitigation measures set out within the assessment would be secured should planning consent be granted.

Regulatory Background

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

Legislation

Air Quality Standards

8.20 The Ambient Air Quality Standards Regulations (AAQSR) 2022[1] 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.

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

8.22 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).

8.23 Monitoring stations across the country assess air quality, ensuring compliance with EU directives and providing public access to data.

8.24 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)

Limit, Target Value or Objective				
Pollutant	Averaging Period	Value	Maximum Number of Allowed Occurrences	Source
Nitrogen Dioxide (NO_2)	1-hour	200 µg/m^3	18	AAQSR
	Annual	40 µg/m^3	0	AAQSR
Particulate matter with aerodynamic diameter of less than 10 µm (PM_{10})	24-hour	50 µg/m^3	35	AAQSR
	Annual	40 µg/m^3	0	AAQSR
Particulate matter with aerodynamic diameter of less than 2.5 µm ($PM_{2.5}$)	Annual	20 µg/m^3	-	AAQSR

8.25 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 at 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**).

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

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

8.26 Ecological receptor sites of nature conservation importance at a European, national and local level are provided environmental protection with respect to air quality. EPA guidance[2] 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 (Cle) for airborne concentrations and Critical Loads (Clo) for deposition to land from air. The Cle for oxides of nitrogen (NO_x) is an annual mean of 30 µg/m^3. The Clo is site specific depending on habitats and designated features.

Nuisance (Dust Deposition)

8.27 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.

8.28 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 is highly subjective.

8.29 A range of monitoring techniques exists for dust deposition rates (i.e., Bergerhoff and Frisbee gauges).

8.30 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^2/day (total dust deposition averaged over a 30-day period), measured at site boundaries.

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

Planning Policy and Development Control

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

8.31 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.

8.32 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"

8.33 The air quality objectives assessed according to industry accepted methodology for EIA are identified in **Table 8-1**.

Local Planning Policy – Offaly County Development Plan 2021 – 2027

8.34 The current Offaly 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:

- ***Policy ENVO-09****: It is an objective of the Council to reduce harmful emissions and achieve and maintain good air quality for the county.*
- ***Policy ENVO-10****: It is an objective of the Council to actively promote measures to reduce air pollution and combat climate change including promotion of energy efficient buildings, cleaner home heating, green infrastructure, active and public transport modes, electric vehicles and innovative design solutions.*
- ***Policy ENVO-11****: It is an objective of the Council to promote sustainable design and construction to help reduce emissions from the demolition and construction of buildings.*
- ***Policy ENVO-12****: It is an objective of the Council to work with relevant agencies to support local data collection in the development of air quality monitoring.*
- ***Policy ENVP-17****: It is Council policy to manage air quality in accordance with relevant legislation and policy.*
- ***Policy ENVP-18****: It is Council policy to promote the preservation of best ambient air quality compatible with sustainable development in accordance with the EU ambient Air Quality and Cleaner Air for Europe (CAFE) Directive (2008/50/EC) and ensure that all air emissions associated with new developments are within Environmental Quality Standards as set out in the Air Quality Standards Regulations 2011, or any updated/superseding documents.*
- ***Policy ENVP-19****: It is Council policy to require activities likely to give rise to air emissions to implement measures to control such emissions and to undertake air quality monitoring. Application of this policy will take into account instances whereby activities are licensed by other bodies through other processes (such as Integrated Pollution Control Licensing or Industrial Emissions Licensing).*

Assessment Guidance

8.35 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 2nd 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

8.36 The area surrounding the proposed application area largely comprises cutaway bog, existing sand and gravel extraction wet-working developments and forestry, with few dwellings in the immediate vicinity.

8.37 Beyond the boundaries of the site to the north and west, the landscape is dominated by agricultural land, with most of the mixed sized fields under pasture. While field boundaries are typically straight, unless following a stream/river, fields are often irregularly shaped, with few boundaries meeting at a right angle. These field boundaries are typically marked by dense, low-cut hedgerows or hedgerows lined with mature trees. In some cases, hedgerows are replaced by post & wire fencing, creating an appearance of very large fields.

8.38 To the south and east of the site, the landscape is dominated by cutover bogs, formerly worked at an industrial level. Large areas have been left untouched for years and have been densely colonised by locally occurring scrub species. However, some areas of bare cutover bog or only colonised by low grass species also remain. Some areas have been planted with forestry plantations, including the land to the immediate east and north-east of the site and across the R400 to the south-west. Within 2km to the south and east of the site there are also several active and disused wet working sand and gravel pits. These have made use of the sand and gravel reserves underlying the remaining peat material, in a similar fashion to the proposed development.

8.39 There is no large settlement within the vicinity of the site. The small village of Rhode, c. 5 km to the southeast, and Rochfortbridge c. 5km to the north being the only formal settlements. There are several individual dwellings and ribbon development along the local roads to the south-east. The closest residential properties to the site are located to the southwest, being

c. 180-260m from the proposed extraction area, as presented in **Figure 8-1**. Most residences comprise isolated farm dwellings and of owner-occupied bungalow/residences. There are no large residential settlements close to the site.

8.40 The surrounding land use to the northwest and west is dominated by the existing Derrycoffey sand and gravel pit development within which sits the existing BD Flood concrete batching facility.

8.41 The application site is located on land used predominantly for agriculture or forestry plantation. To the south and east, the site is bounded by a further block of plantation woodland and pastural farmland.

8.42 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.

Sources of Information

Desk Top Studies

8.43 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 (Mullinger synoptic weather station 2005–2024 averages (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/).

8.44 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

8.45 Baseline dust monitoring was undertaken between February and June 2025 at the Application Site boundary. The dust monitoring locations are shown in **Figure 8-1** and referenced D1 to D3.

8.46 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 environment. The total dust collected in the bottle is expressed as deposition of total particulate matter (mg/m^2/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 350mg/m^2/day.

Background Air Quality

Local Air Quality Monitoring

8.47 A desk study has been carried out to examine all relevant information relating to air quality conditions around the application site.

8.48 The application site and surrounding area fall into Air Quality Zone D, categorised as rural Ireland by the EPA.

8.49 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), which 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.

8.50 The closest national air quality monitoring location to the application site in a similar Zone D area is located in 'Edenderry' c. 13 km to the southeast. This site monitors levels of NO_2, NO_x PM_{10} and $PM_{2.5}$.

8.51 Recent annual mean concentrations monitored at Edenderry (published on the EPA website[3]) are presented in **Table 8-3** and **Table 8-4**.

Table 8-3: PM Monitoring data at Edenderry (2023)

Monitoring Station	Annual Mean PM_{10} Concentration ($\mu g/m^3$)	Number of Days PM_{10} >50$\mu g/m^3$	Annual Mean $PM_{2.5}$ Concentration ($\mu g/m^3$)
Edenderry	16.3	6	12.4

Table 8-4: NO_2 Monitoring data at Edenderry (2023)

Monitoring Station	Annual Mean NO_2 Concentration ($\mu g/m^3$)	Number of Hours NO_2 >200$\mu g/m^3$	Annual Mean NO_x Concentration ($\mu g/m^3$)
Edenderry	8.6	0	13.5

8.52 The tables above indicate that NO_2 and PM concentrations monitored are below the annual mean AQALs and there are no exceedances of the 1-hour NO_2 or the 24-hour PM_{10} 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

8.53 A 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[4] have been sourced and presented in **Table 8-5**.

[3] https://www.epa.ie/environment-and-you/air/0 [Accessed May 2025)
[4] Environmental Protection Agency (2024) Air Quality in Ireland Report 2023

Table 8-5: EPA Background Modelled Data (2023)

Pollutant	Mapped Background Concentration within Study Area (µg/m^3)
NO_2	5-10
PM_{10}	7-10
$PM_{2.5}$	6-8

Dust Deposition Monitoring

8.54 The results of the dust deposition monitoring undertaken at the 3 no. locations around the site boundary in 2025 are presented in **Table 8-6**.

Table 8-6: Dust Deposition Monitoring Results – 2025

Monitoring Location	Feb 2025	Mar 2025	April 2025	May 2025	June 2025
	Total Deposition (mg/m^2/day)				
D1	55	947	146	184	613 (80)
D2	29	1150	66	53	70
D3	29	872	39	3164 (2788)	110
Table Notes: Where numbers are provided in brackets, this depicts the 'inorganic' fraction, as a result of further analysis undertaken on the collected sample					

8.55 All monitoring locations were shown to be consistently below the limit of 350 mg/m^2/day during the monitoring period in February and April, however all monitoring locations exceeded the limit in March by at least 522 mg/m^2/day. It was noted that during this time period that, a field adjacent to the monitoring locations was sprayed for tillage and reseeding which may have impacted dust monitoring undertaken throughout this period. Other exceedances throughout the monitoring period included at D3 in May and D1 in June. Each sample jar showed major discoloration and turbidity due to organic matter.

8.56 It is noted that D3 is downwind (northeast) of a forestry plantation to the south west which may increase organic deposition within the sample, affecting the results.

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.

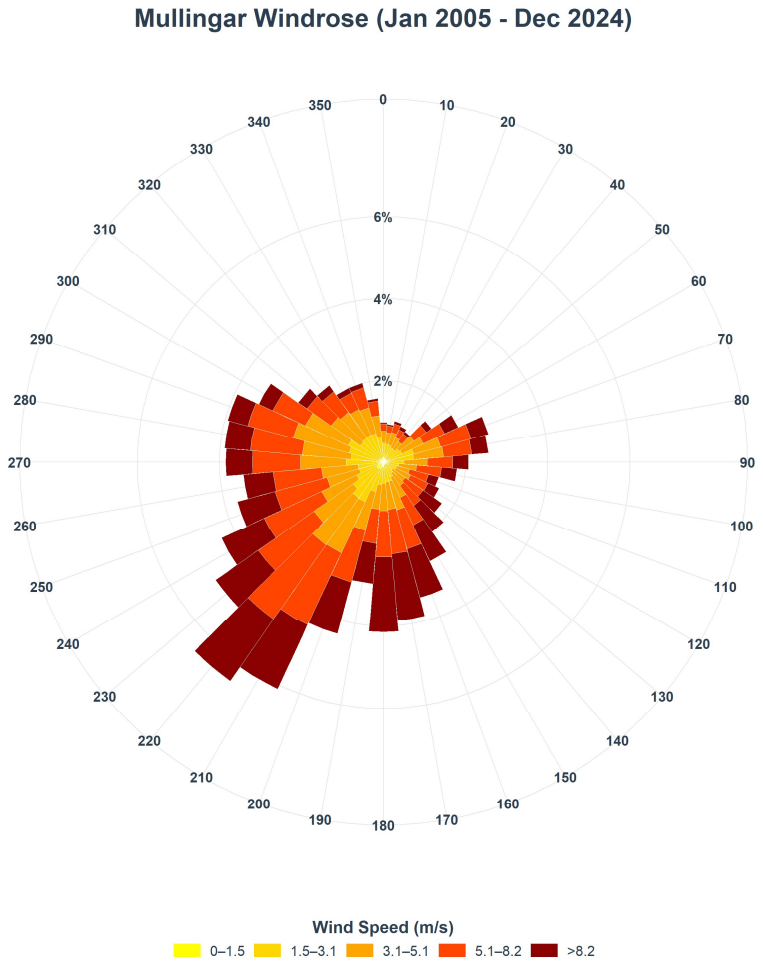
8.58 Rainfall is also an important climatological parameter in the generation of dust; enough rainfall can suppress dust at the source and eliminate the pathway to the receptor. According to Arup (1995)[5], rainfall greater than 0.2 mm per day is sufficient to suppress dust emissions.

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

Local Wind Speed and Direction Data

8.59 An appropriate weather station with sufficient records of wind direction and wind speed considered representative of typical conditions experienced at the application site is Mullingar Meteorological Station (c. 16km north). A wind rose for the average conditions recorded at Mullingar[6] over a 20-year period (2005-2024) is presented in **Plate 8-1**. The predominant wind direction is from the south-western quadrant.

Plate 8-1: Windrose for Mullingar Meteorology Station



Rainfall Data

8.60 Relevant rainfall data applicable to the site has been obtained from the Irish Meteorological Service website for the Mullingar station (2005 – 2024)[6]. The annual average days with

[6] Historical Data - Met Éireann - The Irish Meteorological Service

rainfall greater than 0.2 mm are 277 days per year. Natural dust suppression (from rainfall) is therefore considered to be effective for 76% 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 nearest designated sites include Raheenmore Bog SAC/pNHA (approx. 5.2 km to southwest); Milltownpass Bog NHA (8 km to north); Grand Canal pNHA (approx. 5 km southeast). These sites are located at a sufficient remove from the proposed development that potential noise impacts will be negligible.

8.63 Impacts on ecological receptors has therefore not been considered further in the assessment.

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, as illustrated in **Figure 8-1**. The closest receptor to the application site is the residential dwelling located c.150m to the southwest.

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 the DMRB guidance[7] 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 and human receptors 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
- a change in speed band; or
- a change in carriageway alignment by ≥ 5m.

[7] National Highways, 2020, Design Manual for Roads and Bridges

- Relevant screening for ecological receptors is:
    - A significant change in AADT flows (>5%)

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 / or receptors within 200m of affected roads would be assessed, where necessary. If a human / ecological receptor is located >200m from an affected road link, further consideration is not required.

8.72 The 200m 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[8] 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_{10}) 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[9]. 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_{10} 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

8 https://iaqm.co.uk/guidance/

9 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 8-7.**

Table 8-7: 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_{10})

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_{10} and to a lesser extent $PM_{2.5}$), which is associated with a range of health effects*".

8.85 The guidance further notes "*…the PM_{10} fraction is relevant to health outcomes. For quarries most of this suspended dust will be in the coarse sub-fraction ($PM_{2.5-10}$), rather than in the fine ($PM_{2.5}$) fraction.*" It is on this basis that only PM_{10} is considered further in this assessment.

8.86 With respect to PM_{10} and in accordance with the IAQM minerals guidance, if the existing annual mean background concentration of PM_{10} is less than 17µg/m^3, it is considered there is little risk of the impacts from the proposed development to cause an exceedance of the

annual mean AQAL. Where the background concentration is greater than 17µg/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 The site currently consists of poorly drained and open agricultural lands. There are no internal hedgerows, trees or structures within the proposed extraction area of c. 11.7 hectares.

8.88 The southern and western boundaries consist of an agricultural track and post/wire fencing. The eastern boundary consists of a mature hedgerow and a minor watercourse.

8.89 The northern application site boundary is denoted by a post/wire fence, with the Yellow river and the local access road c. 265m and c. 295m further to the north respectively. Between the northern boundary and the Yellow River is Turbine T7 associated with the Yellow River Windfarm development which has recently been constructed.Activities within the locale of the application site include the following (as illustrated in **Figure 8-1**):

- The existing Kilsaran Derrycoffey Sand and Gravel Pit development to the west which operates under multiple previous planning permissions, the most recent one being P. Ref 21/247 for a 23-year permission of a 44 hectare extension to the existing pit.
- The existing concrete batching facility operated by BD Flood Limited; of which permission was granted to Kilmurray Pre-Cast Concrete Ltd. In January 2014 (P. Ref 13/122).
- Skeagh Farms Piggery; the most recent permission P. Ref 13/251 is for a storage shed and ancillary structures on the existing pig farm. The existing pig farm operates under an integrated pollution prevent and control licence.
- the Oxigen Environmental Unlimited Company permitted (yet to be constructed) Materials Recycling Facility (MRF) (P. Ref 22/490)[10]; and
- The Yellow River Windfarm development recently constructed, for which turbines T1 – T7 are accessed off the local access road.

Proposed Site Operations

8.90 The proposed development is for the extraction of sand and gravel from an area of c. 11.7 ha within the application site. The extracted materials would be processed onsite into a range of aggregates that would primarily be transferred offsite for use in the applicant's existing concrete batching plant located c.600m to the northwest, and at other BD Flood sites. Processing on site would comprise mobile, screening and crushing plant that would be located within the active working area.

8.91 The proposed development would be operated between the hours of 0700 to 1800 Monday to Friday, and 0700 to 1400 on Saturdays. No extraction operations would be carried out outside of these times.

8.92 The proposed extraction and processing tasks and activities to be implemented at the site consist of the following:

- Removal of the in-situ clay soils/overburden overlying the sand and gravel.

[10] Case appealed (PL19.318566) and permission refused by An Coimisiún Pleanála. Included here as permission may be sought again in the future.

- Wet working extraction i.e. extraction of the sand and gravel materials from beneath the natural water table of the site to a depth of typically from 7m – 10m.
- Stockpiling of the sand and gravel adjacent to the working extraction area to allow drying of the materials.
- Processing of the aggregate through crushing and screening; and
- Stockpiling of the graded materials for the transportation off site to the existing adjacent concrete batching plant and other external BD Flood sites for use in the production of value-added concrete for the local and regional construction market.

8.93 The proposed extraction / restoration of the site is proposed on a phased basis. Working in this manner will facilitate the progressive restoration of each area which will generally comprise reinstatement of excavated silt and peat deposits to the extracted areas, the establishment of a permanent water body and allowing peat to naturally regenerate / revegetate over time. There is no requirement for importation of materials as part of the restoration proposals.

8.94 The proposed extraction development would be accessed along the northern application site boundary via an existing entrance onto the local access road, which provides the existing access from the R400 regional road (and M6 motorway) to the existing BD Flood concrete batching plant.

8.95 Sand and gravel would be extracted at a rate of 100,000 tonnes per annum; which would with the majority of the aggregates supplying the applicant's concrete batching plant, c. 600m to the northwest with the balance used in other BD Flood sites. Material would be transferred offsite using a fleet of 20-tonne capacity dump trucks. The traffic movements generated from the export of aggregate is calculated as 19 loads per day (38 movements); see **Chapter 14 Traffic** for further information.

Screening Assessment

8.96 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.

8.97 As illustrated in **Figure 8-1**, there are human receptors with a sensitivity to dust emissions within 250m of the application site. Further assessment for the potential impact of deposited and suspended dust on human receptors has therefore been undertaken.

8.98 There are no designated habitat sites within 250m of the site. Impacts on ecological receptors has therefore not been considered further in the assessment.

Deposited Dust Assessment

8.99 Two human receptors have been identified within the screening distance for consideration in the assessment of dust deposition. Receptors R1 and R2 are located c. 150m and 230m from the application site boundary, respectively, as illustrated in **Figure 8-1.** On account of both receptors being residential dwellings, they have been classified as being of high sensitivity to dust deposition.

8.100 The potential dust sources within 250m of the identified receptors and their potential for emission are considered below. From these, the determined residual source emissions (RSE) 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;
- Material handling;
- Mineral processing; and
- Material stockpiling.

Residual Source Emission (RSE) Magnitude

8.101 The residual source emissions (RSE) magnitude is the potential magnitude of dust emissions after embedded mitigation measures based on practices on other installations 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

8.102 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 vegetated screening berms as an additional dust screen;
- internal haulage routes, stockpiles and mobile crushing unit located greater than 150m from offsite receptors;
- internal haulage routes and mobile processing area would be a minimum of 150m from offsite receptors;
- additional perimeter vegetation planting along the western and southern site boundary during the operational phase and along the eastern site boundary as part of the mitigation phase; and
- the use of a water bowser to control dust emissions during dry weather periods.

Summary of Residual Source Emission (RSE) Magnitude

8.103 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 8-8**.

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

Activity	RSE	Factors / Designed in Measures (for activities <250m of receptors)
Site preparation / restoration	Small	Small, discrete working areas with progressive stripping / restoration Construction of perimeter screening berms using stripped soils / overburden Screening berms vegetated as soon as practicable and maintained as part of the restoration scheme

		135,000t of soil / overburden across the application site (smaller areas phased across the operational period) Stockpiles of soil / overburden – moderate to high dust potential during short term unvegetated period Tractor and water bowser for use during dry / windy weather conditions
Internal haulage	Small	Haulage requirements limited to short distances from working area / mobile plant area / graded stockpiling area adjacent to the mobile plant area. Low no. plant required (, 1x HGV for transport) Tractor and bowser for use during dry / windy weather conditions Unconsolidated haulage routes are greater than 150m from the nearest receptor
Excavation	Small	Low energy extraction methods – mechanical excavator Small working area (<5ha) Excavated material of low dust potential (excavated below water table, high moisture content) Tractor and water bowser for use during dry / windy weather conditions Maximum extraction rate of 100,000 tpa.
Material handling	Medium	Low no. heavy plant in daily operation (1 x Long Reach Excavator, 1x Loading Shovel, 1x HGV for transport, 1x Mobile Screening Plant). Unconsolidated surface Material of variable dust potential (mineral excavated wet, but allowed to dry out pre- and post- processing) Materials handled at various points, including stockpiling area, stockpiling area (pre-processed aggregate), plant area (processed aggregate), stockpiling area and loading area (processed aggregate) Tractor and water bowser for use during dry / windy weather conditions
Mineral processing	Medium	Raw material of low to moderate dust potential (allowed to dry prior to processing but would have an inherently high moisture content) End material of moderate to high dust potential Mobile plant (not fixed location) comprising crusher and screener (with water suppression as part of design)

		Low volume of material processed (100,000 tpa)
Mineral stockpiling	Medium	Short term stockpiles with frequent material transfers required All stockpiles located within pit working area limits pathway Stockpiles of raw mineral @ working area – low dust potential (high moisture content) Stockpiles of processed mineral – moderate to high dust potential All stockpiles of mineral >180m from offsite receptors

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

Summary of Pathway Effectiveness

8.105 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**.

8.106 A summary of the pathway effectiveness, in accordance with the IAQM methodology is provided in **Table 8-9**.

Table 8-9: Determination of Pathway Effectiveness

Receptor	Distance from Operations (m)	IAQM Distance Category	Wind Sectors Affecting Receptor	Frequency of Winds (%) >5m/s and Dry days	Frequency Category	Pathway Effectiveness
R1	150m	Intermediate	040 – 090 (Northeast-east)	9.5	Moderately Frequent	Ineffective
R2	230m	Distant	070 – 090 (East)	5.2	Moderately Frequent	Ineffective

Summary of Dust Effects and Significance

8.107 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 8-10**.

Table 8-10: 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
R2	Medium	Ineffective	Negligible	High	Negligible

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

8.109 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

8.110 As previously stated, the IAQM minerals guidance states that if the annual mean PM_{10} background concentration is less than 17µg/m³ 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.

8.111 The existing air quality, in terms of annual PM_{10}, has been taken from the background maps to represent conditions at the site. The maximum background PM_{10} concentration across the surrounding environment is 10-12 µg/m³, representing approximately 25–30 % of the corresponding AQAL for PM_{10} and well below the criteria of 17µg/m³.

8.112 It is therefore considered that in the absence of additional mitigation above the embedded measures stipulated in **Paragraph 8.101**, the effect of the proposed operations on human health as a result of emissions of suspended dust would be negligible.

Assessment of Impacts – Traffic Emissions

8.113 The site would export up to 100,000 tonnes of sand and gravel per annum, the majority of which would be exported to the applicant's concrete batching plant c. 600m to the north.

8.114 Based upon a fleet of 20-tonne capacity HDVs, the proposed development would generate an Annual Average Daily Traffic (AADT) of 33.4 movements per day. In accordance with **Chapter 14: Traffic** the distribution of the proposed development trips would be as shown in **Table 8-11** on the surrounding road links.

Table 8-11: Trip Generation (HDVs) (as AADT)

Road Link	% of Development Trips	AADT Movements
Local Road (west of site access)	70%	23.4
Local Road (east of site access)	30%	10
R400 Northbound[a]	23.9%	8
R400 Southbound[a]	5.80%	1.9
% Development trips are presented as an average between the outbound and inbound breakdowns, as presented in **Chapter 14: Traffic.**		

Table 8-12: Trip Generation (LDVs + HDVs) (as AADT)

Road Link	AADT Movements	Baseline AADT	Development Traffic as % of Baseline
Local Road (west of site access)	23.4	603	3.88%
Local Road (east of site access)	17.9	509	3.52%
R400 Northbound[a]	14.3	2,853	0.50%
R400 Southbound[a]	3.5	2,565	0.13%
% Development trips are presented as an average between the outbound and inbound breakdowns, as presented in **Chapter 14: Traffic.**			

8.115 The proposed trip generation with regards to both HDV movements and total movements as a percentage of the baseline are below the screening criteria for both human and ecological receptors.

8.116 Road traffic impacts can be considered as having a negligible impact and therefore a not significant effect. No further assessment is required.

Mitigation and Management

Unplanned Events (i.e., Accidents)

8.117 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.

8.118 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.

8.119 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_{10} concentration immediately surrounding the application site.

8.120 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, an alternative source in the form of a sub-contractor water-bowser will be brought to site.

Cumulative / Synergistic Impacts

8.121 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.

8.122 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.

8.123 The other sources of air emissions within 1km of the application site are limited to those that are long term operations, as noted in **Paragraph 8.99** above.

8.124 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.

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

Interaction with Other Impacts

8.126 The potential impact on air quality by the proposed development on sensitive receptors including sensitive ecological and human receptors has been fully assessed in this chapter.

Mitigation Measures

8.127 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 implementation during the proposed development.

8.128 **Table 8-8** presents a summary of both designed in measures and operational measures that together, summarise the operational controls that would be adhered to on a routine basis within both the application site. The implementation of such measures would ensure potential dust impacts remain 'not significant'.

Monitoring

8.129 Dust deposition monitoring should 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 guidelines) at the existing monitoring locations D1 to D3.

8.130 It is recommended that dust deposition monitoring should continue using the Bergerhoff Method at the existing monitoring locations D1-D3. Consideration should be given to the location of D3 and its proximity to forestry activities. Moving this monitoring location to the east would reduce the time spent downwind of the prevailing wind direction and the forestry site to the southwest which could reduce the amount of organic deposits collected, thereby providing a more representative measurement of dust deposition due to the application Site activities.

Residual Impact Assessment

8.131 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.

8.132 With the range of embedded measures to be incorporated into the working scheme and the adoption of the additional good practice mitigation measures, it is considered that the risk of air quality and dust related impacts at receptors generated by the proposed development will be 'negligible' and not significant.

Conclusion

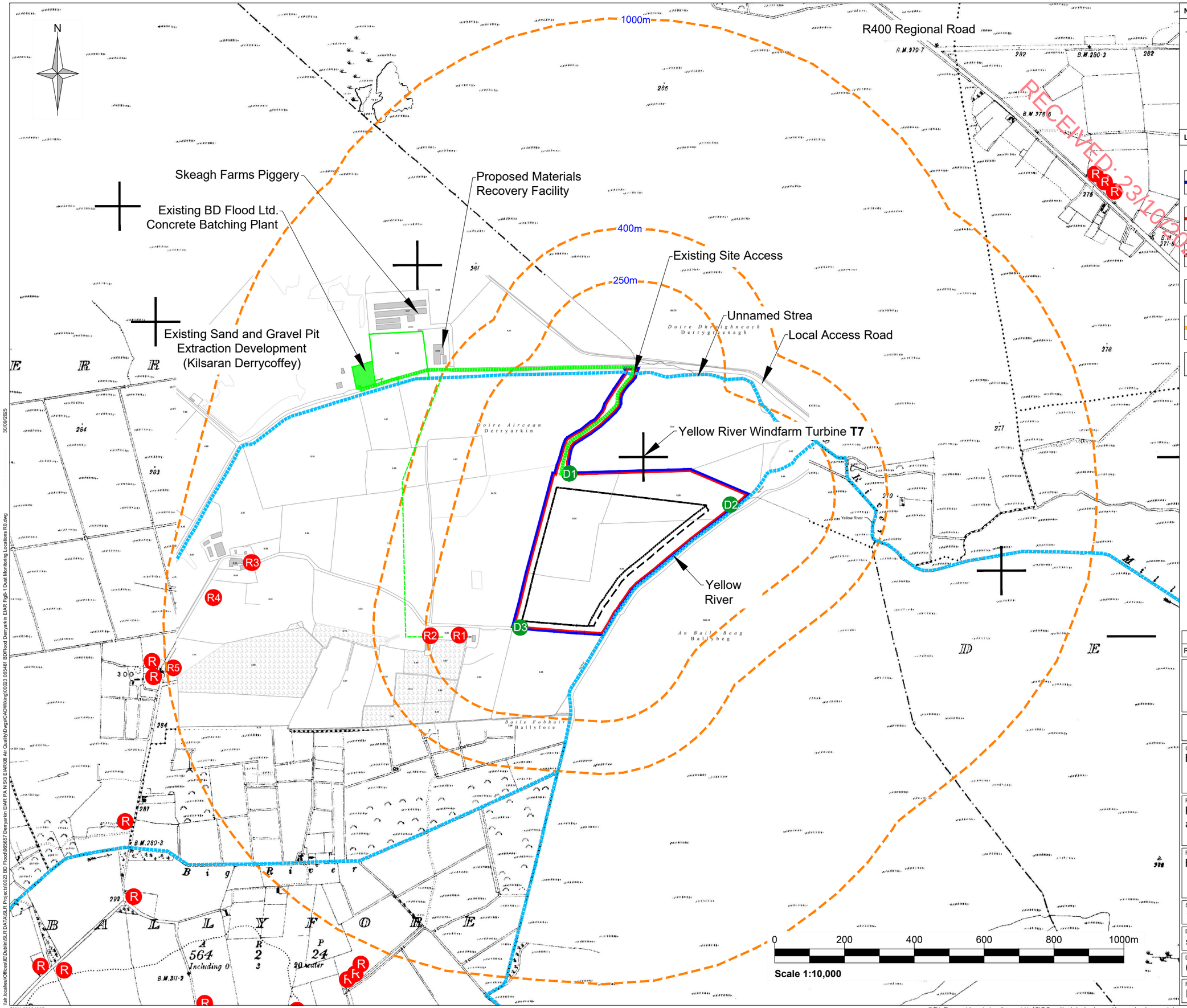
8.133 This assessment has considered the potential air quality effects arising from the proposed new sand and gravel extraction development at Derryarkin townland, Croghan, Rhode, Co. Offaly.

8.134 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'.

8.135 Following the 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 the proposed monitoring regime. A screening assessment of vehicle trip rates associated with the proposed development has been undertaken. The change in traffic movements is below the relevant screening criteria to require detailed assessment. As such, impacts on human and ecological receptors are considered to be 'not significant.

Figures

Figure 8-1 Site Setting, Receptor & Dust Monitor Locations



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Notes:

Tailte Éireann OSi Mapping 5,000 scale - sheet no.'s 3180 & 3181

Legend:

- Applicant Land Interest Boundary 19.5 hectares
- Proposed Planning Application Area 19.5 hectares
- Proposed Sand and Gravel Extraction Area 11.7 hectares
- D1 Baseline **Dust** Monitoring Locations
- Distance Off-Sets from Planning Application Boundary (red line) *250m, 400m and 1km*
- R2 Residential Property Locations *Residences numbered within 1km of Application Boundary*

Rev	Amendments	Date	By	Chk	Auth

SLR

www.slrconsulting.com

Client: BD Flood Unlimited Company

Project: Proposed Sand and Gravel Development at Derryarkin, Co. Offaly

Figure Title: Baseline Dust Monitoring Locations Map

Scale		SLR Project No.
1:10,000	@ A3	501.00023.065461

Designed	Drawn	Checked	Authorised
smcd	smcd	lh	lh
Date	Date	Date	Date
01/25	01/25	09/25	09/25

Figure Number: **Figure 8-1** Rev.: **0**

30/09/2025

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