January 2025

Environmental Impact Assessment Report (EIAR) - Volume 2

Proposed Quarry Re-Commencement and Extension

Herbie Stephenson Limited

Deerpark, Donard, Co. Wicklow

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Form ES - 04

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Environmental Impact Assessment Report (EIAR) - Volume 2

Proposed Quarry Re-Commencement and Extension

Herbie Stephenson Limited

Deerpark, Donard, Co. Wicklow

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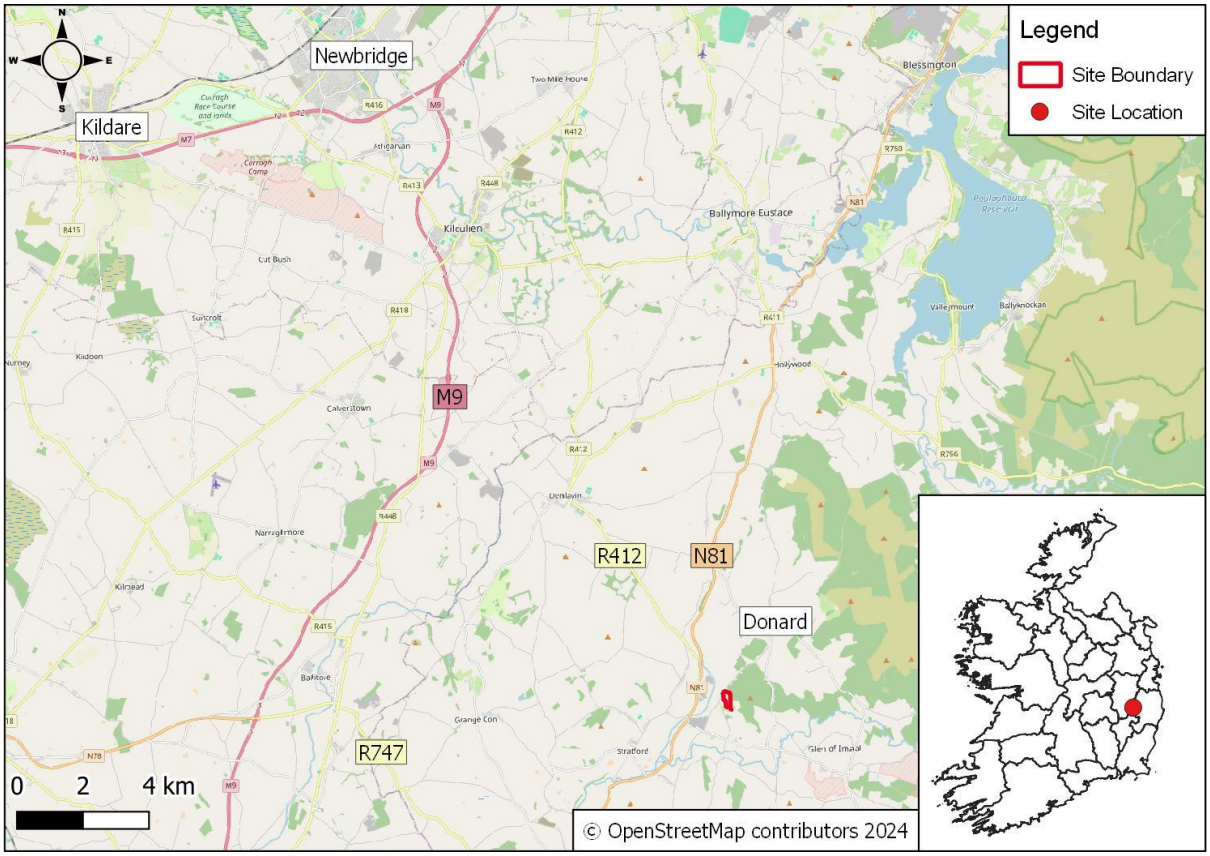
1 GENERAL

Malone O'Regan Environmental ('MOR Environmental') was commissioned by Herbie Stephenson Limited ('the Applicant') to prepare an Environmental Impact Assessment Report ('EIAR') in support of a planning application to Wicklow County Council ('WCC') for the proposed re-commencement of quarrying at an old rock quarry in Deerpark, Donard, Co. Wicklow, to a level of 165 metres above Ordnance Datum ('mAOD'), along with the extension of the quarry into reserves to the south and east of the old quarry (the 'Proposed Development').

1.1 Introduction

The Proposed Development will be located on a site covering an area of circa ('ca.') 8.1 hectares ('ha') within the townland of Deerpark and Donaghmore Co Wicklow (Ordnance Survey Ireland Grid Reference ITM 692022, 695358). Refer to the redline boundary presented in Figure 1-1 below for context ('the Site'). The Site is located ca. 2.4km southwest of Donard.

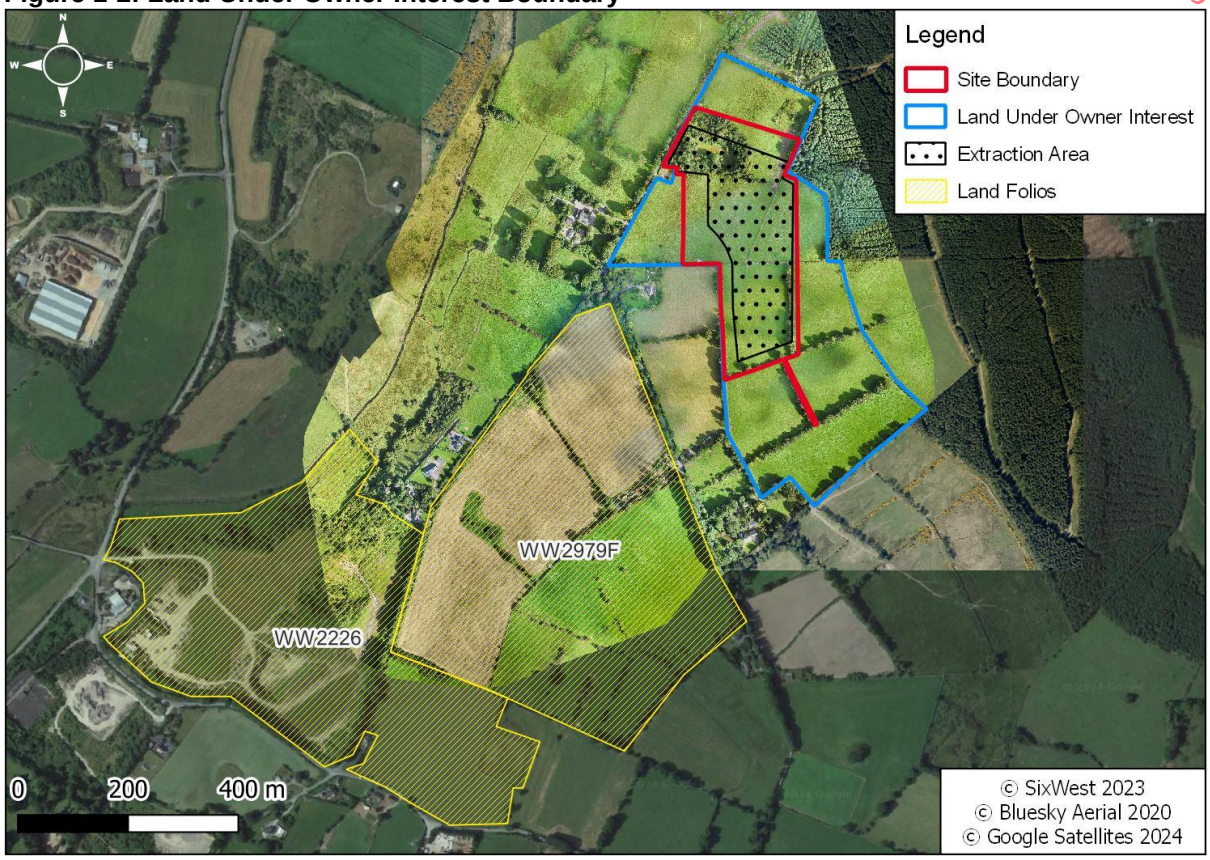
Figure 1-1: Site Location



1.2 Site Description and Layout

The land under owner interest is shown below in Figure 1-2 below and covers an area of ca. 20.5ha. The Site boundary is ca. 8.1ha in size, with an extraction area of ca. 5.01ha. The lands to the south are also under the ownership of the Applicants family including land folio WW2979F and WW2226 adjoining the local road to the south and southwest; refer to Figure 1-2.

Figure 1-2: Land Under Owner Interest Boundary



The Site was a pre-1963 quarry development that sought and was granted planning in 1991 on ca. 2.5ha (Planning Ref. 90/006374) for a period of five years. Operations ceased following the expiry of the planning permission. The quarry was registered under S261 of the Planning and Development Act as QY/28 in Wicklow and identified as a basalt rock quarry.

Planning was sought to re-open the quarry in 2021 (Planning Ref. 21/1472) with a site area of ca. 2.4ha and a pit floor of 165mAOD. The application was refused by the Local Authority on the grounds that a sub-threshold EIAR and a Stage 2 Natura Impact Statement ('NIS') should have been supplied as part of the planning application.

Planning was sought to re-open the quarry in May 2024, with a site area of ca. 10ha, which included an EIAR and NIS, which was refused on 5 grounds on 23rd July 2024, including the visibility of the Site, concerns on sightlines at the existing entrance, outline works required on the L4320 local road, risks of noise on archaeological sites and the understood assessment of the overall restoration plan objectives within the EIAR and NIS.

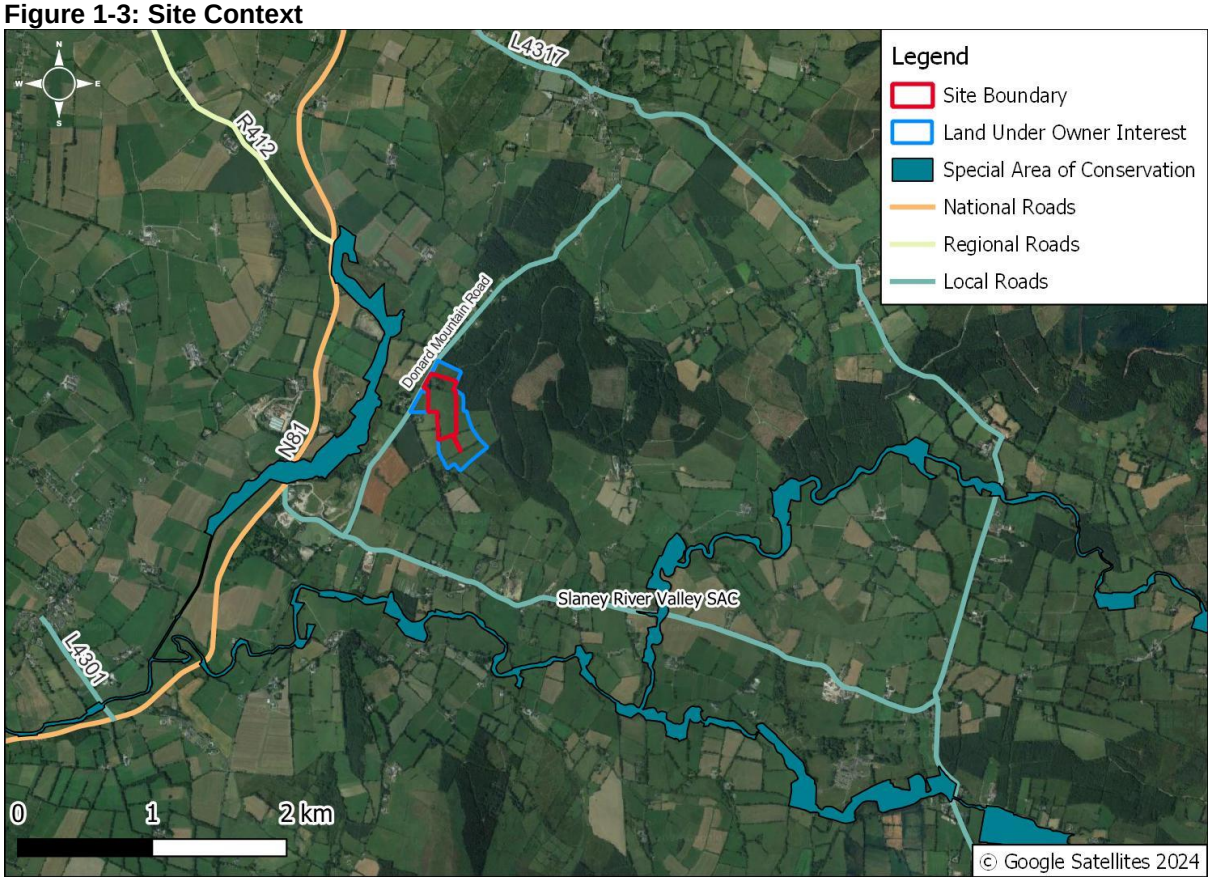
The Site comprises the old quarry and the proposed extension lands, primarily to the south and southeast. The proposed extension lands comprise of areas of scrub and improved agricultural grassland. This is a greenfield area with no history of planning applications on the WCC planning portal [1]. The northern area of the Site is located within the old quarry. This area has been completely stripped of overburden. To date, quarrying activities within this area have extracted material to a depth of ca. 173mAOD. The entrance to the old quarry, located adjacent to the local road (the L-4320), lies at a level with the road at ca. 166-167mAOD.

1.3 Description of the Setting of the Proposed Development

The Site is located outside the Local Area Plan for Donard Town; therefore, no specific zoning is identified for the Site.

The Site is located within an agricultural area. The lands to the north and east of the Site contain commercial coniferous woodland plantations and scrub habitat bound by agricultural fields in the form of pastures. The lands to the west of the Site consist of agricultural pastures, one-off residential dwellings and the L-4320 (the Donard Mountain Road). The Slaney River Valley Special Area of Conservation ('SAC') is located ca. 328m west of the Site. The closest Special Protection Area ('SPA') is the Wicklow Mountains SPA, which is located to the east of the Site and lies 6km from the Site at the closest point. Refer to Figure 1-3 below for context.

Figure 1-3: Site Context



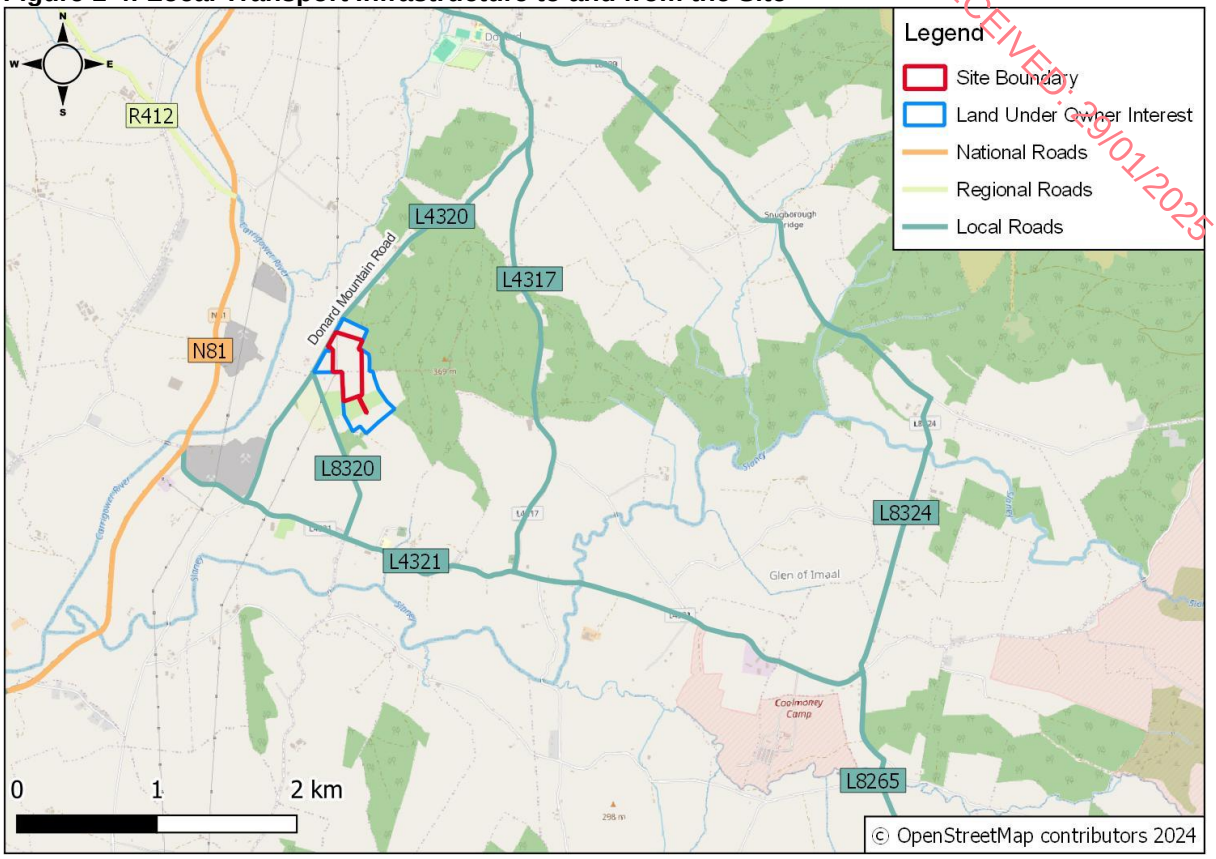
1.4 Description of Local Road Infrastructure

The N81 runs from Baltinglass northeast to Hollywood ca. 700m east of the Site. The L4321 leaves the N81 ca. 8.2km north of Baltinglass and runs eastward to a crossroads with Donard Mountain Road, which runs between Kill Crossroads to the south and the L4317 to the north. Donard Mountain Road (L4320) forms the northwestern boundary of the Site. The eastern extreme of the L4321 connects to the L8324/L8265. Refer to Figure 1-4 below for context.

Donard Mountain Road can also be accessed from the L8320, which runs from the south of the Castleruddery Crossroads to the junction with Donard Mountain Road just to the south of the Site.

The Site is located ca. 2km south of Donard town via Donard Mountain Road and the L4317. Therefore, the Site is centrally positioned within the wider N81 corridor. Refer to Figure 1-4 below for context.

Figure 1-4: Local Transport Infrastructure to and from the Site



1.5 Notable Developments in the Area

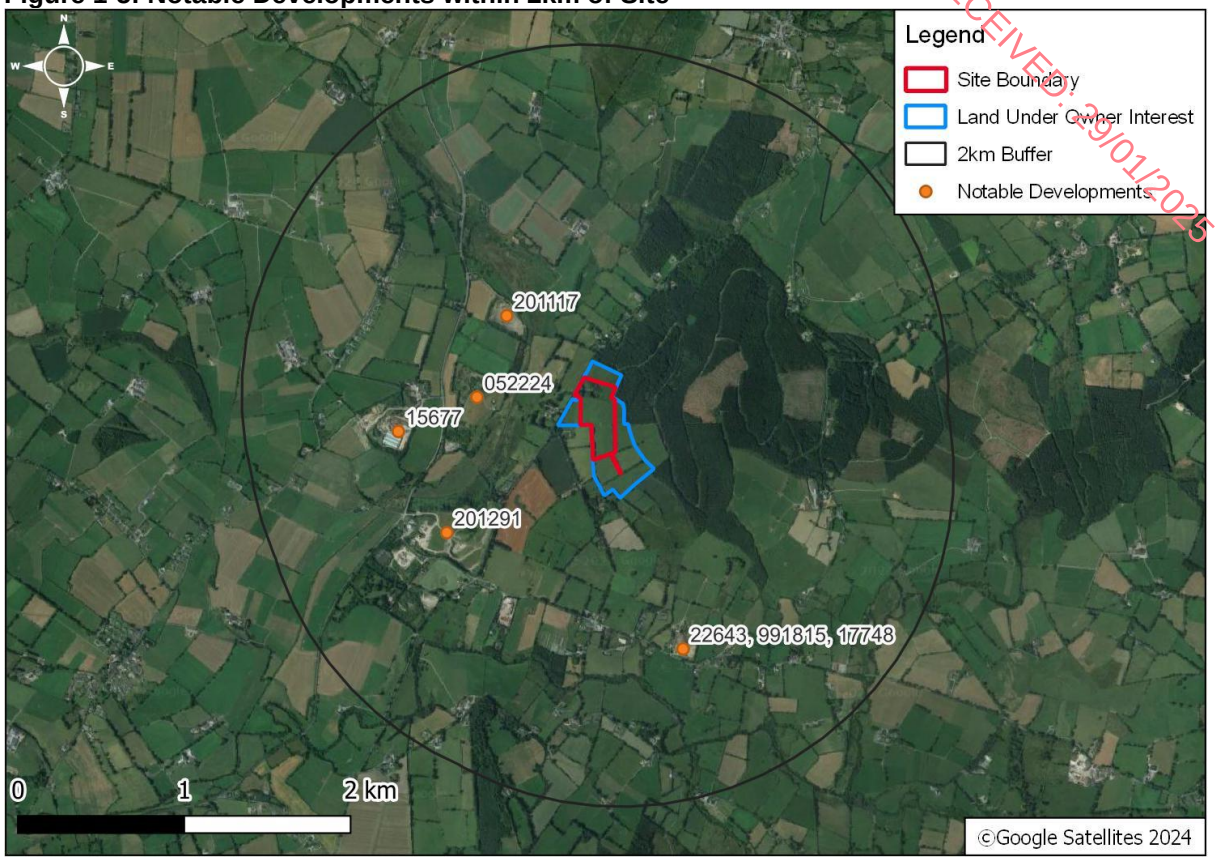
Notable developments were considered to be existing or proposed developments in the area that have the potential to interact with the Proposed Development and lead to potential in-combination effects.

A review of developments within 2km of the Site has been undertaken, utilising the:

- WCC Planning Portal [1];
- Environmental Impact Assessment ('EIA') portal [2];
- An Bord Pleanála ('ABP') Portal [3];
- Aerial imagery from Google Earth [4] ; and,
- Wicklow County Development Plan 2022-2028 ('CDP') [5].

The majority of proposed and existing developments within the 2km study of the Site are residential dwellings. There are five large-scale developments identified within the study area identified; refer to Figure 1-5 below. These are discussed further in Chapter 2.

Figure 1-5: Notable Developments within 2km of Site



1.6 Applicant

The Applicant, Herbie Stephenson Ltd, was created in 2020 to operate within the haulage of aggregates to the construction sector and to amalgamate the business operations of the company principal, Mr Stephenson.

Mr Stephenson has worked in the extractive industry since 2003. He expanded into site clearance / construction and demolition. Prior to the creation of Herbie Stephenson Ltd and having gained significant management experience in Construction & Demolition ('C&D') wastes, Mr Stephenson began operating a large number of permitted waste collection vehicles under a countrywide waste collection permit. Mr Stephenson also established a permitted waste facility dealing with the intake of soil and stone. In 2019, Herbie was the project manager in the formation of a concrete recycling centre. At present, the Applicant has 15 employees and is recruiting.

1.7 Scope of the Proposed Development

The Applicant proposes to re-commission the existing old quarry and extend into land in the east and south. The Proposed Development seeks to extract to a level of 165mAOD. The Proposed Development also includes required facilities such as canteen, office and washroom facilities, which will be constructed within the footprint of the old quarry. Additionally, all related ancillary works i.e. provision of screening berms, tree planting and landscape works along the perimeter of the Site and the provision of final restoration works to include the extension area (see Figure 1-6 below). The area breakdown of the Proposed Development is outlined below:

- Old quarry area encompassing additional facilities ca. 2ha;
- Ancillary works along the Site boundary ca. 4ha;
- Overall, three-phase extraction area ca. 5.01ha; and,
- Total Site boundary area ca. 8.1ha.

The Proposed Development will have 3 distinct stages per Phase:

- Stage I: Removal of topsoil and overburden;
- Stage II: Aggregate Extraction (blasting), Processing, Stockpiling & Haulage to Market; and,
- Stage III: Restoration.

The Proposed Development will extract the Site to a depth of ca. 165mAOD, one bench below the existing ground level within the old quarry floor, to obtain usable aggregate material. The Site has an estimated reserve of ca. 1,283,500m^3 or 3,080,400 tonnes of aggregates. It is proposed to extract up to a maximum permitted output of 200,000 tonnes of aggregates per annum ('tpa') on average, giving a life span of operations within the extension of ca. 15.5 years.

It would be unrealistic to assume that the quarry will sustain peak production levels due to unknown future market requirements. It is estimated that the Proposed Development area would be exhausted within ca. 16 - 22 years; therefore, planning permission is being sought for 25 years, due to the longer extraction period.

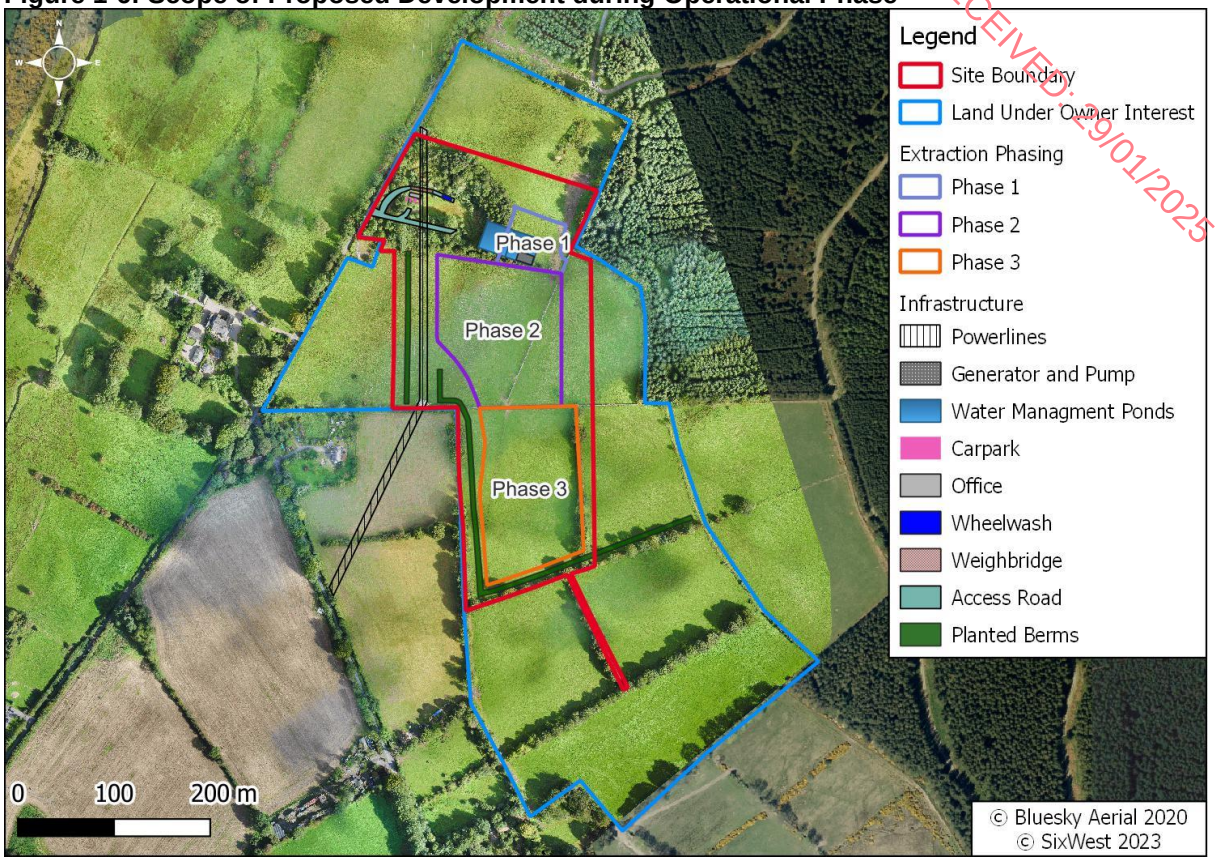
The EIAR for the Site will assess the potential impacts of the following:

- Construction Phase (up to 12 months);
- Extraction working life (16 - 22 years of operation); and,
- Rehabilitation of the Site (two years).

Following the cessation of activities within the Site, a rehabilitation plan will be implemented. Therefore, a Restoration Plan is submitted as part of this application (attached as Appendix 6-1). The Restoration Plan approach will ensure vegetation becomes established during the operational phase of the quarry, thereby reducing the overall impact (i.e. dust, visual, flora and fauna).

The restoration of the Site will develop on the proposed landscaping works, providing for the additional embankment / berms, tree and scrub planting and the provision of future habitats for both flora and fauna species. Details of the plan are in Chapter 3, Section 3.3.3 below. The overall layout of the Proposed Development during its operational phases is shown in Figure 1-6 below.

Figure 1-6: Scope of Proposed Development during Operational Phase



1.8 The Environmental Impact Assessment Report ('EIAR')

This EIAR has been prepared in accordance with the requirements of the following legislation:

- The Planning and Development Act, 2000, as amended;
- Part II of the first Schedule of the European Communities (Environmental Impact Assessment ('EIA')) (Amendment) Regulations, 1999 (S.I. No. 93 of 1999);
- The Local Government Planning and Development Regulations 2001, as amended (S.I. No. 600 of 2001 and subsequent amending legislation); and,
- European Union ('EU') (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No.296 of 2018).

The following existing and draft guidance were considered in preparing this EIAR:

- Environmental Protection Agency ('EPA') Advice notes on current practice in the preparation of Environmental Impact Statements, 2003 [6];
- EPA Guidelines on the information to be contained in Environmental Impact Statements, 2002 [7];
- European Commission: Interpretation of definitions of project categories of Annex I and II of the EIA Directive, 2015 [8];
- European Commission: Guidance on the preparation of the Environmental Impact Assessment Report, 2017 [9];
- EPA: Guidelines on the Information to be contained in Environmental Impact Assessment Reports, 2022 [10];

- Department of Housing, Planning and Local Government ('DeHPLG'): Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment, 2017 [11];
- Department of Environment Heritage and Local Government ('DeEHLG'): Quarries and Ancillary Activities: Guidelines for Planning Authorities, 2004 [12];
- Department of Arts, Heritage and the Gaeltacht ('DeAHG'): Wildlife, Habitats & the Extractive Industry. Dublin, 2007 [13];
- Department of Housing, Planning, Community and Local Government ('DeHPCLG'): Implementation of Directive 2014/52/EU on the effects of certain public and private projects on the environment (EIA Directive) Circular Letter 1/2017, (May 2017) [14]; and,
- DeHPCLG: Transposition of 2014 EIA Directive (2014/52/EU) in the Land-Use Planning and EPA Licencing Systems Key Issues Consultation Paper (May 2017) [15].

1.8.1 EIA Amending Directive (2014/52/EU)

On 14th April 2014, the EIA Directive (2014/52/EU) ('the EIA Amendment Directive') was adopted by the Council of the EU and amended Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment. Article 2 of the EIA Amendment Directive required all Member States to bring the Directive into force by 16th May 2017.

The EIA Amendment Directive clarified aspects of the preceding Directive 2011/92/EU to bring it into line with intervening European Court of Justice ('ECJ') judgments and introduced additional provisions and procedural options. Therefore, compliance with the EIA Amendment Directive (2014/52/EU) will automatically ensure compliance with Directive 2011/92/EU. In Ireland, the EU (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. 296 of 2018) came into effect on the 1st September 2018 and gave effect to Directive 2011/92/EU as amended by the EIA Amendment Directive.

Article 1 (2)(g) of the Amending EIA Directive provides that an EIA means a process consisting of:

1. The preparation of an environmental impact assessment report by the developer;
2. The carrying out of a consultation;
3. The examination by the competent authority of the information presented in the environmental impact assessment report and any supplementary information provided, where necessary, by the developer and any relevant information received through consultation;
4. The reasoned conclusion by the competent authority on the significant effects of the project on the environment, taking into account the results of the examination referred to in point (c) and, where appropriate, its own supplementary examination; and,
5. The integration of the competent authority's reasoned conclusion into its decision.

An EIAR document is produced as a key component of the EIA process. It provides a description of:

- The baseline environment;
- Identification of the potential effects (if any – both positive and negative) that are predicted to be incurred as a result of the Proposed Development;
- A description of any control and mitigation measures required to avoid, reduce or eliminate such potential effects; and,

- A description of the reasonable alternatives studied by the persons who prepared the EIAR, which are relevant to the Proposed Development and its specific characteristics.

1.8.2 Assessment under Schedule 5 (Mandatory EIA)

The relevant classes of developments that require EIA are set out in Schedule 5 of the Planning and Development Regulations 2001 (as amended). Schedule 5 transposes Annex I and Annex II of the EU EIA Directive (85/337/ECC as amended) into Irish law under Parts 1 and 2 of the Schedule. There are no new criteria under S.I. No. 296 of 2018.

The Proposed Development is for the re-commencement of the extension of extraction activities into the Site.

Part 1 – Item 19:

Quarries and open-cast mining where the surface of the site exceeds 25 hectares.

Part 2 – Item 2(b):

Extraction of stone, gravel, sand or clay, where the area of extraction would be greater than 5 hectares.

Part 2 – Item 13 (a):

Any change or extension of development already authorised, executed or in the process of being executed (not being a change or extension refer to in Part 1) which would:

i. Result in the development being of a class listed in Part 1 or paragraphs 1 to 12 of Part of this Schedule; and,

ii. Result in an increase in size greater than 25 per cent, or an amount equal to 50 per cent of the appropriate threshold, whichever is greater.

The old quarry site covers an area of ca. 2.5 ha. However, with the addition of the proposed extension lands and the land under owner interest, the quarry will be greater than 5 ha. As such, the Proposed Development triggers the requirement for mandatory EIA (Part 2 Item 2(b)) and this EIAR has been prepared for inclusion with the planning application to the competent authority.

1.8.3 Scope of the EIAR

In accordance with the EPA Guidelines [16] the following attributes of the receiving environment and their interactions are described within this EIAR:

- Population and Human Health;
- Biodiversity;
- Land, Soils and Geology;
- Water (Hydrogeology and Hydrology);
- Air Quality;
- Climate;
- Acoustics (Noise and Vibration);
- Landscape and Visual;
- Cultural Heritage (Archaeology); and,
- Material Assets – Traffic and Transport.

1.8.4 Structure of the EIAR

Table 1-1 provides a description of the EIAR structure.

Table 1-1: Structure and Description of the EIAR

Title	Description
Volume 1: Non-Technical Summary ('NTS')	
NTS	The NTS contains an overview of the Proposed Development and the principal findings of the Environmental Impact Assessment ('EIA') in non-technical language.
Volume 2: Main EIAR Report	
Chapters 1-4	Chapters 1-4 introduce the Proposed Development, describes the Proposed Development, the need for the Proposed Development and the alternatives considered.
Chapters 5-14	Chapters 5-14 comprise of the assessment of predicted environmental effects together with an evaluation of their significance and a description of any mitigation measures proposed to minimise effects. These chapters also consider the interactions between the various environmental topics. Chapters 5-14 generally follow the structure set out below: • A brief introduction to the chapter; • An outline of the methodology employed; • A description of the existing receiving environment ('baseline') relevant to the environmental topic under consideration; • A description of the characteristics and predicted effects of the Proposed Development on the receiving environment, including a description of cumulative effects where relevant; • A description of the reductive or mitigation measures and/or the factors that will reduce or eliminate any significant environmental effects identified; • A description of the residual effect of the Proposed Development. Residual effects are the remaining effects that will occur after the proposed mitigation measures have been taken into consideration; • A description of the interactions with other environmental attributes; • Details of any monitoring required during Site preparation and operations; • Details of any rehabilitation required; and, • Difficulties encountered in undertaking the assessment.
Chapter 15	Chapter 15 provides an overview of the major interactions between the environmental impact topics assessed within Chapters 5-14.
Chapter 16	Chapter 16 outlines the overall Schedule of Commitments agreed by the applicant in the event that the planning application is authorised.
Drawings	A3 Drawings of the Proposed Development including: • Site location map; • Site Layout Map; and, • Cross Sections of the Proposed Development.
Volume 3: Appendices	

Title	Description
Appendix	Relevant topic-specific technical documentation supporting the EIAR are contained within appendices that are presented as a separate Volume of the EIAR (Volume 3).

1.9 Methodology

The assessment of effects has been undertaken in accordance with best practice, legislation and guidance notes, as listed in Section 1.8. The evaluation of significance considers the magnitude of the change and the sensitivity of the resource or receptor. Unless otherwise stated, this approach has been adopted throughout the EIAR.

1.9.1 Assessment of Effects – Evaluation Criteria

The criteria for determining the significance of impacts and the effects are set out in Figure 1-7 below, taken from EPA Guidance [16]. Definitions of effect, as outlined by the EPA, are included in Table 1-2 to Table 1-7 below. These definitions are used throughout the EIAR. Certain chapters may use additional or alternative terms due to the specific methodology or guidance required within those chapters. Such alternative uses will be stated within the chapter.

Figure 1-7: Description of the Environmental Impacts

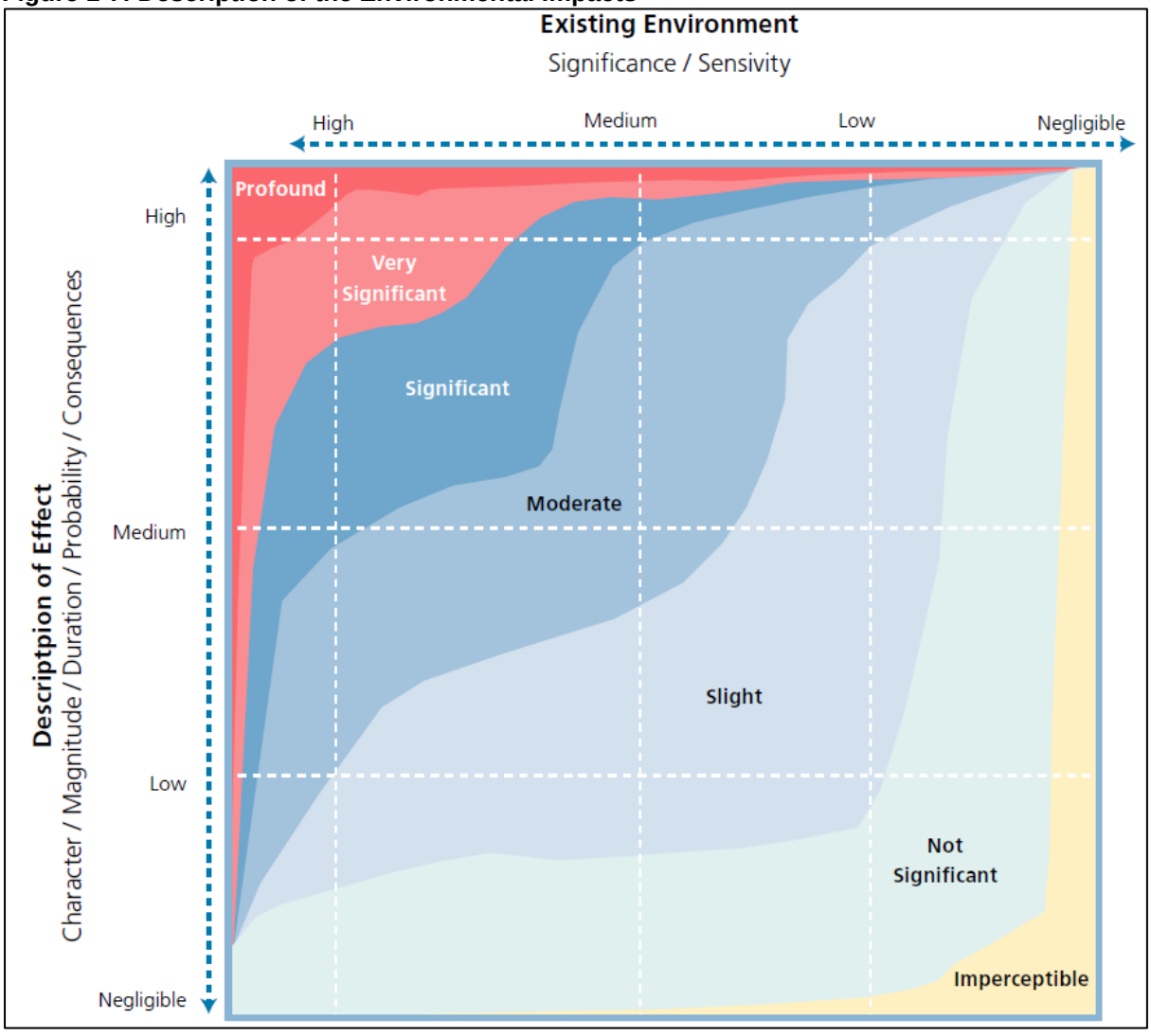


Table 1-2 defines the quality of effect from a planned project on the environment ranging from positive to negative.

Table 1-2: Quality of Effect

Type of Effect	Quality of Effect
Positive Effects	A change which improves the quality of the environment (for example, by increasing species diversity, or improving the reproductive capacity of an ecosystem, or improving the reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
Neutral Effects	No effects or effects that are imperceptible within normal bounds of variation or within the margin of forecasting error.
Negative / Adverse Effects	A change which reduces the quality of the environment (for example lessening species diversity or diminishing the reproductive capacity of an ecosystem, or damaging health or property by causing nuisance).

Table 1-3 outlines the definitions of significance of effect from a planned project on the environment ranging from imperceptible to profound.

Table 1-3: Definitions of Significance of Effect

Classification	Criteria
Imperceptible	An effect capable of measurement but without noticeable consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without noticeable consequences.
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effects	An effect which alters the character of the environment in a manner that is consistent with existing and emerging trends.
Significant Effects	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the environment.
Profound Effects	An effect which destroys sensitive characteristics.

Table 1-4 describes the terminology used to discuss the extent and context of an effect from a planned project on the environment.

Table 1-4: Describing the Extent and Context of Effects

Magnitude	Description
Extent	Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.
Context	Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?).

Table 1-5 describes the probability of an effect from a planned project.

Table 1-5: Describing Probability of Effect

Magnitude	Description
Likely Effects	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.

Tables 1-6 discuss the duration and frequency of the effects of a planned project. Momentary effects lasting from seconds to minutes will often be less concerning than a long-term or permanent effect, depending on the severity.

Table 1-6: Describing Duration and Frequency of Effects

Magnitude	Description
Momentary Effects	Effects lasting from seconds to minutes.
Brief Effects	Effects lasting less than a day (<1 day).
Temporary Effects	Effects lasting less than a year (<1 year).
Short-term Effects	Effects lasting one to seven years (1-7 years).
Medium-term Effects	Effects lasting seven to fifteen years (7-15 years).
Long-term Effects	Effects lasting fifteen to sixty years (15-60 years).
Permanent Effects	Effects lasting over sixty years (>60 years).
Reversible Effects	Effects that can be undone, for example through remediation or restoration.
Frequency of Effects	Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).

Table 1-7 defines the types of effects that can potentially occur as a result of a planned project.

Table 1-7: Describing Types of Effects

Magnitude	Description
Indirect Effects (a.k.a. Secondary Effects)	Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
Cumulative Effects	The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.
Do Nothing Effects	The environment as it would be in the future should the subject project not be carried out.
`Worst case' Effects	The effects arising from a project in the case where mitigation measures substantially fail.
Indeterminable Effects	When the full consequences of a change in the environment cannot be described.
Irreversible Effects	When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.

Magnitude	Description
Indirect Effects (a.k.a. Secondary Effects)	Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
Residual Effects	The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
Synergistic Effects	Where the resultant effect is of greater significance than the sum of its constituents (e.g. combination of SO_x and NO_x to produce smog).

The above terminology will be used throughout this report unless superseded by an environmental topic best practice in assessing EIA. Where specialist topics defer from these terms, a topic-specific methodology will be provided for within the relevant chapter.

1.9.2 Assessment of Cumulative Impacts

Cumulative effects have been considered within the EIAR under each relevant environmental topic in Chapters 5-15. This assessment considers Annex IV(5) subsection (e)23 of the EIA Directive, as amended, states that an EIAR should contain:

> *"A description of the likely significant effects of the project on the environment resulting from, inter alia:*
>
> *e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources."*

Annex IV(5) also states:

> *"The description of the likely significant effects on the [environmental] factors should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the project."*

1.10 Non-Statutory Consultation

In accordance with best practice guidelines [16], this EIAR included non-statutory consultation issued on the 30th January 2023. It is important to note that this consultation was carried out in relation to the previous application submitted under planning reference 24/60294.

Submissions made, and the information supplied under the Planners Report associated with planning file 24/60294 has been taken and incorporated into the designs of this Proposed Development. The concerns raised in these submissions, as well as the five grounds for refusal by the Planning Authority, have been thoroughly addressed through modifications to the original project design.

Table 1-8 below lists the consultees notified about the Proposed Development, whether a response was received, and the topics of interest raised by the consultee, where relevant.

Table 1-8: Consultation and Consultee Responses

Consultee	Date of Responses	Method of Responses	Topics Raised	Relevant Chapter
An Taisce	N/A	N/A	N/A	N/A
Wicklow County Council	N/A	N/A	N/A	N/A
BirdWatch Ireland	N/A	N/A	N/A	N/A
Friends of the Irish Environment	N/A	N/A	N/A	N/A
Fáilte Ireland	N/A	N/A	N/A	N/A

Consultee	Date of Responses	Method of Responses	Topics Raised	Relevant Chapter
Irish Wildlife Trust	N/A	N/A	N/A	N/A
Electricity Supply Board ('ESB')	N/A	N/A	N/A	N/A
Gas Networks Ireland ('GNI')	N/A	N/A	N/A	N/A
Department of Agriculture, Food and the Marine ('DAFM')	N/A	N/A	N/A	N/A
Department of Business, Enterprise and Innovation ('DBEI')	N/A	N/A	N/A	N/A
Department of Communications, Climate Action and Environment ('DCCAE')	N/A	N/A	N/A	N/A
Department of Culture, Heritage and the Gaeltacht ('DCHG')	N/A	N/A	N/A	N/A
Department of Rural and Community Development ('DRCD')	N/A	N/A	N/A	N/A
Department of Transport, Tourism and Sport ('DTTS')	N/A	N/A	N/A	N/A
Development Applications Unit – National Parks and Wildlife Service ('NPWS')	N/A	N/A	N/A	N/A
National Monuments Service	N/A	N/A	N/A	N/A
Environmental Protection Agency ('EPA')	N/A	N/A	N/A	N/A
Geological Survey of Ireland ('GSI')	N/A	N/A	N/A	N/A
The Heritage Council	N/A	N/A	N/A	N/A
Office of Public Works ('OPW')	N/A	N/A	N/A	N/A
Sustainable Energy Authority of Ireland ('SEAI')	N/A	N/A	N/A	N/A
Teagasc	N/A	N/A	N/A	N/A
Eastern-Midlands Waste Management Office	N/A	N/A	N/A	N/A

Consultee	Date of Responses	Method of Responses	Topics Raised	Relevant Chapter
Health Service Executive ('HSE')	08/03/2024	Letter	Consultation acknowledgement received. The consultee has raised the assessment of impacts arising from the Proposed Development in relation to water, land, soils and geology, air quality, climate change and Opportunity for Health Gain, noise and vibration and waste management as topics for attention. Additionally, the consultee has recommended that public consultation is undertaken, decommissioning / restoration is considered, and an environmental management system is put in place.	The topics raised by HSE are addressed in Chapters 3, 5, 7, 8, 9, 10 and 11, of the EIAR.
Health Service Executive ('HSE')	12/03/2024	Letter	Consultation acknowledgement received. The consultee has raised the assessment of impacts arising from the Proposed Development in relation to water, land, soils and geology, air quality, climate change and Opportunity for Health Gain, noise and vibration, ancillary Facilities and waste management as topics for attention. Additionally, the consultee has recommended that public consultation is undertaken, decommissioning / restoration is considered, and an environmental management system is put in place.	The topics raised by HSE are addressed in Chapters 3, 5, 7, 8, 9, 10 and 11, of the EIAR.
Inland Fisheries Ireland	15/02/2024	Email (letter attached)	Consultation acknowledgement received. The consultee directs attention to the Carrigower River and The Slaney River as important as Special Area for Conservation. The consultee raises the assessment of suspended solids associated with road run-off on the local road network due to traffic generated by the Proposed Development.	The topic raised by the consultee are addressed in Chapters 6 and 13.
Department of Housing, Local Government and Heritage	05/03/2024	Email (letter attached)	Consultation acknowledgement received. The consultee has raised the assessment of archaeology and stated the need for appropriate mitigation measures where appropriate.	The topic raised by the Department are addressed in Chapter 13.

Consultee	Date of Responses	Method of Responses	Topics Raised	Relevant Chapter
Uisce Éireann	25/02/2024 and 08/03/2024	Email (letter attached)	Consultation acknowledgement received. The consultee raised the assessment of potential impact from backfill materials and to surface waters, groundwater and drinking water supplies and stated the need for appropriate mitigation measures as required.	The topics raised by Irish Water are addressed in Chapters 7 and 8.
Transport Infrastructure Ireland ('TII')	08/02/2024	Email (letter attached)	Consultation acknowledgement received. The consultee has raised the assessment of impacts on the national road infrastructure and has requested that consultation take place with the local authority in relation to existing and future road schemes; The consultee has also specified the need for an assessment of noise. In addition, the consultee requests a Traffic and Transport Assessment, if it is deemed appropriate. Finally, the consultee has requested the identification of appropriate haul roads that can properly serve the material being exported from the Site.	The topics raised by TII are addressed in Chapters 9,10,11 and 14.

A copy of the consultation letter that was issued is presented in Appendix 1-1. Copies of the submissions received from the Consultees are presented in Appendix 1-2.

1.11 Assessment of the Risk of Accidents and Unplanned Events

In accordance with EPA guidance [16] the risk of accidents and unplanned events which may be either caused by or have an impact on the Site, have been assessed in all relevant specialist chapters of this EIAR. A risk-based approach was employed for these assessments, as recommended in the EPA guidance.

1.12 Project Team

The in-house MOR Environmental project team included the following:

Table 1-9: MOR Environmental In-House Project Team

Chapter(s)	Name	Role	Relevant Qualifications
All	Kenneth Goodwin	Associate Director	BSc Env. Sc, pDip Acoustics, MIOA, PIEMA, 15+ years' experience
Chapter 1-5	David Dwyer	Environmental Team Lead / Project Manager	BA, MSc with 10+ years' experience
Chapter 6	Dyfrig Hubble	Associate Director-Ecology, Biodiversity Chapter	BSc, MSc, CIEEM Full Member, 15+ years' experience.
Chapters 7 - 8	Nuria Manzanas	Principal Geologist	BSc, MSc, PGEO ('IGI'), Member IAH 8+ years' experience
Chapters 9-10	Klara Kovacic	Associate Director, Air Quality & Climate Chapter	MEng, MSc, DiB, Chartered Environmentalist with 18+ years' experience.

Chapter(s)	Name	Role	Relevant Qualifications
Chapter 11	Kenneth Goodwin	Associate Director - Acoustics, Chapter 10: Acoustics (Noise and Vibration);	BSc Env. Sc, pDip Acoustics, MIOA, PIEMA, 15+ years' experience
Chapter 12	Refer to Table 1-10 below		
Chapter 13	Refer to Table 1-10 below		
Chapter 14	Refer to Table 1-10 below		
Chapter 15	Kenneth Goodwin	Associate Director	BSc Env. Sc, pDip Acoustics, MIOA, PIEMA, 15+ years' experience
Chapter 16	Kenneth Goodwin	Associate Director	BSc Env. Sc, pDip Acoustics, MIOA, PIEMA, 15+ years' experience

In addition to the MOR Environmental project team, the following external specialists worked on the project:

Table 1-10: External Environmental Consultants

Primary Author	Company	Role	Relevant Qualifications
Richard Barker	Macro Works	Photomontages and Chapter 12: Landscape and Visual	BSc, H.Dip Env Eng, MSc, 6+ years' experience
Dr. Charles Mount	Not applicable	Archaeology and Chapter 13: Cultural Heritage	M.A. and Ph.D. degrees in Archaeology and a professional diploma in EIA and Strategic Environmental Assessment ('SEA') Management
Alan O'Reilly	PMCE	Chapter 14: Material Assets – Traffic and Transport	Chartered Engineer, BA, BAI, MSc, RSA Cert Comp, MIEI
Thomas Beattie	Six-West Ltd	UAV survey and drawings	MSci, Planning Consultant

2 PLANNING CONTEXT & THE NEED FOR THE PROPOSED DEVELOPMENT

2.1 Introduction

This Chapter focuses on setting out the need for the Proposed Development through analysis of the most recent CDP [5], planning guidelines, policy frameworks and reports issued by the county, state, and semi-state bodies.

2.2 Planning History

A study of the WCC e-planning website [1] demonstrated that there have been only two applications for planning permission on the lands pertaining to the Proposed Development, as set out in Table 2-1 below.

Table 2-1: Planning History at the Site

Planning Ref	Applicant	Application Date	Determination Date	Decision	Details
906374	J. Brady	16/10/1990	03/04/1991	Granted	Recommencement of quarrying operations, including provision of crushing plant and expansion of boundaries
211472	H. Stephenson	09/12/2021	08/02/2022	Refused	Extraction of rock by means of blasting down to 165mAOD, processing of material using mobile plant, landscaping and restoration of the quarry and all ancillary works.
2460294	H. Stephenson	29/05/2024	23/07/2024	Refused	The application sought permission for the reactivation of a 2-hectare quarry and a phased 6-hectare extension, reaching a quarry floor level of 165mOD through four 15m benches. Processing of material using mobile plant, landscaping and restoration of the quarry and all ancillary works. A 30-year plan was requested, and a Restoration Plan was included for post-extraction activities.

The WCC Area Engineer's Report states that in previous years, the Site had been used by WCC as a stone quarry. However, no earlier records appear on the e-planning website.

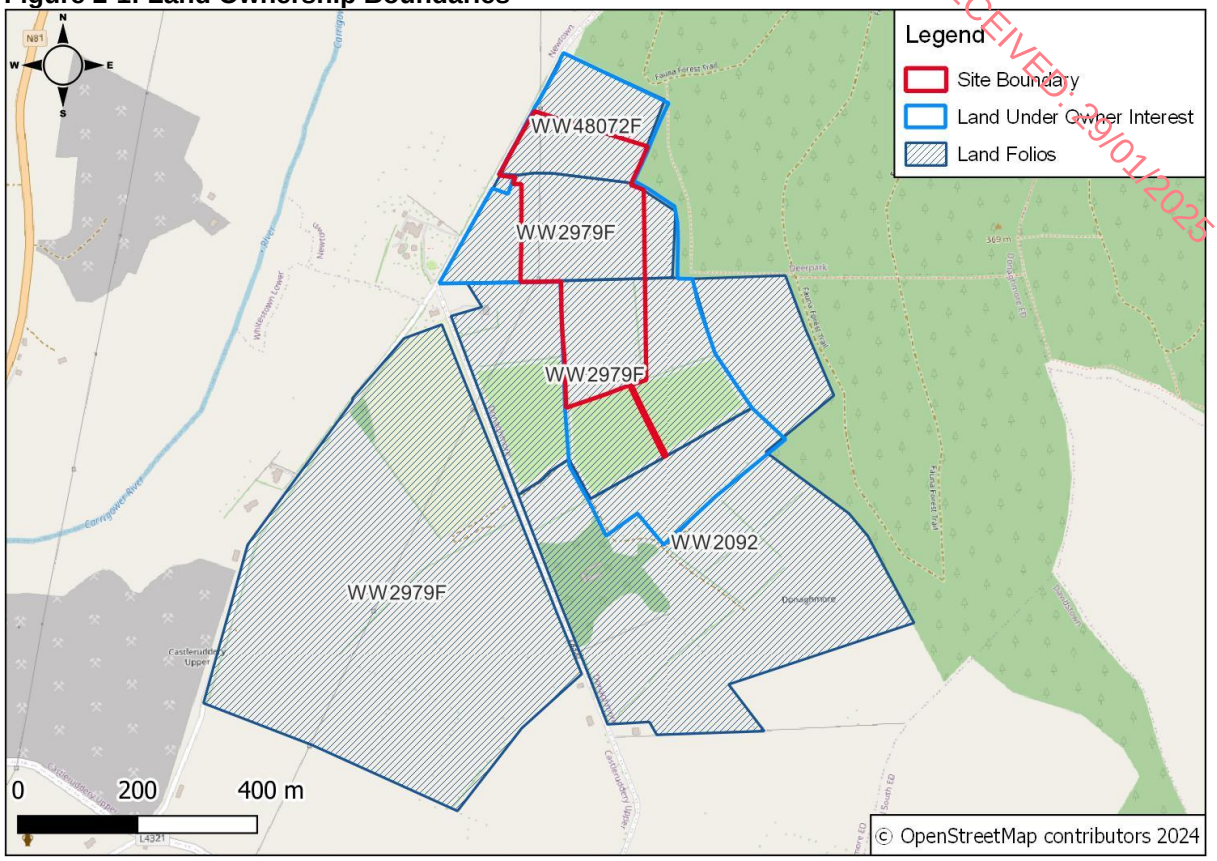
2.3 Ownership of the Lands

The Site occupies an area of ca. 8.1ha, inclusive of the greenfield extension lands to the east and the south of the old quarry.

The Applicant owns the old rock quarry which previously processed and stored aggregate on-site.

The greenfield extension lands are owned by a relative of Mr. Stephenson who has given their consent for the Applicant to make a planning application for the development of lands within the Site boundary. The letter of consent is included with this EIAR as Appendix 2-1. Figure 2-1 below shows the Site in the context of the land under owner interest boundary.

Figure 2-1: Land Ownership Boundaries



2.4 Neighbouring Lands

An examination of County Wicklow's e-planning website records [1] indicated that alongside key developments highlighted in Section 1.5 and detailed in Table 2-2 below, numerous applications were submitted for the immediately adjacent lands of the Site. However, the majority of these applications involved one-off residential developments or projects at the Old Rectory Centre.

Table 2-2: Planning Permissions for Local Notable Developments

Planning Ref	Applicant	Application Date	Determination Date	Decision	Location Relative to Site	Details
991815	Breslin Brothers Ltd.	23/12/1999	22/02/2000	Granted	To southeast	Retention of sand & gravel pit, continued sand & gravel extraction, incl. modification to site access, temporary screening banks and restoration of land to agricultural use on cessation of works
052224	Brownfield Restoration Ireland Ltd	31/01/2005	24/03/2005	Granted	To west	Integrated waste management facility on a 14.6 ha. site.
17748	A. Stephenson	22/06/2017	04/08/2017	Refused. Appealed to ABP and granted.	To southeast	Restoration of 2.3 ha. disused sand & gravel quarry to agricultural grassland by backfilling using imported inert soil & stone, applying a cover layer of soil and seeding with grasses and all temp. ancillary development, including one office, one portable toilet, one wheel wash and improvements to the site entrance, access gate, access road and internal access tracks. Activity will require importing ca. 227,250 tonnes and will require an EPA Waste Licence.
201117	J O'Neill	03/11/2020	05/07/2021	Granted	To northwest	Importation of soil & stones for use in site restoration of extraction area of 2.73 ha within pit area authorised under PL27/5/58916 at a rate of 23,000 tonnes/annum and cumulative tonnage of 115,000 tonnes, restoration of part of existing pit using site-won materials on 0.21 ha, associated civil works and site infrastructure, including wheel bath and access road.
201291	R. Kavanagh	17/12/2020	16/02/2022	Granted	To southwest	Importation of inert soil & stones for use, including through screening and soil recovery, in site restoration of an area of 1.26 ha with a former gravel pit, at a rate of 10,000 tonnes/annum (100,000 tonnes total), construction of wheel wash and weighbridge, use of mechanical screener, internal access arrangements and use of existing public road access.
22643	W. Stephenson	09/06/2022	10/02/2023	Refused (due to contradiction with 17748)	To southeast	Importation of concrete, storing of concrete, processing of concrete including crushing and screening and the storage of crushed concrete product pending re-use off-site. It is proposed to accept up to 15,000 tonnes/annum. The activity will require a Waste Facility Permit.

2.5 Policy Context

The Proposed Development has been reviewed considering national, regional and industrial policies within this section.

2.5.1 National Planning Context

Project Ireland 2040 was launched by the Government in February 2018 [17] to supersede the National Spatial Strategy. Project Ireland 2040 is the overarching policy and planning framework for the social, economic and cultural development of Ireland over the next 20 years.

Project Ireland 2040 incorporates two policy documents:

- The National Planning Framework ('NPF') [18], which is a strategic high-level plan for shaping future growth and development; and,
- The National Development Plan ('NDP') [19], updated in 2021, which outlines a strategy for investment of capital of over €116 billion to enable Project Ireland 2040.

2.5.1.1 Project Ireland 2040 – National Planning Framework

The Proposed Development will contribute to the expansion of the rural economy of Wicklow by facilitating the extraction within the county and thereby promoting a self-sustaining industry instead of commuter driven activity in Wicklow.

The NPF [18] states the importance of the aggregates industry in delivering Ireland's national infrastructure:

> *"Extractive industries are important for the supply of aggregates and construction materials and minerals to a variety of sectors, for both domestic requirements and for export. The planning process will play a key role in realising the potential of the extractive industries sector by identifying and protecting important reserves of aggregates and minerals from development that might prejudice their utilisation.*
>
> *Aggregates and minerals extraction will continue to be enabled where this is compatible with the protection of the environment in terms of air and water quality, natural and cultural heritage, the quality of life of residents in the vicinity, and provides for appropriate site rehabilitation".*

The extension and commission of quarrying activities at the Site will be a direct fulfilment of the national development objectives outlined in this Plan by providing aggregates for the local sector. In addition, the expansion of aggregate supply supports the housing goals set in by the Housing Agency within the plan:

> *"In the longer term to 2040, there will be a need for provision of at least 275,000 new homes in the cities, with half of these located in already built-up areas."*

In addition, the Plan sets out a target of sustainable growth of Ireland's rural communities, with approximately 50% of the projected population growth to 2040 intended to take place outside of the five major Irish cities (Dublin, Cork, Galway, Limerick and Waterford). Of this 50%, a minimum of 30% (15% of total population growth) is planned to take place within the existing built-up footprint of current settlements. Maintenance of the existing built-up footprint alongside the development of new urban infrastructure will require aggregate as a resource.

The extension and commission of aggregate supply also directly supports the housing goals set by the Housing Agency within the plan:

> *"In the longer term to 2040, there will be a need for provision of at least 275,000 new homes in the cities, with half of these located in already built-up areas."*

2.5.1.2 Project Ireland 2040 – National Development Plan

The NDP [19] estimates that the public investments in infrastructure etc. laid out in the NDP will sustain approximately 80,000 direct and indirect construction jobs per annum over the lifetime of the plan. It outlines the intent to deliver approximately 6,000 affordable homes per year and to improve regional accessibility through enhanced public infrastructure. Multiple National Road projects are also outlined in the NDP to improve connectivity and accessibility.

2.5.2 Industrial Policy and Planning

Following the launch of Project Ireland 2040, the Irish Concrete Federation released the report "Essential Aggregates: Providing for Ireland's Needs to 2040" [20]. It further emphasises the importance of aggregates as identified in the NPF, stating:

> *"It is essential that the importance of aggregates and aggregate based products to Ireland's future is recognised by Government and that Ireland's strategic reserves of aggregates are identified and protected and their use enabled in a sustainable manner. It is equally important that the quarrying industry plays its part in ensuring that operations are carried out in a sustainable manner and that the state's planning enforcement and procurement functions ensure that only authorised operators are entitled to supply the marketplace."*

The document breaks down the NPF into ten essential points as follows:

1) *Ireland has abundant natural reserves of high-quality aggregates (stone, sand and gravel);*
2) *These Aggregates are the essential raw materials from which Ireland's future infrastructure will be built, including our homes, offices, schools, hospitals and transport network;*
3) *Aggregates can only be accessed where they occur. Currently there are approximately 500 large commercial quarries extracting aggregates throughout Ireland;*
4) *The supply of local aggregates is essential to the sustainable development of Irish communities. Local supplies of raw materials reduce transport distances, thereby reducing their carbon footprint compared to non-local sources;*
5) *Current demand for aggregates in Ireland at 12 tonnes per capita is twice the average demand in the EU 28. Project Ireland 2040 will necessitate the production of approximately 1.5 billion tonnes of aggregates;*
6) *Scarcities of some particular aggregate products are already emerging in the eastern and midland regions. Therefore, the future supply of aggregates needs to be planned, monitored and managed in a sustainable manner;*
7) *In recognition of the strategically essential role of aggregates, Ireland needs a National Aggregates Planning Policy to underpin local and regional planning policy;*
8) *To provide for the country's future development, Ireland's strategic reserves of aggregates need to be identified, quantified and protected;*
9) *A robust, effective and efficient planning system for quarries is necessary to ensure that the extraction of Ireland's aggregate reserve is enabled in a sustainable manner. Currently, the average decision-making timeframe for quarry planning applications is 76 weeks with some decisions taking in excess of 2 years; and,*
10) *The state's planning enforcement and procurement functions must ensure that only authorised operators are entitled to supply the marketplace.'*

The Proposed Development is an extension and commission of the quarry into a known aggregate reserve which will help maintain the supply of aggregates. The document identifies

both the restricted access to aggregates (which are limited by location) as well as the demand for *"approximately 1.5 billion tonnes of aggregates"* to facilitate the goals of Project Ireland 2040. It notes that there are arising scarcities in particular aggregate products, such as gravel, where:

> *"in the eastern and midland regions of the country* [scarcities] *are already emerging as terrestrial sources of aggregates from sand and gravel and rock deposits continue to be diminished."*

Therefore, based on this report, there is a clear ongoing demand for aggregates in order to meet the goals of Project Ireland 2040. Given the increasing scarcities noted in this report by the Irish Concrete Federation, the Proposed Development has the potential to be an important resource for the Eastern and Midlands region. Therefore, the Proposed Development will help maintain the supply of aggregates within the Eastern and Midlands region and will help facilitate the goals of Project Ireland 2040.

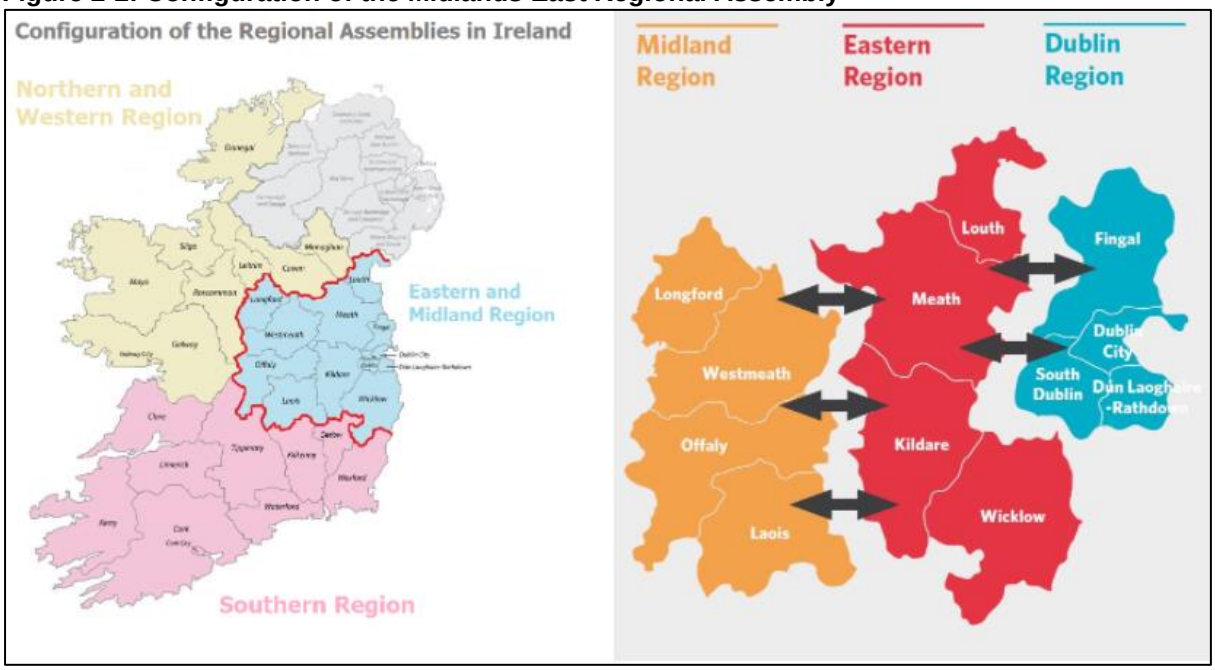
2.5.3 Regional Planning Policy Context

The Regional planning policy context is covered by the Eastern and Midland Regional Assembly for county Wicklow. The Mid-East Planning Area, which consists of Counties Kildare, Meath and Wicklow. The Mid-East Planning area sits within the Eastern and Midland Regional Assembly, which also comprises the following counties:

- Dublin;
- Kildare;
- Laois;
- Longford;
- Louth;
- Offaly; and,
- Westmeath.

See Figure 2-2 below for context.

Figure 2-2: Configuration of the Midlands East Regional Assembly



The Eastern and Midland Regional Assembly has assumed several new functions, first and foremost being the creation and delivery of a Regional Spatial and Economic Strategy ('RSES') for the Eastern and Midland Region of Ireland 2019 to 2031 [21].

The RSES is the link between the Project Ireland 2040 NPF, the City & County Development Plans and the Local Economic & Community Plans ('LECP') of the twelve local authorities in the region.

The RSES notes specifically the importance of the aggregate industry to rural employment and economic strength, as noted in policy RPO 6.7:

RPO 6.7:

> *'Support local authorities to develop sustainable and economically efficient rural economies through initiatives to enhance sectors such as agricultural and food, forestry, fishing and aquaculture, energy and extractive industries, the bioeconomy, tourism, and diversification into alternative on-farm and off-farm activities, while at the same time noting the importance of maintaining and protecting the natural landscape and built heritage.'*

Furthermore, the strategy looks to the ongoing need for investment in infrastructure within the Region, which will require a local supply of good quality aggregate, through policy RPO 6.33:

RPO 6.33:

> *'With the allocation outcomes from the competitive calls EMRA, in cooperation with the Department of Public Expenditure and Reform ('DPER'), will prepare a Regional Investment Plan for the Region in accordance with Project Ireland 2040 and the Public Spending Code.'*

2.5.4 Local Policy

WCC adopted the CDP on 12th September 2022 [5]. The CDP outlines the objectives and actions for economic and community development. The aim of the CDP is to:

> *"to guide and facilitate the sustainable growth of the County in a manner which supports a deep respect for its unique natural heritage, capitalises on the potential of our towns and villages to deliver compact growth, facilitates healthy placemaking, supports the creation of self-sustaining settlements and rural areas that are attractive places to live in, work in and visit, provides for new job opportunities, embraces climate action and enables the transition to a low carbon, climate resilient and environmentally sustainable economy, improves sustainable mobility and conserves our heritage."*

The Council recognises the importance of the extractive industries in the development of Wicklow, stating that:

> *"The objectives will aim to support existing resource-based industries, including energy generation, agriculture, forestry, fishing, and the extractive industry, while also promoting the diversification of the rural economy."*

To address this conflict, the Council outlines a number of policy objectives within the CDP that specifically address the extractive industries within the rural economy:

CPO 9.5.2

> *"To facilitate and encourage the exploration and exploitation of minerals in the County in a manner, which is consistent with the principle of sustainability and protection of residential, environmental and tourism amenities."*

CPO 9.5.5

To have regard to the following guidance documents (as may be amended, replaced or supplemented) in the assessment of planning applications for quarries and ancillary facilities:

- *'Quarries and Ancillary Activities: Guidelines for Planning Authorities' (2004, DoEHLG);*
- *'Environmental Management Guidelines – Environmental Management in the Extractive;*
- *Industry (Non-Scheduled Minerals)', EPA 2006;*
- *'Archaeological Code of Practice between the DoEHLG and the Irish Concrete Federation' 2009;*
- *'Geological Heritage Guidelines for the Extractive Industry', 2008; and,*
- *'Wildlife, Habitats and the Extractive Industry – Guidelines for the protection of biodiversity within the extractive industry', NPWS 2009.*

Within the policies regarding soils and geology protection the CDP states:

CPO 17.27

"Geological and soil mapping where available shall be considered in planning decisions relating to settlement, excavation, flooding, food production value and carbon sequestration, to identify prime agricultural lands (for food production), degraded/contaminated lands (which may have implications for water quality, health, fauna), lands with unstable soils / geology or at risk of landslides, and those which are essential for habitat protection, or have geological significance."

CPO 17.29

"To consult with the Geological Survey of Ireland as is deemed necessary, when dealing with any proposals for major developments, which will entail 'significant' ground excavation, such as quarrying, road cuttings, tunnels, major drainage works, and foundations for industrial or large buildings and complexes."

CPO 17.32

> *"To facilitate the exploitation of mineral resources, in an environmentally sensitive manner, in accordance with the objectives and control measures set out in Chapter 9 and in the Design & Development standards of this plan."*

The aggregate from the Proposed Development will be used for infrastructure projects throughout the region. Aggregate is an essential material for the construction and upkeep of houses, school, hospitals, stadiums, shopping areas and other essential building and civil engineering projects, including those set out in Project Ireland 2040. The extraction activities for the Proposed Development are in line with the CDP.

2.6 The Need for the Proposed Development

The Proposed Development will allow for the extraction of quality aggregates and supply to the extractive industry market. The benefit of supplying to this market for the economic growth of the region is in congruence with the aims set out in the CDP.

The policies and objectives of the local and strategic plans for the Eastern and Midlands area, as outlined in Section 2.5 above, target the economic and infrastructural development of the region. These plans will require the supply of good-quality aggregate material from a selection of competitive quarry operators and quarry sites.

The projected growth requires new infrastructure, including housing, schools and other public services and transport networks. The Regional policy seeks to make efficient use of the Region's natural resources and to carry out major developments within the framework of national policy. From a local sense, the ambitious goals, set by WCC in respect of housing, education, and public infrastructure will not be attainable without a sufficient source of suitably situated quality aggregates. Even within the context of a circular economic model, this will require substantial quantities of raw materials, including aggregates, and the intended rural growth means that the market for building materials will have a strong regional and local element. The Proposed Development will facilitate the sustainable extraction of aggregates, a vital resource for housing, infrastructure, and economic development in Wicklow and the Eastern and Midlands region.

With growing demand for aggregates, particularly in light of housing targets (275,000 new homes by 2040) and infrastructure projects, the development will address emerging scarcities in the eastern region. It supports local supply chains, reduces carbon footprints for local projects, and promotes economic self-sufficiency in Wicklow, contributing directly to regional and national goals. Furthermore, it aligns with the CDP by facilitating sustainable resource extraction in an environmentally responsible manner, thereby meeting both local and national planning objectives.

3 DESCRIPTION OF THE PROPOSED DEVELOPMENT

3.1 Introduction

This Chapter provides a detailed description of the Proposed Development comprising information on the Site design, size and other relevant features.

3.2 Overview of the Proposed Development

The Proposed Development covers an area of ca. 8.1ha., extending from the old quarry at Deerpark into the greenfield extension lands to the east and south. Refer to Plates 3-1 and 3-2 below for context.

Plate 3-1: Old Quarry – View of existing quarry face and benches

Plate 3-2: Extension lands – View from Southern Boundary Facing Southwest

The Site has an estimated reserve of ca. 1,283,500m^3 or 3,080,400 tonnes of aggregates and a proposed extraction area of ca. 5.01ha.

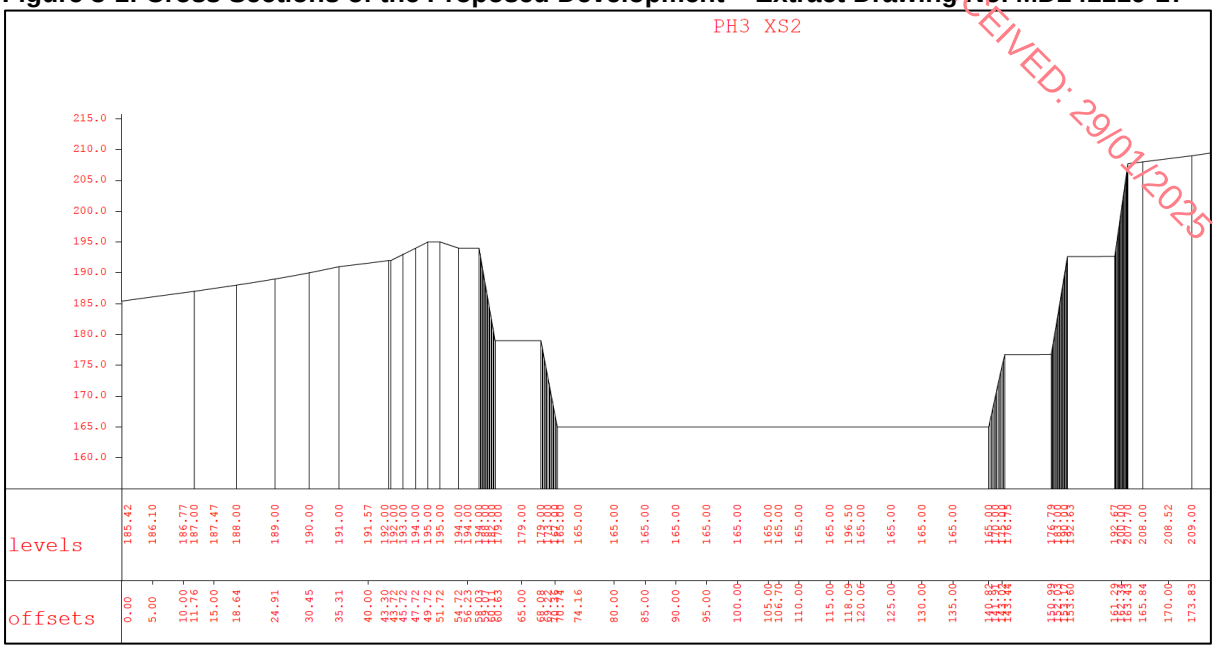
The Proposed Development will involve the stripping of existing overburden to access the underlying rock within the proposed extraction area. Overburden removed will be used to construct peripheral screening berms along the boundaries of the Site. Berms will be planted with native species to stabilise the berms. To minimise the area of exposed ground, the removal of soils and overburden will be done on a phased basis, as required by the quarry operator.

Initial works will consist of smaller controlled blasts releasing smaller quantities of aggregate from the targeted working face. Following this, the quarry will move into phase one production, with the blasting of the existing old quarry rock face and the extension of the quarry to the east. Industry-standard blasting methods will be utilised at predetermined times. These are proposed to occur at an average rate of twelve blasts per year to produce broken rock. The quarry will operate a series of 15m high benches.

The Proposed Development will operate as a dry processing quarry, including activities such as rock crushing, screening, stockpiling and periodic rock breaking. All processing and aggregate storage will occur within the quarry floor, and extracted material will be stockpiled short-term on-site prior to loading and transportation to customers.

The Site has a sloping topography, dropping from a high ground level of ca. 220mAOD on the east to a low point of ca. 164mAOD along the local road boundary. In order to develop the Site to the quarry floor level of 165mAOD, up to three benches of 15m will be required on the eastern section of the Site. Cross sections of the Proposed Development's finished extraction levels are included in Figure 3-1 below, as extracted from Drawing No. MD230824 Rev3 Phase 5 Sections.

Figure 3-1: Cross Sections of the Proposed Development – Extract Drawing No. MD241119-17



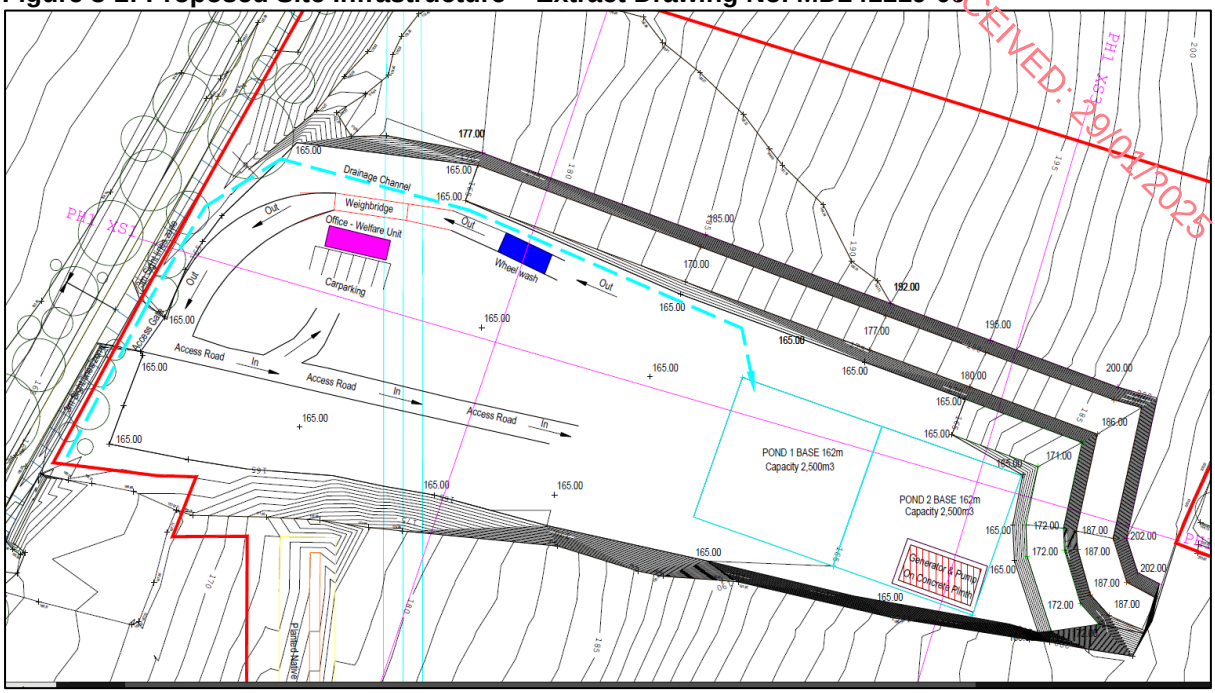
The Proposed Development will be a re-commissioning and extension of the historic quarrying activities. As such, the Proposed Development will incorporate blasting, crushing, screening and stockpiling of materials into its operational phase and provide additional employment.

The Proposed Development will install ancillary infrastructure within the old quarry area, including:

- Site office;
- Welfare facilities;
- Weighbridge;
- Wheel wash;
- Crushing and screening equipment; and,
- Storage.

Refer to Figure 3-2 below.

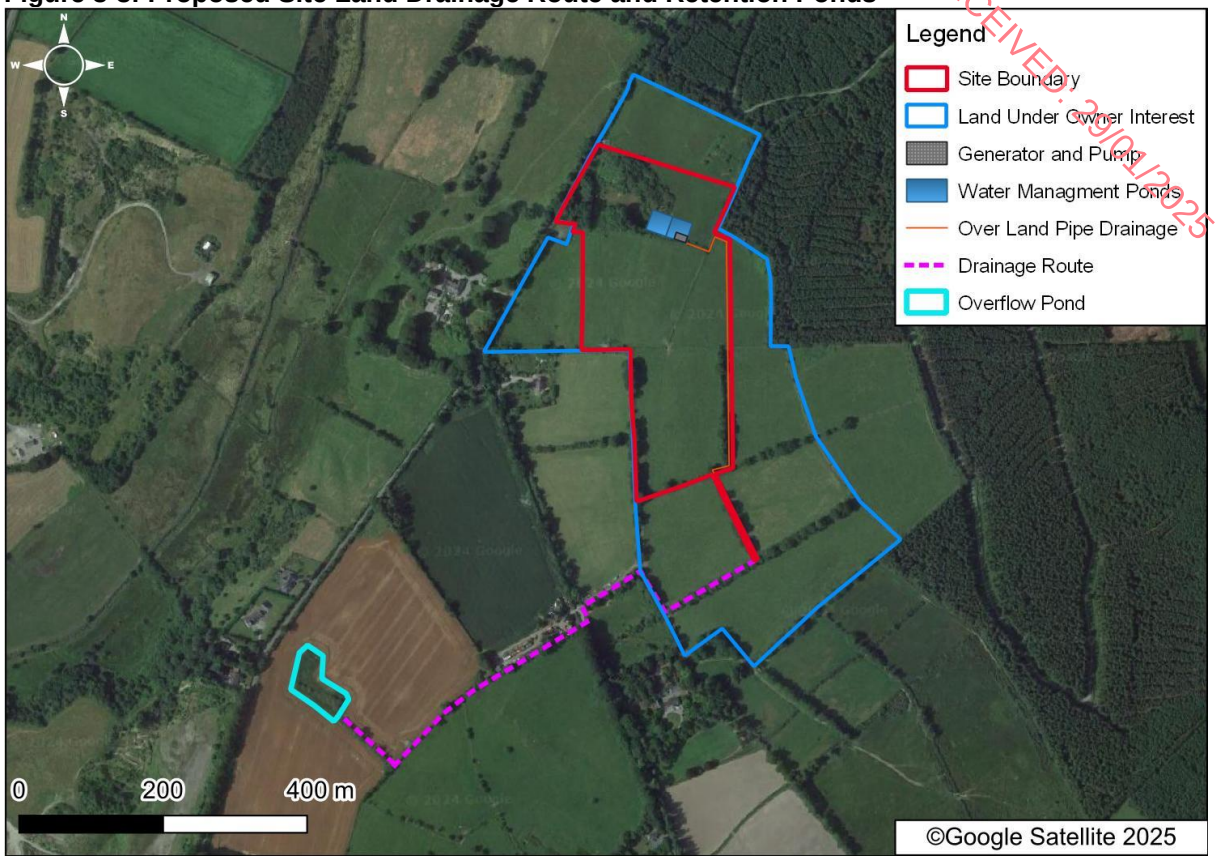
Figure 3-2: Proposed Site Infrastructure – Extract Drawing No. MD241119-09



During the final stages of Phase 1 development, a water management pond system will be developed on the eastern floor. These ponds will be ca. 3m lower than the pit floor and will allow for quarry floor water to flow into the first pond. Controlled flow into the second pond will occur to improve the settlement of any entrained dusts. The inflow of water, both from groundwater and rainwater, will be managed typically through evapotranspiration to the ground. Most quarry floor water will be collected stormwater. Occasional storm events will require water management. A placement for a pump and generator is therefore facilitated to allow for water to be removed from the Site to the local land drains to the south of the Site, which flow through existing ditches to a pond southwest of the Site. This pond and land are owned by the same landowner as the Site.

A drainage channel is positioned to the west along the Site entrance, see the magenta line in Figure 3-2 above, and runs along the western and northern boundary to manage rainwater flow on the land adjacent to the local road of the Site. This channel directs any excess rainwater into the catchment system. Refer to Section 8.4.2 below for further details; Figure 3-3 below presents the general route from the Site via existing land drainage channels to the existing pond to the southwest.

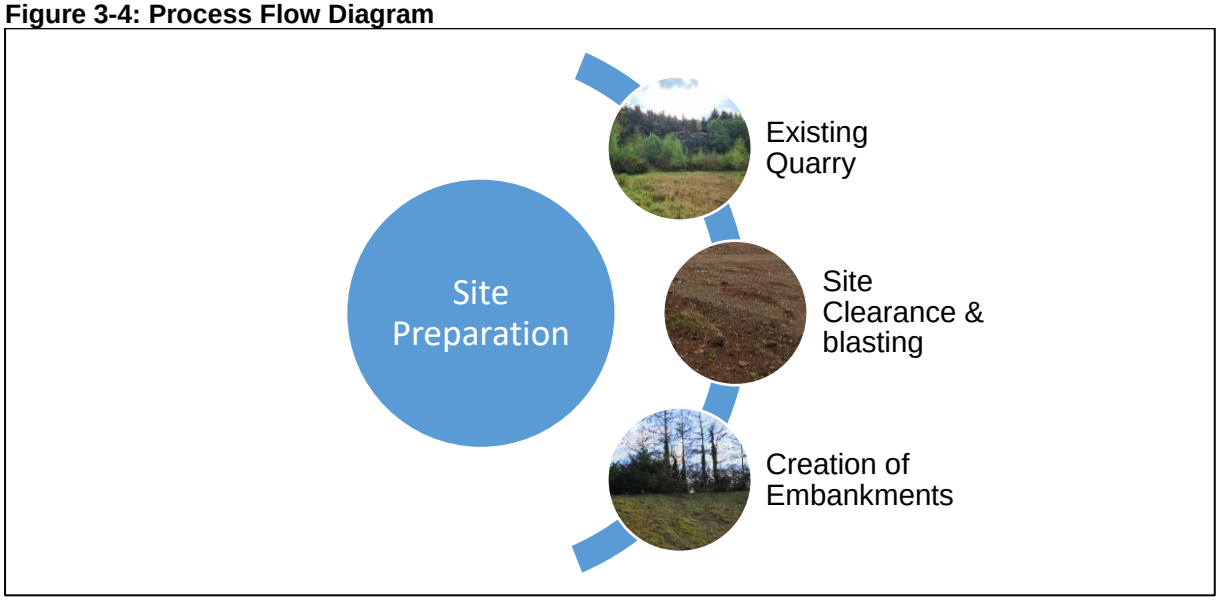
Figure 3-3: Proposed Site Land Drainage Route and Retention Ponds

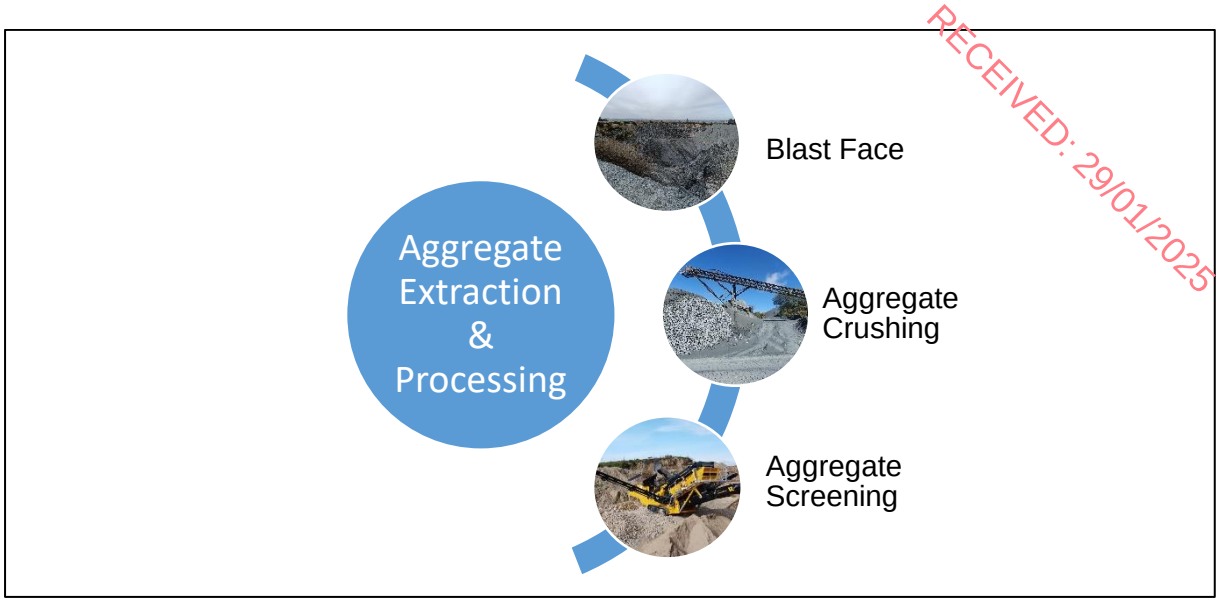


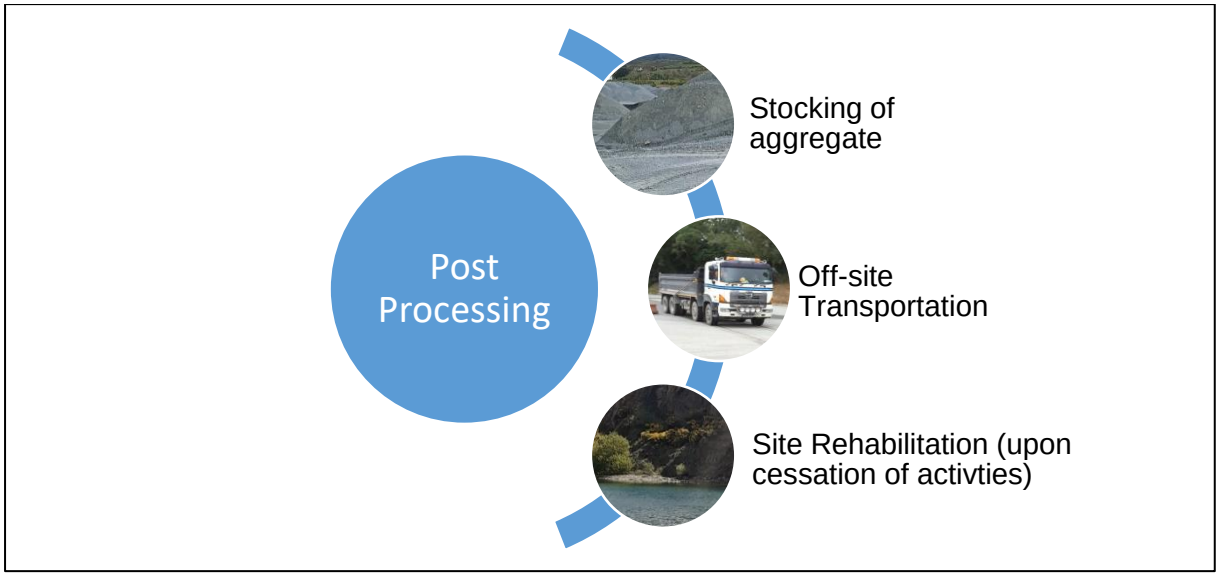
Upon removal of the aggregate reserve, the Site will undergo rehabilitation as per the Restoration Plan attached as Appendix 6-1. The Restoration Plan has been designed to encompass the full area of land under owner interest.

The general process from the Site preparation works through to rehabilitation is shown in Figure 3-4 below.

Figure 3-4: Process Flow Diagram







3.2.1 Scale of the Proposed Development

The Site is ca. 8.1ha in size which includes a proposed extraction area of ca. 5.01ha. It is proposed to extract an average of 200,000 tonnes of aggregates per annum.

An overview of the timelines associated with the Proposed Development are as follows;

- Construction Phase (up to 12 months);
- Operational Phase (15.5 - 22 years); and,
- Restoration Phase (two years).

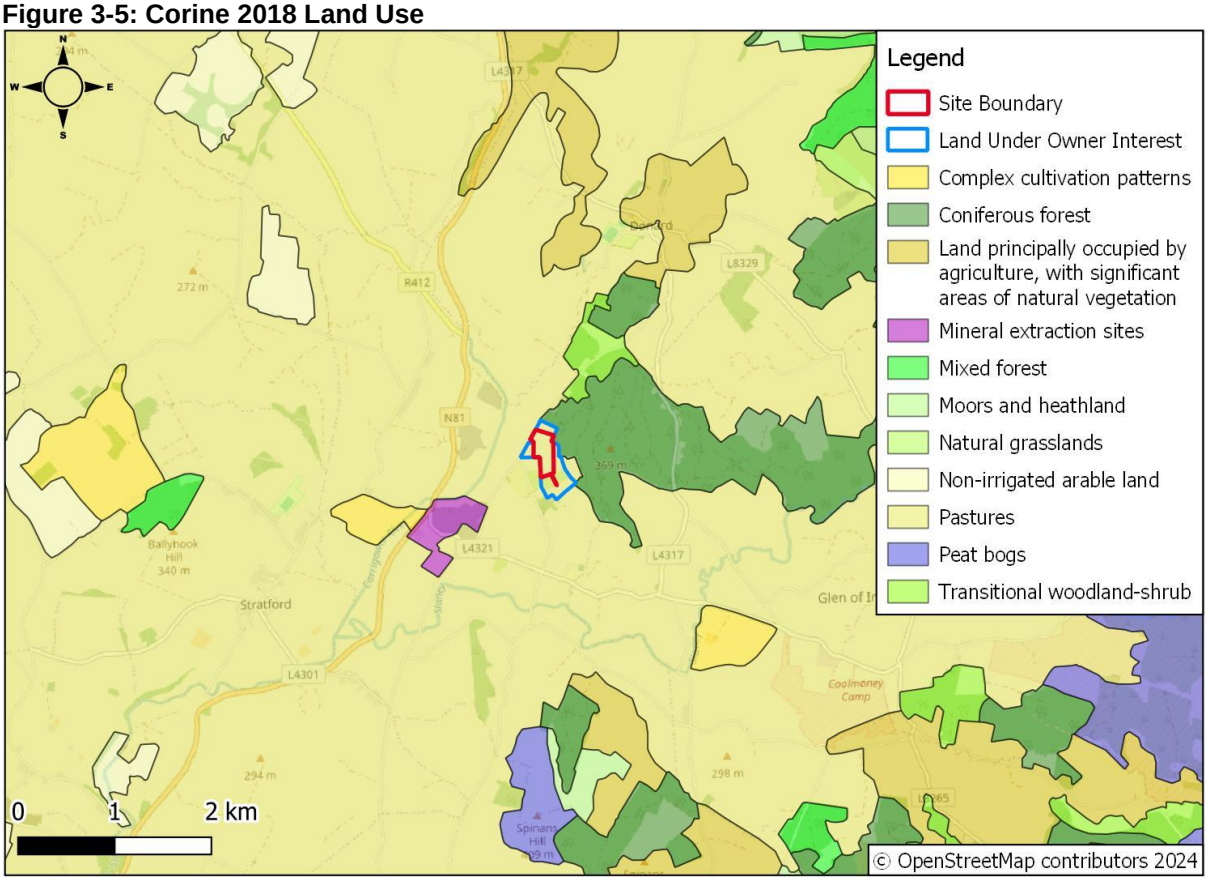
If the Proposed Development meets the proposed extraction rate (ca. 200,000 tonnes per annum), the extension lands could be exhausted through an operational phase of ca. 15.5 years. However, due to unknown future economic and market needs, it is likely the Proposed Development will extract lower rates than the permitted extraction rate and will, therefore, need a longer operational period. Planning permission is being sought for 25 years.

3.2.1.1 Land-take

The Proposed Development incorporates an overall area of ca. 8.1ha with an extraction area of ca. 5.01ha, which will extend in an easterly and southerly direction.

The land at the Proposed Development is owned by the Applicant and Mr. T Stephenson (refer to Appendix 2-1) and is utilised for agricultural purposes. Based on the Corine 2018 dataset, the locality is dominated by agricultural fields in the form of pastures with pockets of forest to the north and east. A quarry southwest of the Site is classified as a mineral extraction site. Refer to Figure 3-5 below for further details.

Figure 3-5: Corine 2018 Land Use



3.3 Development Phasing

There are distinct activities associated with the works of each phase of the Proposed Development. As part of the assessment, there will be three phases assessed under each environmental topic:

- Construction Phase;
- Operational Phase; and,
- Rehabilitation Phase.

3.3.1 Construction Phase - Site Preparation / Overburden Stripping

The Construction Phase relates to the preparation of the old quarry for aggregate processing activities. Initial work within the old quarry involves the clearing of vegetation and reduction in the floor level in order to prepare the face for blasting. In tandem with these preparation works, the quarry area adjacent to the local road will be improved to provide for a modern site entrance of the local road, positioning of an office with welfare, weighbridge, water management ponds, wheel wash and parking. A woodland area will also be planted to the

north of the Site within the lands under owner interest to compensate for vegetation clearance works (refer to Chapter 6).

Prior to each phase of operational development, the topsoil and overburden will need to be removed. This material will be utilised in the creation of the boundary embankments/berms and planted with native species to stabilise the berm; refer to Appendix 6-1 for further details. Additional planting will also occur along the eastern Site boundary; refer to Appendix 6-1 for further details. To minimise the area of exposed ground, soils and overburden will be removed prior to the need for a new phase of extraction. Plant for overburden removal will primarily include the use of an excavator and wheel loaders. This phase will result in an exposed rock outcropping.

General infrastructure required for the Proposed Development, such as Site office, welfare facilities, parking, weighbridge, wheel wash, mobile crushing plant and screeners are shown in Figure 3-2 above. Therefore, additional Site infrastructure will be constructed, and the potential impacts associated with the Construction Phase are assessed in the EIAR.

The construction phase will likely require a year to complete.

3.3.2 Operational Phase - Aggregate Extraction and Processing

The Operational Phase will include the following activities:

- Drilling and blasting of the rock face;
- The crushing and screening of aggregate by size / weight, including the placement of aggregate within stockpiles; and,
- The haulage of aggregate from the Site.

3.3.2.1 Preparation for Blasting

A drill rig will be positioned on the top of the bench that will be the subject of the blast. A pattern of holes, generally in staggered rows, will be drilled to a predetermined specified depth and diameter. The drillholes, to be specified by the Blasting Specialist, will be dependent upon the size of the blast to be generated, the rock encountered, and the condition of the rock to be blasted (known fracturing or changes in type). This preparatory work will typically last for several days.

The Blasting Specialist will notify the supplier of the explosives, arrange the delivery and the date of the blast. An application must be made to the Gardai for a licence for the blast.

All residents within 500m from the Site boundary will be notified of the proposed blast date, including details for contacting the Site in the event of pre-blast enquiries or post-blast submissions.

3.3.2.2 Blasting

On the date of the blast, the Blasting Specialist will place the necessary quantity of explosives at the pre-determined depth and position, and back-fill (‘stem’) each hole with small grit.

A safety zone will be established, where all personnel, plant and equipment will be removed from this zone. The safety zone will be specified by the Blasting Specialist and will be enforced by the Site Manager. Typically, no other operations on the Site within the blast zone will occur during a planned blast event.

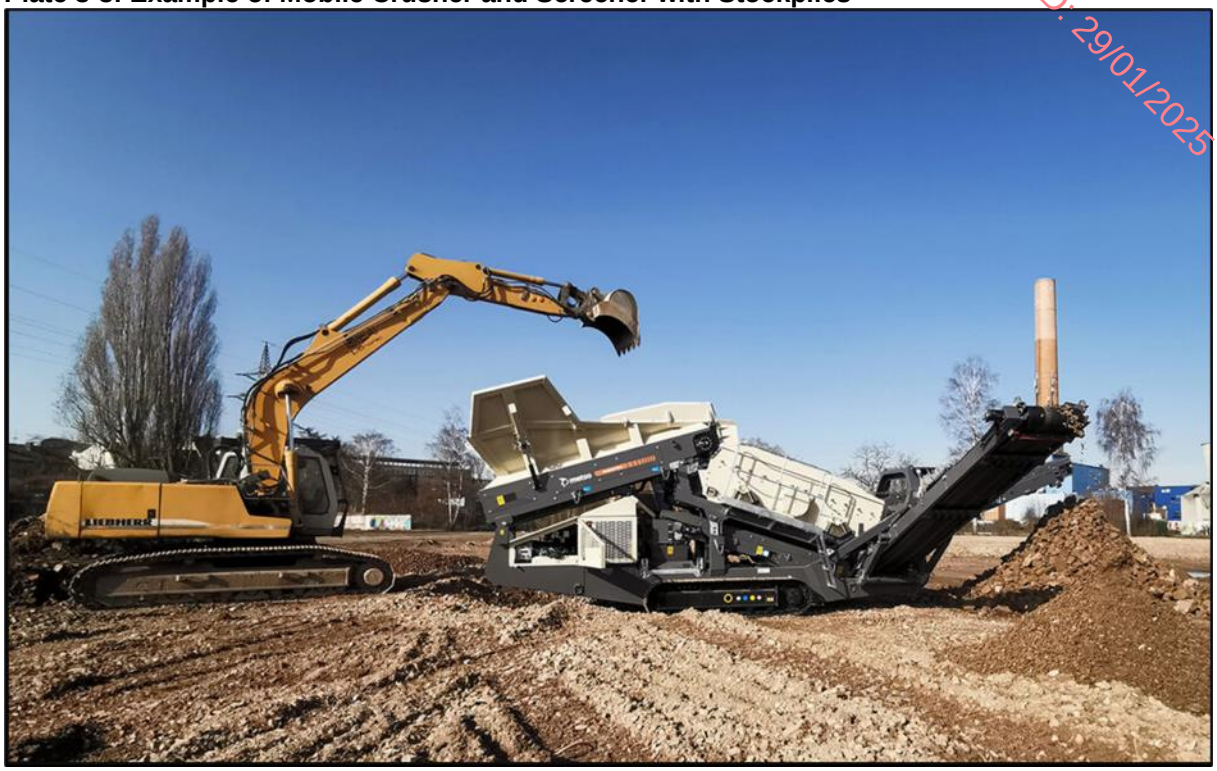
As noted in Chapter 11 below, during a blast event, vibration and air-over pressure monitoring will occur at the closest receptor(s).

3.3.2.3 Crushing & Stockpiling of Aggregate

The broken rock will be transported by wheeled loaders to the mobile primary crushing and screening plant which will follow the working face within the quarry. This will break the rock

into pre-selected sizes / grades, generating aggregate stockpiles of graded rock. This is a mechanical process; refer to Plate 3-3 below.

Plate 3-3: Example of Mobile Crusher and Screener with Stockpiles



3.3.2.4 Export of Material

Aggregate will be exported from the Site by heavy goods vehicles ('HGVs'). An average extraction rate of ca. 200,000 tonnes of aggregate material will be excavated from the Site annually. This extraction rate has been used for determining the daily traffic volumes associated with the Proposed Development. Table 3-1 provides an overview of the predicted export quantities and daily trips from HGVs associated with the Proposed Development.

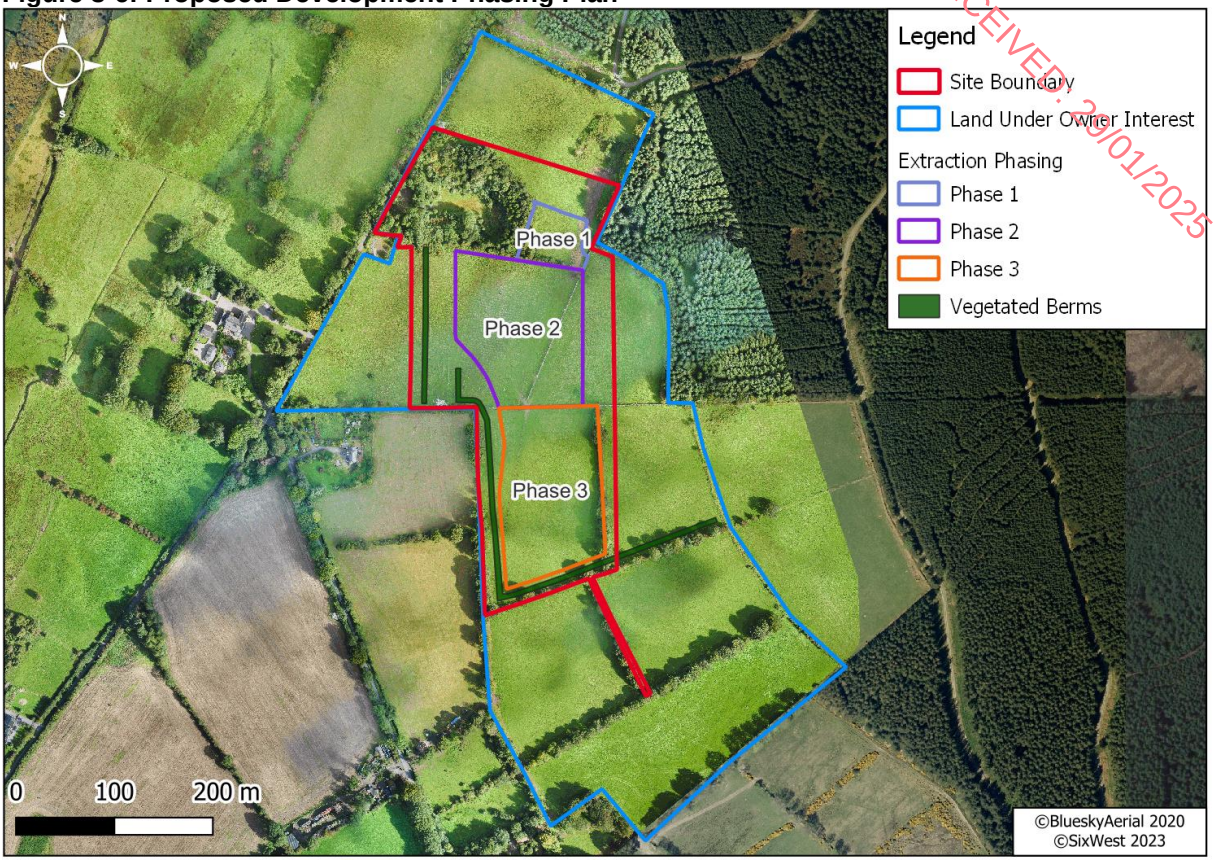
Table 3-1: Exported Quantities of Material and Average Daily Trips

Exported Quantities of Material and Average Daily Trips	
Average Total Exported Material (tonnes per annum)	200,000
Quantity per Week (48 operational weeks/year)	4,167
Quantity per day (5.5 workings days/week)	758
Loads per day (25 tonnes per load)	31

3.3.2.5 Extraction Phasing

The Proposed Development will be phased over its lifetime. This will limit the exposed rock at any one stage at existing ground level and will enable the establishment of boundary mitigation features, such as the tree and foliage growth on the southern berms. The phasing plan is outlined in Figure 3-6 below.

Figure 3-6: Proposed Development Phasing Plan



Phase 1 (2-3 years) will see the development of the old quarry to its original planned extent and depth, and the creation of the water management system. An estimated reserve of ca. 186,000m^3 (ca. 14%) of the total will be extracted in this phase of work.

Phase 2 (6-9 years) will extend the quarry south along the western boundary. This phase will be on the lower elevation ground and will benefit from the berm creation to the west. An estimated reserve of ca. 525,000m^3 (ca. 41%) of the total will be extracted in this phase of work.

Phase 3 (7-10 years) will complete the southern extent of the Proposed Development along the western boundary. The western berms will be established with tree development improving the visual screening. An estimated reserve of ca. 572,500m^3 (ca.45%) of the total will be extracted in this phase of work.

Although each phase of development is shown as a distinct element, operationally it will be necessary to commence the next phase prior to the completion of a phase of development. These phases may occur chronologically or not depending on the life stage of the quarry. This will ensure that blasting occurs onto a quarry floor below it of ca. 15m depth, along with the requirements for safe haulage routes.

3.3.3 Rehabilitation Phase - Site Closure

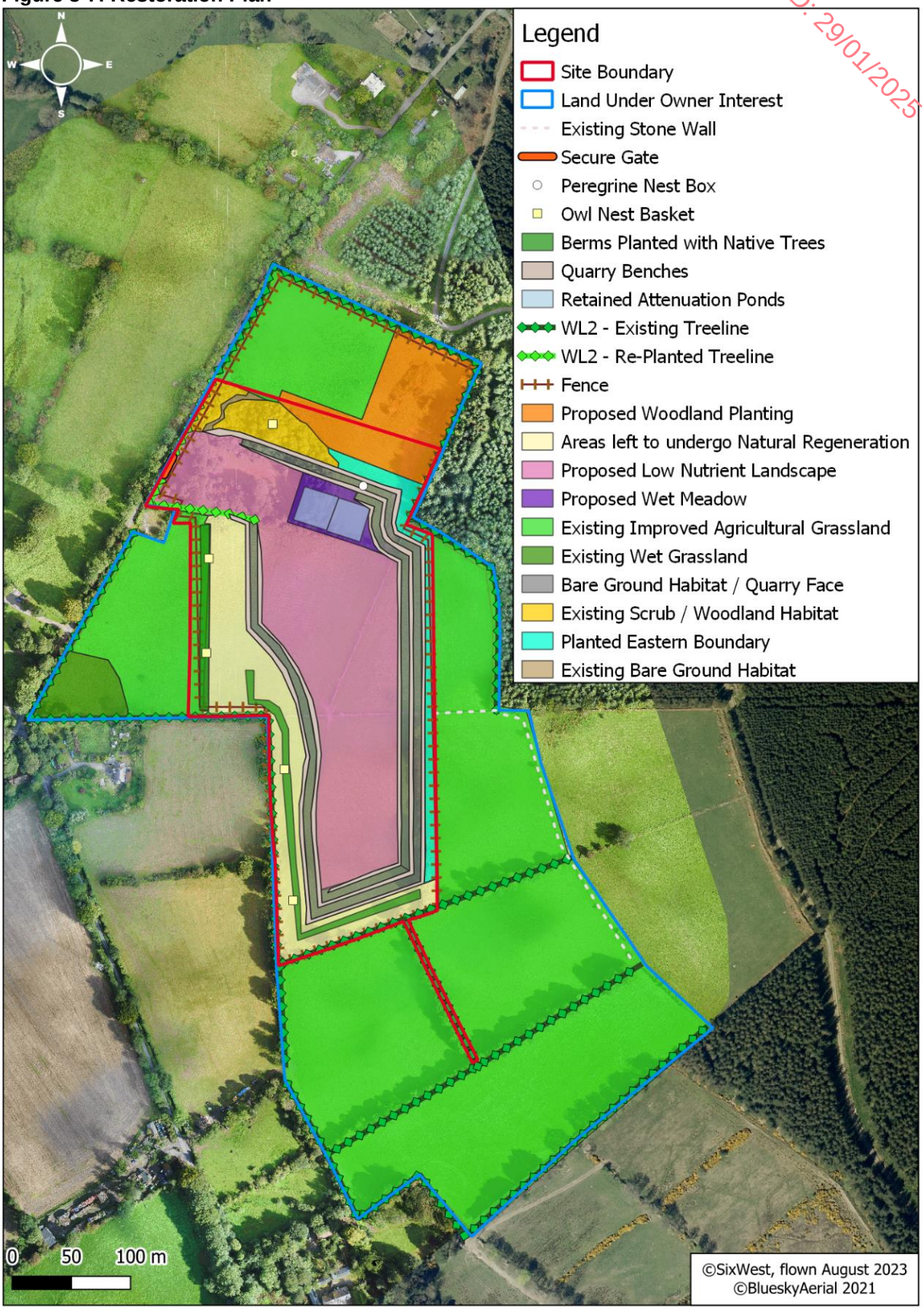
A Restoration Plan is submitted as part of this application (attached as Appendix 6-1). This plan outlines the proposed restoration measures for each phase of the Proposed Development alongside the measures to be undertaken once operations have ceased.

During the operational phase, planting along the berms and within the woodland habitats will become established, thereby reducing the overall impact (i.e. dust, visual, flora and fauna).

Once operations have ceased, the Restoration Plan will provide a mosaic of habitats including woodland areas, retained and re-planted treelines, a species-rich grassland, ponds, bare

ground scrapes / unvegetated quarry benches and areas of recolonising bare ground where natural succession and regeneration will occur over time. Refer to Figure 3-7 below for context.

Figure 3-7: Restoration Plan



3.4 Development Design and Management

3.4.1 Operational Hours and Staffing

The main operational processing hours for the Proposed Development will be:

- Monday to Friday: 08:00 to 18:00;
- Saturday: 08:00 to 14:00; and,
- Sunday & Public Holidays: Closed.

HGV movements in and out of the quarry will occur up to one hour before and after processing operations – i.e. between 07:00 – 19:00. This is to allow for departure of HGVs loaded the previous day and ensure returning HGVs can access the Site at the end of the day.

The quarry will support ca. 5-8 full-time employees arising from on-site personnel, and maintenance personnel. The Proposed Development will result in increased employment indirectly through the need for hauliers and employee purchases at local businesses.

3.4.2 Car Park

Car parking facilities for on-site personnel and hauliers will be constructed within the old quarry, as part of the Proposed Development. Car spaces will be designated by the office unit.

3.4.3 Welfare

A main office/welfare unit within the quarry will provide welfare facilities for the Site. This building contains a cafeteria, toilet and sink. There will be no mains water connection on-site. Drinking water will be provided via container. Welfare water will be provided via an on-site well.

3.4.4 Drainage

Currently, the Site is not bounded by streams/rivers. Rainwater across the Site percolates to the ground. A drainage channel along the vehicular entrance connects to the water management system to prevent water from leaving the Site.

Generally, within the Site, water arising from the Proposed Development will consist of groundwater seepage and rainwater; refer to Chapter 8: Water. Two water management ponds of ca. 2,500m^3 each will be developed during Phase 1 works to allow water on the ground of the quarry to drain into. Each pond will be ca. 3m lower than the quarry floor; refer to Figure 3-3 above for context.

As outlined in Chapter 8, typically, the seepage into the Proposed Development and rainfall will be of low volume. However, periodic pumping of water from the water management ponds via an overground pipe to the land drain and evaporation will be sufficient to offset these incoming flows.

Where water is pumped into the land drain to the south of the Site, it will follow the natural drainage route of the land drain, ultimately reaching an existing pond situated in a family member's field to the southwest of the Site. Further details on Site drainage are presented in Chapter 8: Water.

3.4.5 Weighbridge and Wheel Wash

A wheel wash and weighbridge will be constructed within the old quarry area near the quarry entrance. Water for the wheel wash will be provided via an on-site well. The wheel wash water will be recycled for further use. During prolonged periods of dry weather, it can be topped up from the well supply. The wheel wash will be cleaned out regularly, with sludge removed off-site in accordance with the requirements of the relevant waste legislation.

Hardstanding will be constructed on either side of the wheel wash and weighbridge to mitigate track-out from HGVs. Moreover, a road sweeper will be available to clean the public roads as required. This will be determined from visual inspections.

3.4.6 Fuel and Oil Storage

No fuel will be stored within the Site. Re-fuelling of mobile plant will be via a fuel bowser.

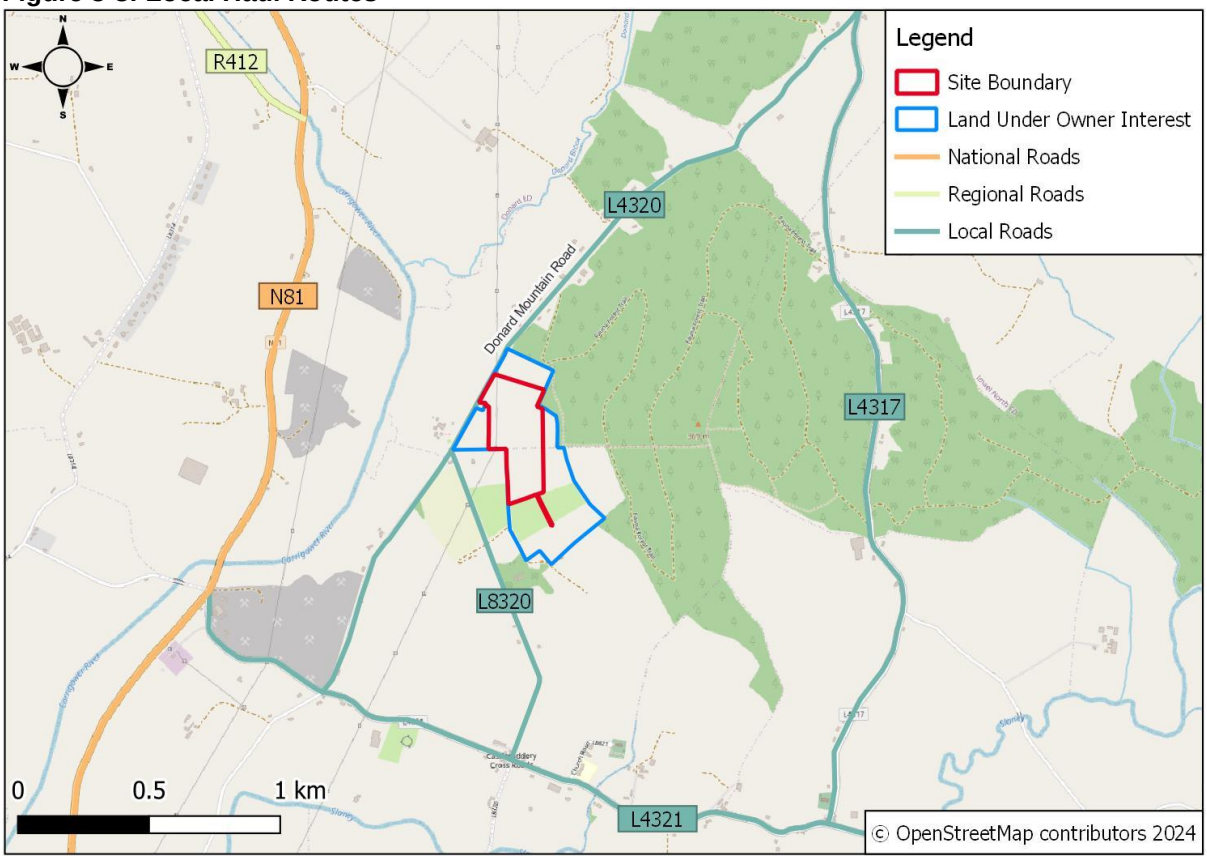
It is important to note that all plant and machinery will be subject to refuelling procedures within the Site and will be refuelled by a competent person utilising a drip tray. In addition, absorbent sands and a full spill kit system will be stored within the Site.

Nonetheless, environmental risks to soils and groundwater and relevant mitigation measures are outlined in Chapter 7: Lands, Soils and Geology and Chapter 8: Water.

3.4.7 Transportation, Roads and Traffic

The Proposed Development will utilise an improved access gate. HGVs will travel via the N81 and the Donard Mountain Road to gain access to the Site. Return routes will utilise the same route; refer to Figure 3-8 below.

Figure 3-8: Local Haul Routes



There will be an average of 31 Loads per day (25 tonnes per load) and a maximum of 80 trips and 62 of which are associated with HGVs during the operational phase of the Proposed Development. A Traffic Impact Assessment has been undertaken by PMCE, the findings of which are presented in Chapter 14: Material Assets – Traffic & Transport of this EIAR.

The environmental impacts associated with the movement of HGVs have been incorporated into Chapter 9: Air Quality, Chapter 10: Climate and Chapter 11: Noise & Vibration.

3.4.8 Security

Primary access to the Site will be via the improved quarry entrance off the Donard Mountain Road local road. The entrance will be gated and secured when activities are not occurring within the quarry.

Soil embankments / berms and/or stock fencing will be present on all other boundaries of the Site. Records of checking, maintenance and repairs of the fence will be maintained. Safety / warning signage will be located at the Site entrance from the public road and includes contact details of the quarry operator. Signs will be maintained along the perimeter fence and access gate providing notice of the quarrying activities.

4 CONSIDERATION OF ALTERNATIVES

4.1 Introduction

The Planning and Development Regulations 2001 (as amended) specify the information to be contained within an Environment Impact Assessment Report ('EIAR'). Schedule 6, 1(d) specifies that an Environmental Impact Statement ('EIS') shall include '*An outline of the main alternatives studied by the developer and an indication of the main reasons for his or her choice taking into account the effects on the environment.*'

The EIA Directive 2014/52/EU requires an EIAR to contain:

> *'A description of the reasonable alternatives (for example, in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including comparison of the environmental effects.'*

The EPA's 2022 guidelines further state:

> *'The objective is for the developer to present a representative range of the practicable alternatives considered. The alternatives should be described with 'an indication of the main reasons for selecting the chosen option'. It is generally sufficient to provide a broad description of each main alternative and the key issues associated with each, showing how environmental considerations were taken into account in deciding on the selected. Option. A detailed assessment (or 'mini-EIA') of each alternative is not required.'*

Taking account of the above and considering the nature of the Proposed Development, this Chapter documents the alternatives to the Proposed Development that were considered, including the 'Do Nothing' scenario. This Chapter assesses the alternatives considered in the decision taken by the Applicant to extend the Quarry into the Site and outlines the following alternative considerations:

- Location; and,
- Design.

4.2 Alternative Location

The Applicant holds a landbank which encompasses the old quarry, and an agreement is in place with Mr. T. Stephenson for the use of additional greenfield lands to the east and south bordering this landbank. As discussed in Section 2 above, the locations of extractive industries are limited to where aggregates occur. As a finite resource, a proposed quarry or quarry extension must look at a range of environmental and commercial issues such as:

- The presence of the required rock;
- Contamination with other rock or soils;
- Its depth below the surface;
- Presence of groundwater;
- Access to necessary haulage routes;
- Proximity to markets; and,
- Historical unauthorised activities.

Within the local market area, there are limited sites that meet the above criteria.

The Site has proven rock quality and there are no existing zoning or planning infringements which would prevent excavation. The Site has good local connections into the primary road

network to allow easy servicing of west Wicklow and parts of Kildare and Carlow, along with relatively few sensitive receptors present on the haul route to reach regional and national roads. It is further noted several of the local dwellings are owned by persons connected to the Stephenson family.

The Applicant is constrained in seeking permissions on lands they have an interest in to complete both the regulatory planning and future operation upon. As such, this Site meets the requirement criteria.

The Applicant holds an interest on a landbank within the area which encompasses the old quarry (refer to blueline in Figure 1-2 above). To extend the quarry, the applicant will need to lease/purchase additional lands bordering this landbank.

Expansion to the north is constrained by the proximity of the land to residential dwellings and forestry. Potential lands to the west of the Site are constrained by the Donard Mountain Road, residential dwellings and a steeply falling topography indicative of reducing likely aggregate resources. Expansion to the west would also be constrained by the proximity of the lands to the Carrigower River.

However, as outlined in Section 2.2 above, the Applicant has the agreement to apply for development within the Site boundary which includes an agricultural field to the south and east of the old quarry. This land is a greenfield site with no previous planning history. The agricultural field is set back from the Donard Mountain Road and local residential dwellings, resulting in a viable extraction area for the Proposed Development.

Therefore, extending the quarry into the lands proposed is a viable option for the Applicant.

4.3 Alternative Design

Alternative design is looked at below under options on access to the site, options on extraction layout, and extraction processes.

4.3.1 Access

A review of the surrounding road network was undertaken as part of the assessment of alternative access points.

The Site is only accessible from the L-4320 (Donard Mountain Road) via the L-4321 off the N81 to the south or the L-4317 to the north.

Alternative access to the extension lands via the L8320 would involve the purchasing of additional lands to the south or southeast of the Site and the construction of a new Site entrance and access road. This would increase the distance HGVs would have to traverse and the increased likelihood of effects to nearby receptors from the Proposed Development.

As such, alternative access was not considered to be a preferred option.

The proposed access is a recommission/improvement of the existing access within the old quarry. The proposed access has been designed to avoid sharp turns and links into the old quarry directly.

4.3.2 Alternative Extraction

Reasonable alternative methods of extraction are limited. The phasing of the Proposed Development was looked at. This included the extension of the extraction area into lands on the eastern (higher elevation). However, as this increased the visibility of the Site, this option was less preferred.

Additionally, the dropping of the overall Site one bench prior to developing the second and subsequent benches was considered. Again, progression into the higher elevation lands at the earlier timelines was found to be less preferred from a visual perspective.

As a rock quarry, the need for wet processing was not considered as part of the Proposed Development.

Alternative extraction methods to blasting are limited and typically look to mechanical pressure. Such methods to remove blasting result in higher typical noise levels associated with the quarry and in smaller volumes of rock being separated from the quarry face. Based on the acoustics of the mechanical extraction methods, the industry standard of blasting utilising a Blast Specialist and complying with industry standards in environmental control of such blasts and HSE guidelines is the preferred option.

4.4 Alternative Processing

The aggregate processing / screening methods for developments at this scale can require the use of fixed or mobile screening equipment.

A fixed aggregate processing / screening plant can provide a large central processing area within the Site. This can allow the devolvement of storage areas and management of stockpiles around the central processing area. Potential noise / dust effects arising from the processing are centralised within the quarry void. However, a fixed processing plant requires a large area within the Site, which is installed on the ground and cannot be moved again. It often requires the construction of foundation and ancillary structures, i.e. silos, in the early stage. This leads to a generally larger investment and higher maintenance costs. Moreover, as the development reaches later stages of aggregate phasing, longer haul routes must be established for aggregates to be transported from the working face to the fixed processing plant.

Mobile aggregate processing / screening plants can be compact equipment that reduces the need for a large area to process. They are especially suitable for developments with complicated terrain. The high mobility makes the plant easily transported to other areas close to the quarry working face. Mobile aggregate processing / screening plant can be more economical, with the option of hybrid diesel and electricity power.

The use of mobile screening equipment was determined to be the most effective form of aggregate processing. Aggregate processing can be done close to the working face or transported on-site as needed.

4.5 Alternative Rehabilitation

A Restoration Plan for the Proposed Development includes the establishment of native species of vegetation along the landscaping berms and a proposed woodland area, which will have become well-established over the course of the Operational Phase.

Water management ponds developed during phase 1 will be maintained on-site as water features, while the main quarry floor will be covered in soils and re-sown as a species-rich grassland. The benches and quarry walls will be left to recolonise species and as a habitat for nesting species.

Some consideration was given to the restoration of the Site through the import of inert soil and stone material. However, quarries present an opportunity for biodiversity, including, solitary bees, rare floral plants and bird species such as peregrine falcon. It is considered that the habitats created once the extraction has ceased will form part of a mosaic of habitats which will support biodiversity. Therefore, the proposed restoration of the Site will be an appropriate end use of the land.

4.6 Alternative layout

The original plan proposed extending the current phases (1-3) and adding two additional phases (4 and 5) on a larger scale. Phase 4 was to involve directing operations toward the east of the Site, following a period of berm planting establishment for ca. 10 years.

Phase 5 would have extended operations towards the north and along the eastern boundary, making the completion of the Proposed Development.

This design layout had proposed a larger scale quarry with more intense operations, consisting of up to 275,00 tonnes extracted aggregate per annum.

Following the refusal, the project was reviewed in light of the concerns raised by both submissions on the file and the Council and the Proposed Development outlined in this application has been designed.

4.7 Alternative Uses Including a "Do-Nothing" Scenario

In addition to the main alternatives considered above, a "do-nothing" scenario was also considered.

The greenfield area of the Site is currently being used for agricultural purposes. The ecological surveys conducted on-site concluded that the Site is not of significant conservation value - refer to Chapter 6 for further details. Therefore, a "do-nothing" scenario would result in the Site persisting in its current state as agricultural grassland.

The failure to develop the Site will remove a viable resource that will facilitate further development in the Eastern region, while the resultant rehabilitated Site would provide productive ecological land after operations have ceased on-site.

It is envisaged that the final restored Site will offer suitable habitats for key species, which are known to occur locally but have limited sites for nesting. Specifically, the restoration design prioritises the nesting and savaging habitats for the Peregrine Falcon. To develop this suitable habitat on-site, a "do-nothing" scenario will not be sufficient.

5 POPULATION AND HUMAN HEALTH

5.1 Introduction

This chapter was prepared to provide a description and assessment of the likely effects of the Proposed Development in terms of population and human health.

The local or receiving population comprises a significant element of the overall environment. In carrying out developments, one of the principal concerns is that people should experience no diminution in their quality of life as a consequence of the Construction and Operational Phases of a development.

5.2 Methodology

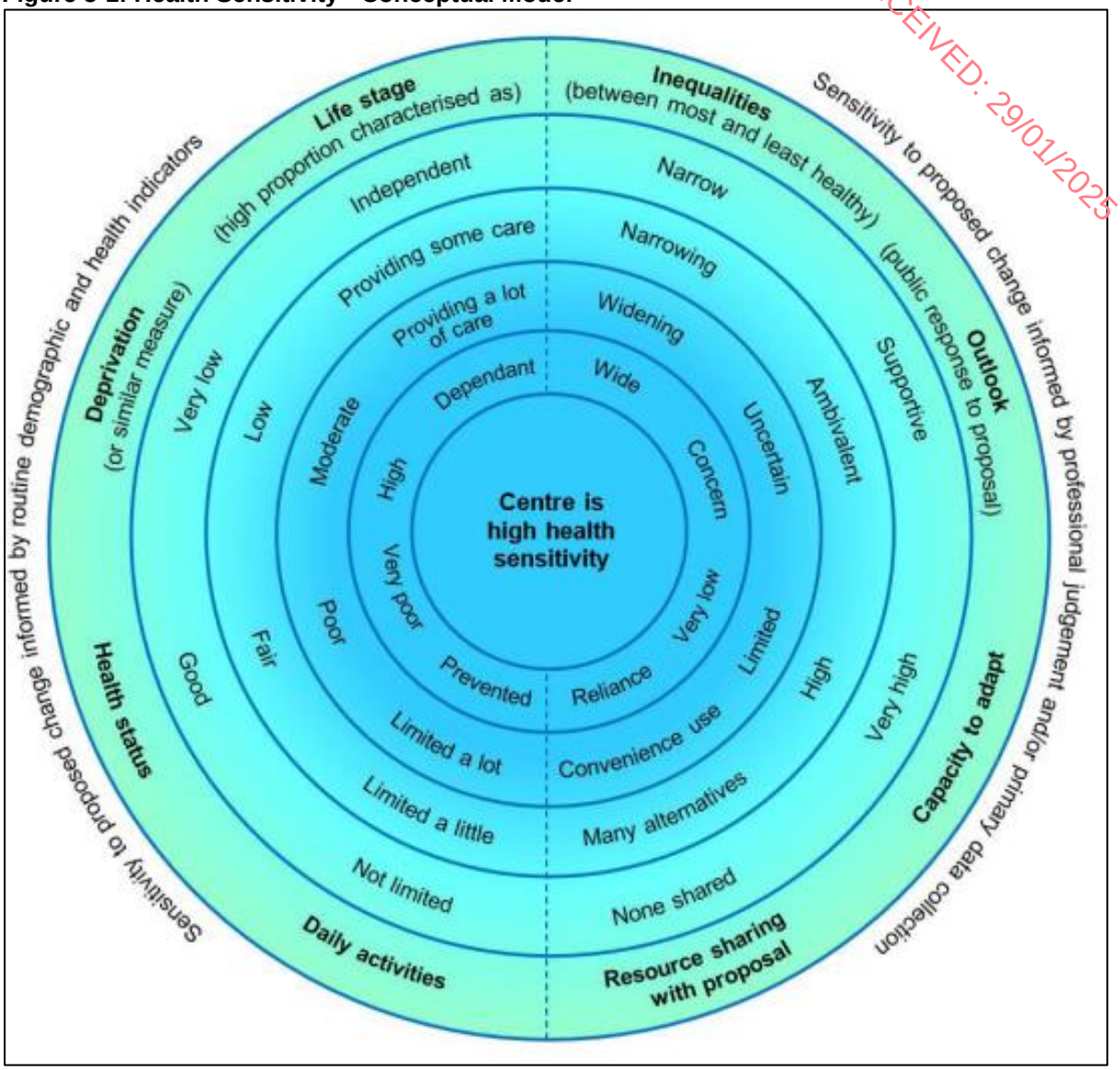
A desk-based study was carried out to characterise the environment in relation to human beings, including the receiving environment, change over time in population, employment levels and human health indicators.

This chapter has been prepared taking cognisance of the guidance set out in Chapter 1 and the following specific guidance documents:

- Guidance on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2022) [10];
- Health Impact Assessment Guidance (Institute of Public Health in Ireland ('IPHI'), 2021) [22];
- Health Impact Assessment in Planning, *Impact Assessment Outlook Journal, Vol 8* (Institute of Environmental Management and Assessment ('IEMA') Oct 2020) [23];
- Health in Environmental Impact Assessment; A Primer for a Proportionate Approach (IEMA, 2017) [24];
- Effective Scoping of Human Health in Environmental Impact Assessment (IEMA 2022) [25];
- Determining the Significance For Human Health in Environmental Impact Assessment (IEMA 2022) [26]; and,
- Human Health: Ensuring a high level of protection (International Association for Impact Assessment ('IAIA') and European Public Health Association ('EUPHA') 2020) [27].

Part Four of the IPHI guidance [22] was utilised to carry out an assessment of the sensitivity of the location population. The guidance is summarised in the Health and Safety Conceptual Model presented in Figure 5-1 below.

Figure 5-1: Health Sensitivity - Conceptual Model



Source: IPHI Guidance [22] **Part Four**

The health sensitivity of the population was assessed, taking into account the following factors:

- Life stage;
- Deprivation;
- Health Status;
- Daily Activities;
- Inequalities;
- Outlook towards the Proposed Development;
- Capacity of Health Services to Adapt; and,
- Resource sharing with the Proposed Development.

The findings are set out in Table 5-12 below.

The magnitude of impact was considered taking into account the following factors:

- Exposure;

- Scale;
- Duration;
- Frequency;
- Severity;
- Population Affected;
- Reversibility; and,
- Service Quality Implementation.

Population sensitivity and impact magnitude, along with other factors, including regulatory thresholds that are set out in accepted scientific guidance, were considered in determining the significance in accordance with the terminology set out in Section 1.9 above.

The following sources were consulted and used to determine both the sensitivity of the local population and the potential impact on them:

- Central Statistics Office ('CSO') Census Data 2011, 2016 and 2022 [28];
- Wicklow CDP 2022 – 2028 (including Donard Town Plan) [5]; and,
- COMAH Regulations 2015 (S.I. No. 209 of 2015).

Specific direct and indirect impacts which have the potential to impact on human health have been addressed in all subsequent chapters of the EIAR.

5.3 Receiving Environment

The receiving environment is presented below under the headings of population, small area statistics, surrounding land use, licensed activities locally, economic activity and human health.

5.3.1 Population

The CSO provides data on population and socio-economic aspects of the population at different levels for the entire state, at country level and for individual Electoral Districts ('ED') and Small Areas within each county.

The Site is located within the townlands of Deerpark and Donaghmore, within the ED of Donaghmore. The boundaries of this ED have not changed between the 2011, 2016 and 2022 censuses.

The closest settlements are:

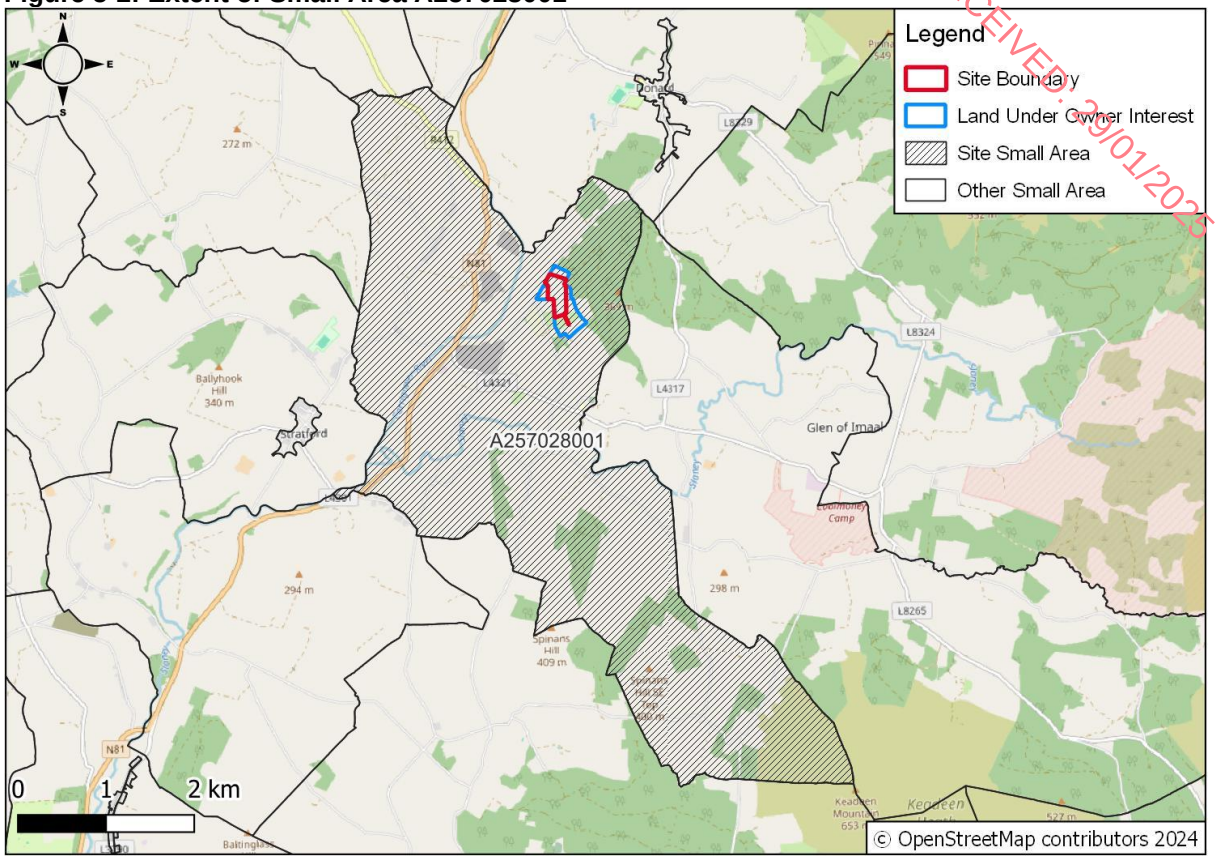
- Stratford-on-Slaney, situated ca. 3km southwest; and,
- Donard, situated ca. 2.6km north.

5.3.2 Small Area Population Statistics

"Small Areas" ('SA') were established before the 2011 census to give greater clarity and context to population trends. SA boundaries may change from census to census.

As of the 2022 Census, the Site is located in Small Area A257028001, see Figure 5-2 below for the SA boundary.

Figure 5-2: Extent of Small Area A257028001



In the 2016 and 2011 Censuses, the Site was in SA 257028001. The boundaries in each case have remained the same. The SA is synonymous with the ED and the population figures for each census are identical for the SA and the ED.

The SA boundaries for both Stratford and Donard changed considerably between the 2016 and 2022 censuses, and therefore, a direct population comparison is not possible.

Relevant population figures for the SA for the 2011, 2016 and 2022 censuses are shown in Table 5-1 below. The population figures for County Wicklow and Ireland are shown for context.

Table 5-1: Population Change Over Time

Area	Population Figures (Census)			% Change		
	2011	2016	2022	2011-2016	2016-2022	2011-2022
SA257028001	396	439	463	+10.86%	+5.47%	+16.92%
County Wicklow	136,640	142,425	155,851	+4.23%	+9.43%	+14.06%
Ireland – State	4,588,252	4,761,865	5,149,139	+3.78%	+8.13%	12.22%

For both the 2011-2016 and the 2011-2022 periods, the population of the immediate area around the Site has increased by more than the county and national percentage figures.

Table 5-2 below provides certain key statistics (drawn from the 2022 Census data) in relation to the local population with Small Area A2578001 and the local settlements. Figures for County Wicklow and Ireland are given for context.

Table 5-2: Population Statistics (2022)

Statistics Category	SA257028001	Stratford	Donard	Co. Wicklow	Ireland
Housing Information					
Registered Households	148	87	94	54,211	1,846,938
Unoccupied Dwellings (%)	8.75%	8.42%	16.81%	9.03%	12.57%
Population Figures					
2022 Population (%: M/F)	463 (50.32/49.68)	211 (44.08/55.92)	238 (48.74/51.26)	155,851 (49.13/50.87)	5,149,139 (49.42/50.58)
Age distribution 0 – 9 10 – 14 15 - 19 20 – 24 25 – 64 65 – 79 80+	 14.47% 9.29% 6.70% 5.83% 47.30% 14.04% 2.38%	 16.58% 5.21% 4.74% 3.79% 58.29% 9.00% 2.37%	 14.71% 5.88% 5.46% 3.36% 52.52% 15.97% 2.10%	 12.79% 7.90% 6.78% 5.10% 52.25% 11.82% 3.36%	 12.39% 7.27% 6.56% 5.96% 52.74% 11.56% 3.52%
Irish / UK nationality	96.11%	91.94%	97.48%	88.99%	84.52%
White Irish Ethnicity	92.44%	88.15%	93.70%	80.65%	75.61%
Irish Traveller Ethnicity	0.00%	0.00%	0.00%	0.57%	0.64%
Irish BAME / BAME	0.86%	0.0%	0.42%	3.00%	4.71%
No / Poor / Unknown levels of spoken English	0.86%	0.47%	1.68%	1.80%	2.45%
Household Statistics					
One Person	19.59%	32.18%	32.98%	20.42%	23.14%
Two or more Adults	72.97%	50.57%	55.32%	67.37%	65.48%
Single parent	2.03%	17.24%	11.70%	12.21%	11.38%
Owner Occupied	80.41%	65.52%	55.32%	70.97%	65.77%
Rented (Private Rent) (LA/HB Rent)^	14.19% (12.84%) (1.35%)	27.59% (6.90%) (20.69%)	37.23% (19.15%) (18.09%)	23.54% (13.26%) (10.28%)	27.48% (17.96%) (9.52%)
Central Heating (Electric/Gas)	95.95% (5.40%)	89.66% (2.30%)	94.68% (13.83%)	95.10% (45.61%)	93.85% (44.40%)

Statistics Category	SA257028001	Stratford	Donard	Co. Wicklow	Ireland
(Oil)	(69.59%)	(72.41%)	(56.38%)	(41.03%)	(38.79%)
(Coal/Wood/Peat)	(17.57%)	(14.94%)	(21.28%)	(6.14%)	(8.96%)
Water Supply	98.65%	100.00%	100.00%	98.51%	97.72%
(Mains)	(16.59%)	(94.25%)	(88.30%)	(79.74%)	(79.90%)
(Private)	(72.97%)	(1.15%)	(7.45%)	(16.23%)	(9.90%)
(Group)	(4.05%)	(4.60%)	(4.26%)	(2.25%)	(7.69%)
Sewerage	98.65%	100.00%	100.00%	98.24%	94.95%
(Mains)	(2.70%)	(78.16%)	(81.91%)	(72.82%)	(63.30%)
(Septic Tank)	(80.41%)	(19.54%)	(14.89%)	(20.92%)	(24.78%)
Health and Disability					
% with a disability (all ages)	17.71%	22.27%	22.27%	22.77%	21.55%
% caring for someone with disability	4.75%	4.74%	6.72%	5.90%	5.81%
% aged 15+ unable to work due to illness / disability	2.83%	6.67%	4.76%	4.23%	4.58%
% in Very Good / Good Health	92.66%	83.41%	85.71%	85.40%	82.89%
% in Fair Health	3.67%	10.90%	10.08%	8.23%	8.64%
% in Bad / Very Bad Health	1.51%	1.90%	2.52%	1.68%	1.74%

^LA/HB Rent – housing rented from Local Authority or Housing Body

5.3.2.1 Pobal Deprivation Statistics

The census statistics are used by Pobal on behalf of the Irish Government to develop deprivation indices. These are used to inform planning and policy decisions. Small Areas are placed into one of eight different categories describing their calculated level of deprivation, ranging from “Very Affluent” to “Extremely Disadvantaged”. Table 5-3 below details the Pobal statistics for SA257028001 and the two local settlements for 2022. County Wicklow figures are given for context.

Table 5-3: Deprivation Indices for Local Area

Indicator (2022)	SA257028001	Stratford	Donard	Co. Wicklow
Pobal HP Index	0.49	-4.58	-2.39	1.12
Pobal HP Description	Marginally Above Average	Marginally Below Average	Marginally Below Average	Marginally Above Average
Age dependency ratio (%)^	40.17%	33.18%	38.66%	35.88%

Indicator (2022)	SA257028001	Stratford	Donard	Co. Wicklow
Primary education only (%)#	12.00%	11.43%	7.41%	9.51%
Third level education (%)#	34.33%	28.57%	35.8%	43.59%
Male unemployment rate (%)*	2.44%	3.64%	8.06%	8.56%
Female unemployment rate (%)*	10.68%	12.96%	9.43%	8.11%

* The Pobal age dependency ratio is the percentage of persons aged 0-15 & >64 within the whole population. Higher ratios mean a greater dependency burden on the working age population. In 2022 the comparable figure for Ireland was 34.74% [29]

In the 2022 census, 11% of the population of Ireland aged 15+ had no formal education/primary education only and 48% had a third-level education [29]

^The national unemployment rate for (Q2) 2022 was 4.5% for males and 4.5% for females [30]

As the SA257028001 boundaries have not changed in recent years, it is possible to compare the Pobal indices from the 2011, 2016 and 2022 census sets; see Table 5-4 below.

Table 5-4: Changes in Deprivation Indices at SA257028001 (2011-2022)

Indicator (2022)	2011	2016	2022
Pobal HP Index	-3.40	-0.82	0.49
Pobal HP Description	Marginally Below Average	Marginally Below Average	Marginally Above Average
Age dependency ratio %	35.40%	37.36%	40.17%
Primary education only %	17.50%	12.00%	12.00%
Third level education %	21.00%	30.26%	34.33%
Male unemployment rate %	20.40%	11.48%	2.44%
Female unemployment rate %	16.70%	15.38%	10.68%

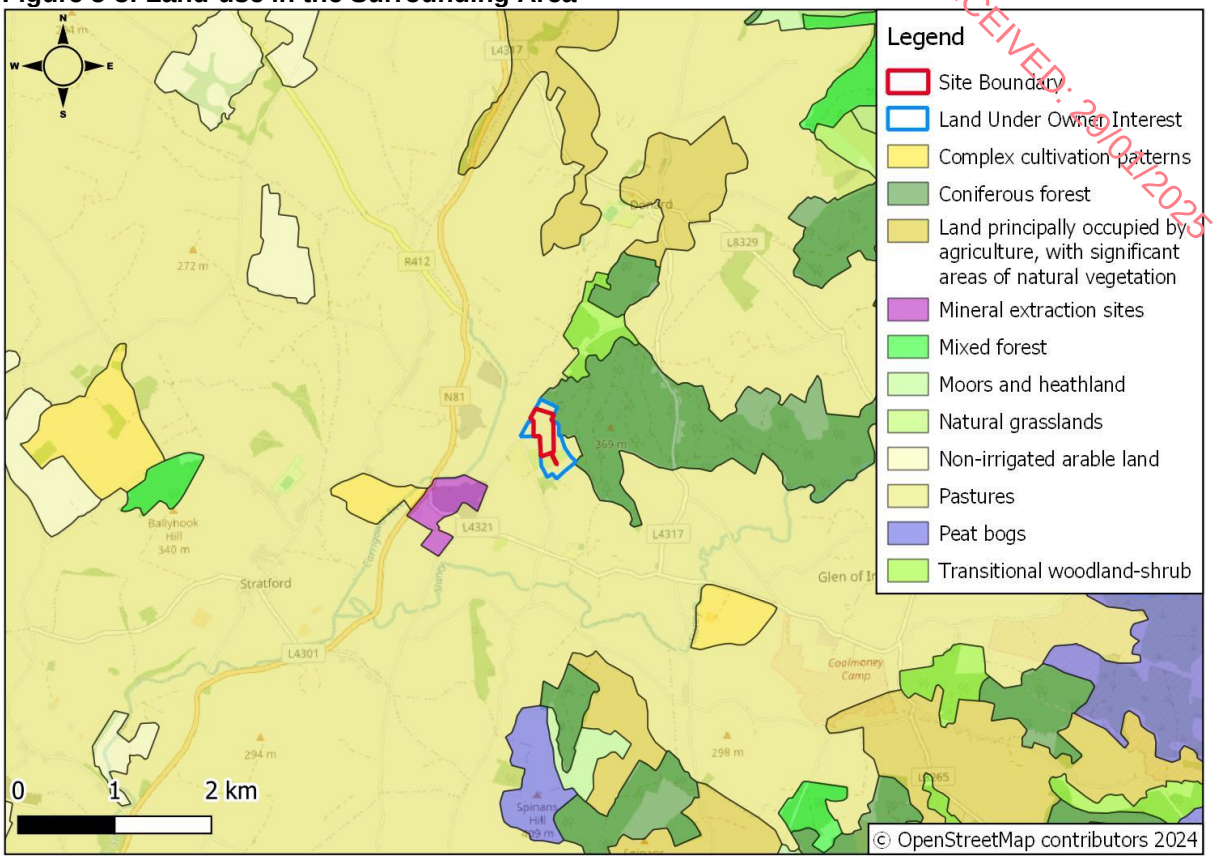
5.3.3 Surrounding Land Use

The land use is presented below under the headings of general land use, residential development and local quarries.

5.3.3.1 General Land Use

The surrounding land use in the area is pastoral and mixed agricultural use. The Donard Mountain Road will form the western and northwestern boundaries of the Site. To the north, the land use is pastoral with mixed agricultural use beyond. On the immediate northeast and east of the Site is an extensive coniferous plantation under the ownership of Coillte. Initial land use to the southeast is again coniferous plantation, with pastoral land beyond. There are former quarries ca1.2km to the southwest and 1.6km to the southeast. Beyond this, land use is largely pastoral and mixed agricultural. To the northwest are areas of arable land and to the south-southwest there is an area of peat bog. To the southeast are areas of mixed agricultural and natural vegetation. See Figure 5-3 below.

Figure 5-3: Land-use in the Surrounding Area



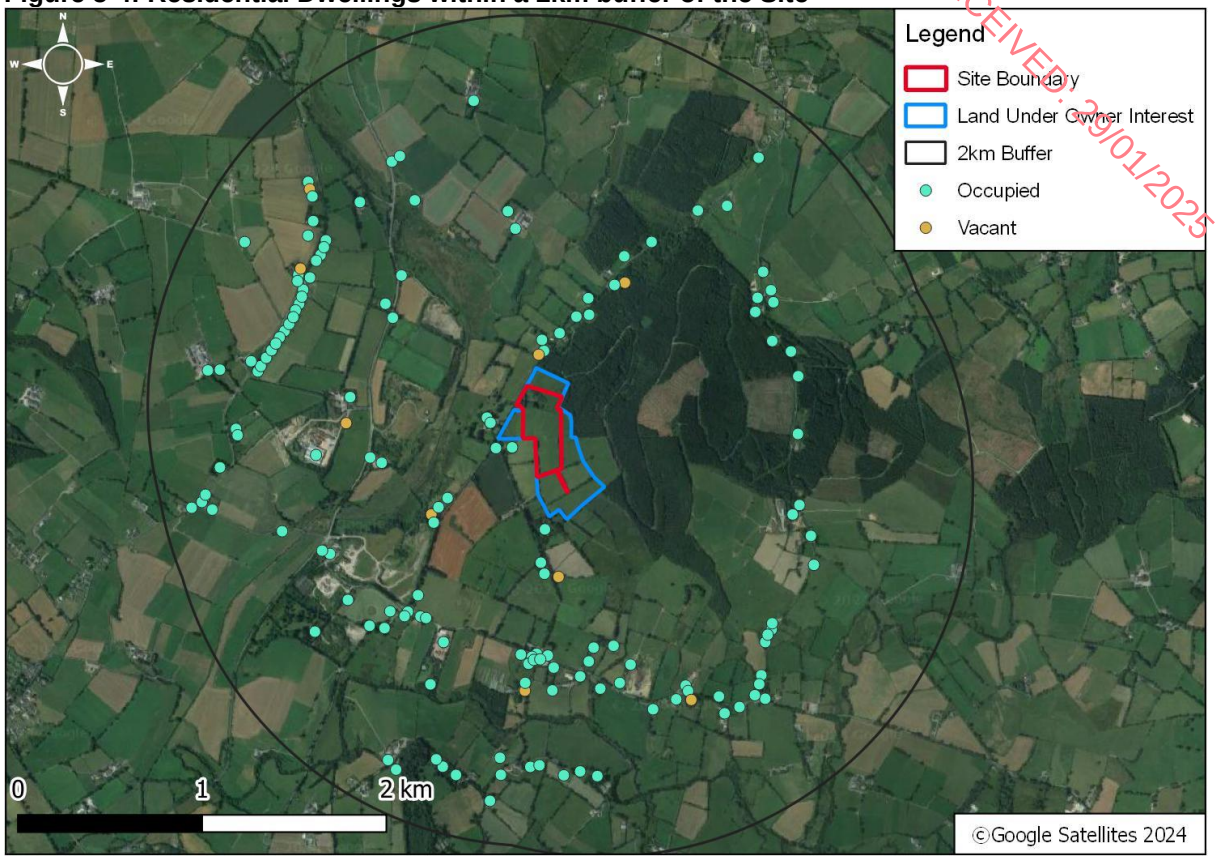
The plantation to the immediate northeast is a Coillte woodland featuring an extensive walking trail which will pass within 110m of the northeastern boundary of the Site.

5.3.3.2 Residential Development

Residential development in the vicinity of the Site consists of one-off housing, small clusters of housing and linear development along the local roads The closest residential property to the Site are two dwellings is directly outside the southwestern boundary ca. 85m from the Site.

The Old Rectory holiday accommodation complex lies on the western side of the Donard Mountain Road and is ca. 115m from the western Site boundary. In addition, there are several residential dwellings on the western side of the Donard Mountain Road, with three located within ca. 160m of the northern corner of the Site boundary and a further three within 650m of the southwestern corner of the Site. Figure 5-4 below presents residential dwellings within 1500m of the Site [31].

Figure 5-4: Residential Dwellings within a 2km buffer of the Site



The nearest settlements are:

- Donard, lying ca. 2.5km northeast along Donard Mountain Road and the L4317; and,
- Stratford, lying ca. 3.1km to the southwest. Stratford is accessed from the Site via the unnamed road to the N81 and the L4301, a total distance of 4.9km by road.

Donard includes a pre-school, a National School, and a GAA club, as well as a caravan / camping park within the village area.

Stratford includes a preschool, a National School and a GAA club.

Donoughmore National School is located just east of Castleruddery Crossroads, ca. 1km south of the Site boundary.

5.3.3.3 Local Quarries

There are several former quarries, according to County Wicklow's e-planning website [1] (see Figure 5-5 below).

Figure 5-5: S261 Former Quarries in the Vicinity of Site

QY15 / QY16

This would appear to refer to a disused quarry lying ca. 450m northwest of the Site boundary on the eastern side of the N81. This quarry, with a ca. 2.73ha area, had pre-1964 status. In 2021, a five-year planning permission (20/1117) was received from WCC for site restoration through the importation of inert soil and waste and the restoration of the quarry void.

QY25

This is a disused and remediated quarry of pre-1964 origins, located 3.5km north of the Site.

QY26

This is a former quarry known locally as O'Reilly's Pit, located on the western side of Donard Mountain Road ca. 400m west of the Proposed Development and slightly south of QY15 / 16. This was a 14.6ha site which operated as a quarry from pre-1964. The Site was still being worked in the 1970s, as some evidence exists of a grant of planning permission by WCC in 1978 for a portable gravel washing plant at the pit. However, although there was an appeal to ABP regarding a planning decision at this site in 1979, neither WCC nor ABP retain any records from this date.

At some point in the 1970s, the Site began to be used as an illegal landfill. In 1989, complaints were made to WCC regarding the illegal waste deposits, and in 2001, WCC closed the Site. On 20th January 2005, it was listed as QY26 on Wicklow Council's list of S261 quarry registrations. At this point, the Site was owned by Brownfield Restoration Ireland, who purchased the land after the waste activities had ceased. Brownfield applied for planning permission for an integrated waste management facility at the Site (052224). Planning was initially refused, but after an appeal to An Bord Pleanála (PL27.211913), permission was granted in August 2005. Following this, Brownfield Restoration Ireland Ltd applied for a Waste Management Licence (W0204) to excavate, treat, process and restore the waste and to deposit construction/demolition wastes and household wastes prior to remediating the land.

As part of the application process, WCC informed the EPA that Brownfield should be required to remediate the entire site. A waste licence was granted by the EPA in 2006 with the requirement that the Site be cleared of waste and contaminated soil within three years. WCC then took legal action against Brownfield for waste removal and remediation. Protracted legal proceedings followed, which have continued until the time of writing (May 2024). A draft remediation plan was before the Court in March 2023, but a Court order of 21st March 2023 provides for timelines continuing into January 2024.

On 29th April 2024, the EPA issued a public notice announcing that a Technical Amendment to the licence was to be made to incorporate the requirements of the Best Available Techniques conclusions on waste treatment.

QY53

This is a disused quarry to the east of Castleruddery Crossroads, ca. 1.3km southeast of the Site boundary. It was worked in 1999, as retention permission was granted at this point (991815). Permission to remediate was granted by WCC in 2017, following an appeal to ABP of an initial refusal (WCC Planning Ref. 17748, ABP ref PL27.249167). A planning application was made for permission for the importation, storing and processing (including crushing) of concrete in 2022 (WCC Planning Ref. 22643), but the application was refused on 10th July 2023 on the grounds of risk to public safety arising from traffic sightlines, the risk of materials being transferred on to the public road and the fact that aspects of the intended project would be contrary to Condition 3 of the earlier planning permission.

Stephenson S&G Pit

This is an expansive former sand and gravel pit (WCC planning permission 4618/79) located ca. 1km southwest of the Site boundary and encompassing both sides of the L4321. Extraction had ceased by April 2005, and the Site was not registered under S261. Since extraction ceased some of the Site has been remediated, with waste facilities permits allowing inert waste to be imported. The northern section of the site is accessed directly from the N81 and currently has a ten-year planning permission (as of 2022) for the importation of inert soil and stone for further site restoration in the northern section (Planning Ref. 201291).

The southern section of the site is accessed off the L4321 and has planning permission (Planning Refs.181363 and 2360182) for the importation and processing of concrete. These permissions were in the name of Mr R. Kavanagh.

O'Halloran Pit

This is a former quarry located ca. 1.6km southwest of the Site and immediately bordering the Stephenson S&G Pit. It was accessed from an unnamed local road which runs southwest from a junction with the L4321. The site had planning permission (Planning Refs. 072604 and 102917) for the importation of inert waste to restore the pit for agricultural use. The most recent permission expired in June 2014. However, recent aerial photos continue to show a clear area of bare ground.

Kells Minerals

This appears to have been a quarry located ca. 1.7km southwest of the Site and immediately bordering both the Stephenson and O'Halloran Pits. There are a total of five planning permissions (Planning Refs. 884281, 883947, 894794, 916804 and 917050) relating to the operation of a sand and gravel pit at this location, the earliest of which appear to relate to an existing operation and reference access from the N81. However, despite a ten-year permission being granted via planning reference 884281, the earliest available aerial photos (ca.1995) show little evidence of a quarry at this location. This would appear to be the current location of a flooring manufacturer (RH Wood Floors Ltd.).

5.3.4 Licensed Activities Close to Proposed Development

The EPA licensed sites within a 5km radius of the Site are outlined in Table 5-5 below.

Table 5-5: EPA Licensed Sites

Licence No.	Licence Type	Distance / Direction from Site
W0204-01	Industrial Emission Licence ('IEL')	400m West
W0181-01	Waste Management Licence ('WML')	2.5km Southeast
A0533-01	Waste Water Discharge Certificate of Authorisation ('WWDCA')	3.4 km Southwest
A0197-01	WWDCA	2.6km Northeast

There are no Local Authority-regulated Section 4 Discharge Consents within 5km of the Site.

5.3.4.1 Industrial Emissions Licences

The only IEL site within 4km is W0204-01, which is for a site located 400m west of the Proposed Development (see section 5.3.4 above). The licence was granted on 21st September 2006 for activity classes 11.4(a)(iii) Waste and 11.1.11.4(b)(ii). The permitted waste management activities under the current licence are:

- Composting;
- Mechanical-Biological Treatment;
- Shredding, crushing, baling and repackaging processes;
- C&D waste recovery;
- Landfilling of inert waste;
- Use of inert waste for landfill restoration;
- Storage of waste;
- Recovery of dry recyclables; and,
- Excavation of historically deposited wastes.

The maximum tonnage of historically deposited waste to be handled under W0204-01 at the time of writing (May 2024) is 180,000 tonnes/annum. The volume of waste to be imported is nil. The emission limit values ('ELVs') for W0204-01 are listed in Table 5-6 below.

Table 5-6: IEL Site W0204-01 ELVs

Parameter	Media	ELV
Landfill Gas	Air	Methane: 1.0% v/v CO2: 1.5% v/v
Dust	Air	350mg/m^2/day
Noise	Air	Daytime: 55 dB(A)LAeq Nighttime: 45 dB(A)LAeq

The W0204-01 site also has monitoring requirements in regard to landfill gas, leachate, dust levels and groundwater and surface water quality.

See section 5.3.3.3 (QY26) above for further information regarding the history of this IEL site.

5.3.4.2 Waste Management Licences

The only EPA-overseen waste management site within 5km of the Site is W0181-01. This licence is for a site located 2.4km southeast of the Proposed Development. The licence was granted on 30th October 2002, with the following permitted activities:

- Deposit on, in or under land;
- Surface impoundment, including placement of liquid or sludge discards into pits, pounds or lagoons;
- Biological treatment not referred to elsewhere in this Schedule[1] which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1 to 10 of this Schedule;
- Physico-chemical treatment not referred to elsewhere in this Schedule which results in final compounds which are disposed by means of any activity referred to in paragraphs 1 to 10 of this Schedule;
- Blending or mixing prior to submission to any activity referred to in a preceding paragraph of this Schedule;
- Repackaging prior to submission to any activity referred to in a preceding paragraph of this Schedule;
- Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule;
- Recycling or reclamation of organic substances which are not used as solvents;
- Recycling or reclamation of metals and metal compounds;
- Recycling or reclamation of other inorganic materials;
- Recovery of compounds used for pollution abatement;
- The treatment of any waste on land with a consequential benefit for an agricultural activity or ecological system; and,
- Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule[2].

The licence was for the cleanup of an unauthorised landfill containing ca. 10,000 tonnes of mixed construction, chemical, municipal, hospital and hazardous clinical wastes which had been placed within a disused sand and gravel pit in ca. 2001.

The restoration work was to be completed within twelve months of the date of issue of the licence. Waste was to be excavated in sections of up to 100m^2 at a time. No additional waste was to be accepted at the site for treatment. However, the site was permitted to import inert soil and other inert materials for restoration works.

The licence included quarterly monitoring requirements for surface water, ground water and leachate. The ELVs for W0181-01 are listed in Table 5-7 below.

[1] 'this Schedule' herewith means the Third Schedule of the Waste Management Act 1996

[2] 'this Schedule' herewith refers to the Fourth Schedule of the Waste Management Act 1996

Table 5-7: IEL Site W0181-01 ELVs

Parameter	Media	ELV
Landfill Gas	Air	Methane: 1.0% v/v CO_2: 1.5% v/v
Dust	Air	350mg/m^2/day
Noise	Air	Daytime: 55 dB(A)LAeq Nighttime: 45 dB(A)LAeq

On 30th November 2017, the EPA made a visit to the site to verify the findings of a 2014 exit audit. The EPA were satisfied by the condition of the site, and it can, therefore, be regarded as closed. However, as of the time of writing (May 2024), the licence itself has not been surrendered.

5.3.4.3 Wastewater Discharges

The two Wastewater Discharge Certificates of Authorisation ('WWDCAs') within 5km of the Site relate to discharges from residential agglomerations with a population equivalent of less than 500 persons. Both WWDCAs are operated by Uisce Éireann.

A0533-01 was granted on 14th November 2014 and is for foul water discharge from the Stratford wastewater treatment plant for Stratford-on-Slaney. The discharge (to the River Slaney at ITM 689325 693087) is monitored for Biochemical O2 Demand ('BOD'), Suspended Solids and Chemical Oxygen Demand ('COD') on a bi-annual basis.

A0197-01 was granted on 20th June 2011 and is for foul water discharge from Donard wastewater treatment plant. The discharge is monitored for BOD, Suspended Solids and COD on a bi-annual basis.

5.3.5 Economic Activity & Employment

5.3.5.1 Employment Opportunities in the Surrounding Area

Table 5-8 below shows the economic activity / employment figures for the working-age population (aged 15-64) for the Site and its locality. The County and State figures are provided for context. The student population of the area is below the national total figure. The proportion unable to work due to illness or disability is well below the national figure.

Table 5-8: Principal Economic Status (2022)

Sector	A257028001	Stratford	Donard	Co Wicklow	Ireland
In Work	60.06%	60.61%	55.56%	55.80%	56.09%
Unemployed (inc. looking for 1st job)	3.97%	5.45%	5.29%	5.08%	5.10%
Student	9.07%	4.24%	7.94%	10.64%	11.10%
Caring for home/family	9.35%	12.12%	7.41%	7.50%	6.58%
Retired	13.88%	10.91%	18.52%	16.01%	15.90%
Unable to work due to illness/disability	2.83%	6.67%	4.76%	4.23%	4.58%

Table 5-9 below shows the percentages of the employed population of the area around the Site who work within various industries. The County and State figures are given for context.

The high proportion of people employed in the agriculture / forestry / fishing sector reflects the rural nature of the area. A relatively high proportion of people within the area are employed within building and construction.

Table 5-9: Proportion of Working Population in Various Industries

Sector	A257028001	Stratford	Donard	Co Wicklow	Ireland
Agriculture, Forestry and Fisheries	19.34%	2.00%	8.57%	3.03%	3.54%
Building and Construction	10.38%	10.00%	7.62%	6.46%	5.80%
Commerce and Trade	17.45%	29.00%	26.67%	26.42%	23.82%
Manufacturing Industries	10.38%	8.00%	7.62%	9.13%	11.77%
Professional Services	19.34%	26.00%	22.86%	24.71%	24.48%
Public administration	6.60%	4.00%	6.67%	4.76%	5.67%
Transport and Communications	8.02%	8.00%	7.62%	9.74%	9.15%
Other	8.49%	13.00%	12.38%	15.75%	15.76%

Table 5-10 below shows the percentages of working-age people in work and unemployed who work or worked in various occupations. The high proportion of people who have skilled trade and process / plant / machinery occupations is an additional indicator of the rural nature of the wider area.

Table 5-10: Current or Former Occupation of Working Age Persons

Sector	A257028001	Stratford	Donard	Co Wicklow	Ireland
Administrative / Secretarial	13.06%	14.68%	7.89%	9.43%	9.20%
Associate Professional / Technical	6.76%	11.01%	14.04%	13.71%	11.71%
Caring, Leisure & Other Service	6.76%	11.01%	7.02%	7.64%	7.35%
Managers, Directors & Senior Officials	6.31%	7.34%	10.53%	9.68%	7.72%
Elementary Occupations	9.46%	10.09%	12.28%	7.50%	8.15%
Professional Occupations	16.67%	5.50%	17.54%	20.12%	20.31%
Process, Plant and Machine Operatives	10.81%	9.17%	0.88%	5.49%	6.91%
Sales and Customer Services	4.05%	12.84%	7.89%	5.71%	6.18%
Skilled Trades Occupations	23.87%	11.01%	18.42%	12.95%	12.57%
Not Stated	2.25%	7.34%	3.51%	7.79%	9.90%

Table 5-11 below shows the stated commuting method and duration for those in employment for the immediate Small Area. Figures for County Wicklow and Ireland are shown for context. The very low proportion of people commuting via public transport reflects the low availability of this method of transport. Proportionately low numbers of people commute on foot or via bicycle despite the above-average number of people with a relatively short commuting journey. This reflects the rural nature of the area, with very little in the way of public footpaths or lighting. The immediate Small Area has a proportionately large number of people working from home ('WFH'). A comparison with the 2016 census results shows that the WFH figure for the SA

increased from 18.71% [28] meaning that WFH was a strong local factor even prior to the national changes in commuting and working habits arising from the COVID-19 pandemic.

Table 5-11: Commuting Method and Journey Time

Stated Commuting Method	A257028001		Co Wicklow		Ireland	
	Work	Education	Work	Education	Work	Education
On Foot	3.90%	1.61%	6.60%	23.22%	8.36%	22.86%
Bicycle	0.00%	0.00%	1.05%	1.96%	2.85%	3.00%
Public Transport	0.49%	9.68%	8.17%	18.67%	8.45%	18.84%
Car Driver	61.46%	5.65%	57.57%	4.19%	56.32%	4.51%
Car Passenger	3.41%	80.65%	3.84%	51.00%	3.98%	49.82%
Van	8.78%	0.00%	6.99%	0.12%	6.87%	0.21%
Scooter/Motorcycle	0.49%	0.00%	0.41%	0.03%	0.40%	0.05%
Other (inc. lorry)	0.49%	0.00%	0.64%	0.11%	0.60%	0.11%
Mainly WFH	20.98%	2.42%	14.73%	0.69%	12.18%	0.60%
Commuting Time (for work and education)						
Time	**A257028001**		**Co Wicklow**		**Ireland**	
0 – 15 min	39.62%		32.42%		29.39%	
15 – 30 min	16.62%		25.22%		28.08%	
30 min – 1 hr	24.62%		26.81%		23.13%	
1hr +	16.15%		15.55%		8.67%	

Employment opportunities in the immediate area of the Site exist within the agricultural / forestry and construction trade sectors. There are also tourist attractions in the vicinity as well as typical rural industries such as saw-mills and studs. However, the low availability of public transport means that employment opportunities are more restricted for those without private transport.

5.3.5.2 Site Employment

At present, the Applicant has 15 employees and is recruiting.

5.3.6 Human Health

This section sets out the existing situation with regard to human health.

There are no records of accidents or incidents at the old quarry.

5.3.6.1 Sensitivity

The population of the immediate Small Area was considered in terms of the categories set out in Figure 5-1 above. The results are shown in Table 5-12 below.

Table 5-12: Population Sensitivity

Criteria	Classification	Sensitivity Level	Basis for Selected Classification
Life stage	Providing some care	Low	Although the age dependency ratio for the area is below the national average at 40.17% against the national average of 53.2%, it increased by 7.52% of the 2016 figure by the time of the 2022 census meaning that it is increasing faster than the national average, which increased by 0.95% of the 2016 figure. In addition, the proportion of children below the age of 15 is somewhat higher than the national proportion, and the % of the population aged 65+ is above the national average, meaning that the age dependency ratio will continue to rise.
Deprivation	Very Low	Negligible	The deprivation index is marginally above average.
Health status	Good	Negligible	Almost 93% of the population identify as having good or very good health, which is well above the national level of 83%.
Daily activities	Limited a little	Low	Less than 18% of the population identifies as having a disability, which is well below the national average of 21.55%. In addition, although the % of those caring for someone with a disability is only slightly below the national average, the % of people unable to work due to illness or disability is only 2.83%, well below the national average of 4.58%.
Inequalities	Narrowing	Low	The population is largely white Irish, with only a very small proportion of the population having low levels of spoken English. Although the % of people with only primary school education is above the national average and the % of people with a third-level education is below the national average, these figures have improved since the 2011 census, and the Pobal rating has changed from 'marginally below' to 'marginally above' the national average. In addition, the male unemployment figure is well below the national average, although the female unemployment figure is above the national average. The rate of homeownership is well above the national average and the % of people in Local Authority or Housing Body-supplied accommodation is well below the national average.
Outlook toward the proposal	Concern	High	There are residents extremely close to the Site boundary, including a holiday / glamping site. The initial planning application received fifteen submissions opposed to the Proposed Development on grounds of dust, noise, vibration, traffic, biodiversity impact and potential impact on private water supplies. The lack of completion of certain local historical remediations and the on-going legal conflict over the neighbouring former quarry (see section 5.3.4.2 above) may also indicate an increased likelihood of local opposition. Although there are numerous former quarries in the area, most of these have been closed for some time, and therefore, the Proposed Development is being seen as a new and intrusive development rather than part of an ongoing local pattern.
Capacity of health services to adapt	Very High	Negligible	Given the 5-8 proposed employees, who it is hoped will already live locally, the capacity of health services in the local area is highly likely to adapt to any small increased demand.

Criteria	Classification	Sensitivity Level	Basis for Selected Classification
Resource sharing with the proposal	None Shared	Negligible	The Proposed Development will not have high water or power needs. The Donard Mountain Road has no mains water, and all the immediate local residents rely on private water supply and septic tanks. The local road is a single-width rural road with no formal passing places. Traffic Impact is detailed in Chapter 14.
Overall Sensitivity	**High**		

The 'Overall Sensitivity' arises from the individual criteria sensitivity levels, and therefore the initial sensitivity finding is "High" due to the likely outlook of the local population towards the Proposed Development (the 2022 planning application received numerous objections, and it is likely that these objections will be raised again as they relate to a quarry development in principle at this location). However, as can be seen from Table 5-12 above, the sensitivity level of the local population, excluding the Outlook criteria, is generally negligible to low.

The outlook of the local population in regard to the Proposed Development will be a more negative one in the immediate locality of the Site, as concerns around noise, dust, traffic and the impact on the local biodiversity relate to concerns immediate to the Proposed Development. These concerns are addressed in the relevant specialist chapters of this EIAR.

Concerns regarding noise, dust and the local infrastructure will, by their nature, be lessened as the distance from the Proposed Development increases. Therefore, it is likely that as distance increases, the local outlook will move from 'concern' to 'uncertain' or 'ambivalent' (see Figure 5-1 above), which amends the wider Sensitivity Level from 'high' to 'medium' and to 'low' within the 1.5km study area shown in Figure 5-4 above.

In order to recognise the sensitivity of the local population in terms of outlook while also recognising that the sensitivity within the other classifications is markedly lower, it has been determined that the final sensitivity of the local population can be deemed to be "**Medium**".

5.4 Characteristics and Potential Effects of the Proposed Development

This section examines the potential effect on population and human health that may arise from the Proposed Development during the construction, operational and restoration phases and also examines the potential effects of the Proposed Development. This includes the potential for unplanned events.

5.4.1 Population

The population and employment estimates for both the construction and operational phases are detailed under the respective headings, Construction Phase and Operational Phase, below.

5.4.1.1 Construction Phase

The Construction Phase, as it relates to the old quarry, will involve the clearance of vegetation, the reduction of the floor level and preparation of the former face for controlled blasting. This will ready the area of the old quarry for utilisation as part of a modern working quarry.

Simultaneously, there will be a need to carry out works along the boundary with the local road, including the cutting back of vegetation and the creation of a number of passing bays to enable the quarry traffic to utilise the road. In addition, the quarry area adjacent to the local road will be improved to provide for a modern site entrance and the necessary infrastructure. This will include:

- Site office;
- Welfare facilities;
- Weighbridge;
- Wheelwash;
- Parking; and,
- Security fencing and gate.

To prepare the extension lands for extractive use, the over-burden and topsoil will need to be removed. This material will be utilised in the creation of the boundary embankments/berms, which will be planted with native species to stabilise the berm.

The Construction Phase will take place over twelve months and is estimated to employ two to three people. As the former quarry has been closed for a number of years and currently employs no members of staff, this will represent an increase in local employment opportunities.

5.4.1.2 Operational Phase

During the Operational Phase, which will last between 19–27 years (depending on the demand for aggregate), the Proposed Development will employ between five and eight people between the on-site employees and other off-site staff. There will also be indirect employment of maintenance personnel. This will represent an increase in local employment opportunities.

5.4.2 Human Health

The potential impacts on human health and safety are outlined below under the following headings: Construction Phase, Operational Phase, Restoration Phase, Safety, and Unplanned Events.

5.4.2.1 Construction Phase

The Construction Phase will involve the preparation of the old quarry via vegetation clearance, and the creation of supporting infrastructure in terms of site office, welfare and parking facilities, wheel wash and weighbridge and the installation of security fencing and gating.

As work expands into the fields to the north, east and south, there will be a need to remove the overburden and topsoil and utilise this to create screening berms. The berms themselves will need to be planted to ensure stabilisation. The removal of the over-burden and topsoil will be carried out on a phased basis in order to minimise the area of exposed ground.

The potential impacts on human health arising from the construction phase will be dust, noise, and vibration arising from clearance activities, as well as impacts arising from increased traffic levels. These impacts are examined in depth in the following specialist chapters:

- Chapter 9: Air Quality;
- Chapter 11: Acoustics; and,
- Chapter 14: Material Assets – Traffic and Transport.

5.4.2.2 Operational Phase

The operational phase will be the major phase of the Proposed Development. This will include:

- Drilling and blasting of quarry faces;
- Crushing and screening of aggregate;
- Stockpiling; and,
- Haulage from the Site.

There are no records of any reportable incidents or accidents occurring at the old quarry during its earlier period of operation.

The potential impacts on human health, particularly potential impacts on residents in the immediate locality, are addressed in detail in the specialist chapters below. The conclusions of those chapters are considered here in the context of the health sensitivity determined in section 5.3.6.1 above. Refer to the specific chapters for further details.

Chapter 6: Biodiversity

Although impacts on biodiversity do not have direct effects on human health, it is possible for there to be impacts on the quality of life of the local population. Several of the submissions made under the 2022 planning permission included local appreciation of and concern for the biodiversity within the quarry and the immediate area.

Taking into account the mitigation measures that will be implemented, it is considered that the impacts on ecology from the construction phase and operational phase of the Proposed Development will not be significant.

In the longer term, following the cessation of quarry activities at the Site and the successful implementation of the Restoration Plan, it is considered that the Proposed Development will not have a significant negative impact on biodiversity.

Given the 'medium' sensitivity of the population, the impact on the local population is, therefore, deemed to be not significant.

Chapter 8: Water

Although the Proposed Development will remove the aggregate within the extraction zone, the assessment of water has found that groundwater will continue to flow beneath the Site as the groundwater levels along the western boundary will be lower than the proposed pit floor. No likely significant effect on water supply or water quality is identified during the life of the Proposed Development. It is recommended that as part of the operation of the Proposed Development, water quality and groundwater levels will be recorded and reported to the Competent Authority, providing an improved and structured understanding of the local groundwater conditions to the public file over time.

Given the finding of the assessment regarding the effects of the Proposed Development on water supply and quality and the 'medium' sensitivity of the population, the impact on the local population is therefore deemed to be not significant.

Chapter 9: Air Quality

A risk assessment, as per international guidance, for the risk of dust arising during the quarrying works has been undertaken, along with an assessment of potential dust nuisance and health effects arising from the long-term activities of the Proposed Development. These assessments have found that the residual effects will be 'not significant' to the local population or habitats.

Given the 'medium' sensitivity of the population, the impact on the local population is therefore deemed to be not significant.

Chapter 10: Climate

A detailed review of the proposed operations of the Proposed Development in line with Ireland's climate targets has found that the effects of greenhouse gas ('GHG') emissions will be 'not significant' based on the size and type of the development. The effects of climate on the Proposed Development will be 'not significant' based on the results of the climate change risk assessment.

Given the 'medium' sensitivity of the population, the impact on the local population is therefore deemed to be not significant.

Chapter 11: Acoustics

During normal operations detailed acoustic modelling of the Proposed Development has found that the levels of noise associated with the operation will be below standard EPA & CF limit (55dB) from quarries for noise at all properties. Similarly, normal operations at the Site have been found to be neutral.

It is recognised that as a rock quarry, blasting will be an integral aspect of the operation. These events will be tightly controlled and managed, with best practice in terms of local community notification and restrictions to the time of blasting, all committed to by the Applicant.

The effect of the Proposed Development in terms of noise and vibration has been determined to be neutral. Given the 'medium' sensitivity of the population, the impact on the local population is therefore deemed to be not significant.

Chapter 12: Landscape and Visual

The Site sits on a sloped field with a high ridge to the east. A phased approach to the Proposed Development and an initial stage of boundary berm placement and planting with trees will allow for the Proposed Development to be softened and limit the views of the future extracted face. Photomontages showing the Proposed Development from key viewpoints in the locality have been undertaken, and no likely significant effect has been found.

Given the 'medium' sensitivity of the population, the impact on the local population is therefore deemed to be not significant.

Chapter 13: Cultural Heritage

A detailed assessment of the Site and Proposed Development has been undertaken and found that the setting of structure No. 3, the former Rectory, could potentially be subject to a worst-case, negative, significant, and long-term effect while the quarry is in operation. However, this will be mitigated by the proposed western screening berm, which reduces the effects to not likely significant effects arising either directly or indirectly within the Site or the vicinity of the Site.

Given the 'medium' sensitivity of the population, the impact on the local population is therefore deemed to be not significant.

Chapter 14: Material Assets – Traffic and Transport

A detailed traffic model on the junctions between the Site entrance and the national road have found all junctions will continue to operate within design parameters. Although the Donard Mountain Road is narrow, it is lightly trafficked and options to install pass-by lanes are present to accommodate for occurrences of meeting traffic.

The assessment found that in relation to traffic on the surrounding road environment, effects from the Proposed Development are deemed to be imperceptible.

Given the 'medium' sensitivity of the population, the impact on the local population is deemed to be not significant to imperceptible.

5.4.2.3 Restoration Phase

A Restoration Plan for the Proposed Development will be submitted as part of this planning application. This plan will allow for the establishment of native species of vegetation along the landscaping berms, which will have become well-established over the course of the Operational Phase.

The final total area planted will exceed the area of vegetation removed to facilitate the quarry works.

The quarry floor will be allowed to naturally regenerate over time, while the restoration plan will permit a mixture of habitats along the benches and quarry faces and boundaries to allow a range of species to populate the remediated site.

5.4.2.4 Safety

The Health and Safety Authority ('HAS') views the quarrying industry as a high-risk sector. All safety measures outlined within the Safe Quarry - Guidelines to the Safety, Health and Welfare at Work (Quarry) Regulations 2008, along with the guidelines outlined within the Safe Quarry A Guide for Quarry Workers, 2019 will be followed.

The Site will include fencing to prevent the ingress of unauthorised personnel.

The use of on-site explosives to break the quarry faces for processing will be carried out in a carefully controlled manner and be undertaken solely by expert specialist companies. No explosives will be stored on-site. Before and after the blast events, the area around the blast point will be cleared of all personnel.

The European Union's Safety and Health Commission for the Mining and other Extractive Industries produced Guidance on the Safe Use of Explosives in Quarries (2001) and this is the guidance document utilised by the HSA to determine safe working practices within quarries. Extraction activities at the Proposed Development will take cognisance of this guidance document.

5.4.2.5 Unplanned Events

As with all similar developments, there is some risk that accidents or disasters outside the operator's control could result in a risk to the environment. Such incidents could theoretically include fire, flood, explosions and oil/fuel spills arising from vehicle accidents. In practice, these incidents are unlikely due to the following control measures:

- Fire: the nature of the Site means that there are very few on-site combustible materials or sources of ignition, as the Site's plant and equipment will be maintained to a high standard of safety;
- Flood: the development is flood resilient, with the majority of the Site empty and all plant being mobile. Measures to manage water on-site are implemented and outlined in Chapter 8;
- Explosion: As stated in section 5.4.2.4 above, on-site blasting operations will be planned and carried out by experts, and no explosives will be stored on-site; and,
- Vehicular Accidents – The Site will ensure all drivers are fully qualified and trained and that on-site HSA guidelines are followed in relation to quarries. Mobile plant will only be moved by trained operatives and staff vehicles will not be permitted into the extractive areas of the Site.

5.5 Proposed Mitigation Measures and/or Factors

Mitigation measures for the potential effects arising from the Proposed Development which may impact on human health are considered in detail within the following chapters:

- Chapter 7: Land Use, Soils and Geology;
- Chapter 8: Water;
- Chapter 9: Air Quality;
- Chapter 10: Climate;
- Chapter 11: Noise and Vibration;
- Chapter 12: Landscape and Visual; and,

- Chapter 14: Material Assets – Traffic and Transport.

5.6 Cumulative and In-Combination Impacts

The Site will, in combination with other businesses/enterprises in the area, support local employment and the local economy.

As outlined in section 5.3.3.3 above, the Site does not adjoin or lie in proximity to other similar developments.

The QY26 (W0204-01) site is a potential cumulative source of dust and noise, given its close proximity to the Site. The impact on dust levels is assessed in section 9.3.4 below. The cumulative impact of dust is examined in section 9.6.1 below. The cumulative impact of noise is examined in section 11.6 below.

5.7 Interactions with other Environmental Attributes

Population and human health have the potential to be impacted positively or negatively by several environmental issues. The relevant interactions with other key environmental factors are set out in section 5.4.2.2 above and are examined more extensively in Chapters 6-14.

5.8 Indirect Effects

The Proposed Development will have a slight positive long-term effect on local employment, arising from the requirements of machinery maintenance and upkeep, deliveries and professional services such as:

- Health and safety specialists;
- Refuelling;
- Blast specialists;
- Environmental monitoring personnel; and,
- Quality control personnel.

5.9 Residual Effects

The assessment has found the overall effect to be long term, and not significant in terms of human health.

The effects on the local and regional aggregate supply can be seen as moderate, positive and long-term.

The residual effects in terms of human health within the local population will be long-term and slight to moderate.

5.10 Monitoring

Monitoring requirements are discussed within the individual specialist chapters below.

5.11 Reinstatement

See sections 3.3.3 and 5.4.2.3 above.

5.12 Difficulties Encountered in Compiling this Information

No difficulties were encountered.

6 BIODIVERSITY

6.1 Introduction

This Chapter of the EIAR details the methods and results of a desk study and field surveys undertaken to establish the baseline ecological status of the Site and its immediate surroundings and assess the potential effects of the Proposed Development.

A detailed ecological appraisal has been carried out by a fully qualified and experienced MOR Environmental Ecologist in line with *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (2018 and revisions) . In addition, an assessment of potential impacts on European sites was also undertaken and is presented in the Natura Impact Statement ('NIS') submitted as part of the overall planning application.

6.2 Methodology

The following chapter presents the methods and findings from desk studies and field surveys that establish the baseline ecological status of the Site and its surroundings, assessing the potential impacts of the Proposed Development.

6.2.1 Relevant Guidance

The following standards and guidance documents were utilised to characterise the baseline conditions of the Site, the assessment of potential effects to biodiversity and the appropriate mitigation measures required:

- Chartered Institute of Ecology and Environmental Management ('CIEEM'), *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (2018 and revisions) ;
- National Road Authority ('NRA'), *'Guidelines for Assessment of Ecological Impacts of National Roads Schemes'* ;
- Guidelines for the Protection of Biodiversity within the Extractive Industry [13];
- Chapter 23 Reptiles in *Handbook of Biodiversity Methods: Survey Evaluation and Monitoring* ;
- Joint Nature Conservation Committee ('JNCC'), *Herptofauna Worker's Manual* ;
- JNCC, *Common Standards Monitoring Guidance for Reptiles and Amphibians* ;
- *Survey Protocols for British Herpetofauna* ;
- Froglife, *Reptile Survey: An introduction of planning, conducting and interpreting surveys for snake and lizard conservation ;*
- NRA, now TII, *Guidelines for Assessment of Ecological Impacts of National Road Schemes* .
- *Fossitt's Guide to Habitats in Ireland* ;
- Ireland Red List No. 10: Vascular Plants ;
- Heritage Council's *'Best Practice Guidance for Habitat Survey & Mapping'* ;
- NRA, '*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes' ;*
- Scottish Badgers, *'Surveying for Badgers: Good Practice Guidelines,' ;*
- The Mammal Society, *'Surveying Badgers,'* ;
- NRA, *'Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes' ;*

- *Bat Surveys for Professional Ecologists - Good Practice Guidelines* (3rd ed.). London: The Bat Conservation Trust ;
- National Parks and Wildlife Service ('NPWS'), 'A Conservation Plan for Irish Vesper Bats' Irish Wildlife Manual No.20 ;
- *Raptors: A Field Guide for Surveys and Monitoring* ;
- British Trust of Ornithology ('BTO') - *A Field Guide to Monitoring Nests ;*
- Common Bird Census ('CBC') *in Bird Monitoring Methods ;*
- C741 – '*Environmental Good Practice on Site (4th Edition)'* ;
- NRA, *'Guidance for the Treatment of Badgers Prior to the Construction of National Road Schemes*' ; and,
- NRA, '*Guidance on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads* .

6.2.2 Non-Statutory Consultation

As described in Section 1.10, non-statutory consultation was undertaken, and a response was received from Inland Fisheries Ireland ('IFI'). This response noted the proximity of Carrigower River to the Site and raised concerns over the protection of this salmonid waterbody. IFI also noted that the Carrigower River is a tributary of Slaney River, which is a SAC for multiple aquatic species. Potential effects on aquatic species within Carrigower River have been considered in preparing this assessment. Please see Appendix 1-2 for the full response submission.

A pre-planning consultation meeting with the Development Applications Unit ('DAU') of the NPWS was held on 26th July 2022. This meeting involved a discussion around peregrine falcons, vulnerable periods of disturbance and the potential to enhance opportunities for breeding peregrine falcon on-site. The NPWS recommended the use of an ornithological consultant with specific expertise in raptors / birds of prey. Dr. Marc Ruddock was recommended for this purpose. All comments raised during this meeting were taken into account when preparing this assessment.

6.2.3 Desk Study

As a starting point, the desk study focused on identifying European designated sites within a 15km radius of the Site, nationally designated sites within a 5km radius of the Site and records of legally protected and notable species within 2km of the Site.

The area for which biological data were collected was based on an assessment of the ecological zone of influence of the Site (i.e. the area that could be affected by the scheme within which there is the potential for significant ecological effects).

The following literature sources were consulted as part of the desktop study for ecological information:

- The NPWS website was consulted with regard to the most up-to-date detail on conservation objectives for the European sites relevant to this assessment ;
- The National Biodiversity Data Centre Mapping tool ('NBDC') website was consulted with regard to species distributions [64];
- The Environmental Protection Agency ('EPA') Maps website was consulted to obtain details about watercourses in the vicinity of the Site ;
- The Wicklow County Council Planning Portal was consulted to obtain details about existing / Proposed Developments in the vicinity of the Site [1];

- The Environmental Report prepared by Earth Science Partnership Ire. Ltd. in December 2021 as part of the previous planning application ; and,
- The Raptor Report prepared by Cian Cardiff in June 2022 as part of the previous planning application .

6.2.4 Field Survey

The following section outlines the methodologies used to evaluate the extent and quality of habitats present on-site and the importance of the on-site habitats for protected or notable species.

6.2.4.1 Habitat Survey

To establish baseline conditions at the Site, a field survey was undertaken on 8th June 2023 by two suitably qualified MOR Environmental Ecologists to assess the extent and quality of habitats present on-site. This field-based assessment was extended to cover the full lands under owner interest. The habitat survey was undertaken using the Fossitt's '*A Guide to Habitats in Ireland,'* in line with the Heritage Council's '*Best Practice Guidance for Habitat Survey & Mapping'* .

The assessment was extended to also identify the potential for these habitats to support other features of nature conservation importance, such as species afforded legal protection under either Irish or European legislation. Based on the habitats present additional species-specific surveys were also undertaken for bats, breeding birds and reptiles.

An updated field survey was undertaken on 29th October 2024 to assess any potential changes on-site. This field survey was also extended to assess the potential habitats of note outside of the Site boundary and lands under owner interest, including the pond where water pumped into the land drain will travel and the habitats along the proposed passing bays and widening along the haul route.

6.2.4.2 Protected / Notable Species Survey

The methodologies used to establish the presence / potential presence of faunal species are summarised below. These survey methodologies relate to the species / biological taxa that both the desk study and habitat survey indicated could occur within the Site.

<u>Flora</u>

The Site was assessed for the presence of notable / protected flora species in accordance with the following:

- Flora (Protection) Order 2022 (S.I. No. 235/2022); and,
- Ireland Red List No. 10: Vascular Plants .

<u>Amphibians</u>

The Site was assessed for its potential to provide sheltering, foraging and breeding habitat for amphibians in line with the NRA, now TII, *'Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*,' . These include water bodies suitable for egg-laying and terrestrial habitats comprising open areas with mixed-height vegetation, such as heathland, rough grassland, open scrub or water body margins. Suitable, well-drained and frost-free areas are needed to enable amphibians to survive the winter.

<u>Badgers</u>

The full lands under owner interest and an additional 150m buffer within the adjacent Coillte Woodland were walked in relation to badgers. The survey aimed to identify and examine areas where badgers (*Meles meles*) might occur by noting any evidence of badger activity. This included:

- Mammal paths;
- Badger hairs caught in sett entrances / fences / vegetation;
- Paw prints;
- Evidence of foraging (usually in the form of 'snuffle holes');
- Badger Scat (isolated badger droppings);
- Latrines (shallow pits / holes occurring together comprised of exposed badger droppings); and,
- Badger setts.

The field survey was conducted in line with the following relevant guidance for badger:

- Scottish Badgers, 'Surveying for Badgers: Good Practice Guidelines,';
- The Mammal Society, 'Surveying Badgers,' ; and,
- NRA, now TII, 'Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes,' .

Bats

An initial assessment was carried out during the habitat survey of the suitability of the habitats within and bordering the Site to support bat roosting, foraging, and commuting.

Mature trees were inspected for evidence of cavities, splits, cracks, loose bark, and dense and woody ivy (*Hedera helix*) growth that could be used by bats for roosting.

Following the identification of treelines suitable for foraging and commuting bats and scrub and woodland habitats suitable for foraging bats, targeted bat surveys were undertaken on 19th July and 17th August 2023. These surveys comprised of one dusk survey and one dawn survey.

The bat surveys were conducted in line with the following relevant guidance for bats:

- NRA, now TII, '*Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes' ;*
- NPWS, 'A Conservation Plan for Irish Vesper Bats' Irish Wildlife Manual No.20 ; and,
- *Bat Surveys for Professional Ecologists - Good Practice Guidelines* (3rd ed.). London: The Bat Conservation Trust .

A full bat report has been prepared by MOR Environmental which details the methodology followed during these surveys, the results and the proposed mitigation in relation to bats. The bat report is attached as Appendix 6-2 and should be read in conjunction with this chapter of the EIAR.

Birds

The Site was assessed for its potential to provide nesting habitat for breeding birds or to support important assemblages of birds of rare or notable species. Any activity and potential nesting habitats were noted.

After the initial assessment of the Site, it was deemed necessary to undertake breeding bird transect surveys. The breeding bird transect surveys were undertaken on 13th July, 31st July and 11th August 2023 by one suitability qualified MOR Environmental Ecologist. The breeding bird surveys were conducted in line with the methodology described in:

- BTO, '*A Field Guide to Monitoring Nests'* ; and,
- Common Bird Census in '*Bird Monitoring Methods' .*

A full bird report has been prepared by MOR Environmental which details the full survey methodologies, the survey results and the proposed mitigation for birds. The bird report is attached as Appendix 6-3 and should be read in conjunction with this chapter of the EIAR.

Raptor surveys were undertaken for the Site by Dr. Marc Ruddock and Mr James Irons of Bird Surveyors Ltd., refer to 6.2.5 for further details.

Reptiles

Suitable habitat for reptiles was identified within the northern portion of the Site and wider lands under owner interest. These habitats comprised of open areas in between bracken and scrub vegetation and stone walls.

As potential reptile habitat was identified during the initial walkover of the Site, presence/absence surveys were undertaken. The surveys were conducted in line with the following guidance documents:

- Chapter 23 Reptiles in *Handbook of Biodiversity Methods: Survey Evaluation and Monitoring* ;
- JNCC, *Herptofauna Worker's Manual* ;
- JNCC, *Common Standards Monitoring Guidance for Reptiles and Amphibians* ;
- *Survey Protocols for British Herpetofauna* ;
- Froglife, *Reptile Survey: An introduction of planning, conducting and interpreting surveys for snake and lizard conservation ;* and,
- NRA, now TII, *Guidelines for Assessment of Ecological Impacts of National Road Schemes* .

A full reptile report has been prepared by MOR Environmental which details the full survey methodologies, the survey results and the proposed mitigation for reptiles. This reptile report is attached as Appendix 6-5 and should be read in conjunction with this chapter of the EIAR.

Invasive species

The Site was visually assessed for the presence of any noxious/invasive species that are regulated under Regulation 16(1) and 16(2) of the European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024) [68] such as Japanese knotweed (*Reynoutria japonica*) and Himalayan balsam (*Impatiens glandulifera*).

The Site was also assessed for the presence of non-regulated invasive species that have the potential to impact local biodiversity.

Other species

In addition, an assessment was carried out of the potential for the Site to support any other species considered to be of value for biodiversity, including those that were identified as occurring locally by the desktop study.

6.2.4.3 Survey Constraints

No survey constraints were encountered.

6.2.5 External Field Surveys

6.2.5.1 Raptor Survey

Three surveys were conducted on the 26th June 2023, 15th July 2023 and 9th August 2023 by ornithologists Dr. Marc Ruddock, Mr. Douglas Ruddock and Mr. James Irons to establish whether the Site was occupied by Peregrines. The surveys focused on the Site boundary but included a survey of alternative nest areas within 5km.

A raptor report has been prepared which details the full survey methodologies, the survey results and the proposed mitigation for raptors. This raptor report is attached as Appendix 6-4 and should be read in conjunction with this chapter of the EIAR.

Updated surveys were also undertaken by the same external consultants, with the addition of Mr Alan Ferguson on 11th June 2024, 12th June 2024 and 9th July 2024. The 2024 surveys focused only on raptors.

6.2.6 Assessment Methodology

The starting point for the assessment was to undertake a scoping exercise for those ecological receptors that would require further consideration as part of the assessment. This involved differentiating the biodiversity receptors (i.e. designated sites, habitats and species populations) that could be significantly affected by the Proposed Development.

The approach that was used for determining which receptors have the potential to be significantly affected by the Proposed Development involved using baseline data collected through the desk study (2km away for protected species, 15km for European sites and 5km for nationally protected sites) and field surveys for the Site and to determine:

- Which, if any, of the species or habitats recorded are legally protected or controlled (see Box 1); and,
- Which, if any, sites, areas of habitat or species recorded are of importance for biodiversity conservation.

The next stage of the assessment was to determine whether the identified receptors are of sufficient biodiversity value that an impact upon them would be of potential significance in terms of this EIAR. In this regard:

- Biodiversity conservation value relates to the quality and/or size of sites or habitats, or the size of species' populations; and,
- Potential significance means that the effect could be of sufficient concern or, for positive effects, of such substantial benefit that it could be material to influencing the planning decision.

Those receptors that have been identified as having sufficient value, where an impact upon them could be of potential significance, have been taken forward for further consideration. Legally protected species were also considered further. This involved:

- Identifying, for each receptor, any significant impact that is likely to be caused by the Proposed Development, which has the potential to lead to a significant effect and/or to contravene relevant legislation;
- Determining the area within which the likely impacts would cause a potentially significant impact on the identified receptor and/or could contravene relevant legislation (ecological zone of influence); and,
- If the receptor occurs or is likely to occur within the zone of influence and it is concluded that the receptor could be significantly affected and/or the relevant legislation contravened, the receptor would be subject to further assessment.

6.2.7 Evaluation of the Conservation Importance of the Site

In terms of biodiversity conservation value, identified receptors have been valued using the National Roads Authority Scheme , using the following scale:

- International importance;
- National importance;
- County importance (or vice-county in the case of plant or insect species);

- Local importance (higher value); and,
- Local importance (lower value).

6.2.8 Legal Protections

Within Ireland, several sites of international or national importance to nature conservation, as well as many species of animals and plants are afforded some degree of legal protection. Details are provided in Box 1 below.

A study of biodiversity-related planning policy at the national and local level has been undertaken for the Site and locality to highlight any potential conflicts with the relevant legislation and guidance documents.

Box 1 Designated Wildlife Sites and Protected and Otherwise Notable Habitats and Species

The National Parks and Wildlife Service ('NPWS') notifies sites in Ireland that are of international or national importance for nature conservation (although some sites that are of national importance for certain species have not been so designated).

Internationally important sites may also be designated as:

- Special Areas of Conservation ('SACs') and Candidate Special Area of Conservation ('cSACs'): the legal requirements relating to the designation and management of SACs in Ireland are set out in the European Communities (Birds and Natural Habitats) Regulations 2011-2021;
- Special Protection Areas ('SPAs') and candidate Special Protected Areas ('cSPAs'): strictly protected sites classified in accordance with Article 4 of the EC Directive on the Conservation of Wild Birds (2009/147/EC), also known as the Birds Directive; and,
- Ramsar sites: wetlands of international importance designated under the Ramsar Convention, to which Ireland is a signatory.

Other statutory site designations relating to nature conservation are:

- Natural Heritage Areas ('NHAs'): these represent examples of some of the most important natural and semi-natural terrestrial and coastal habitats in the country and are afforded protection under the Wildlife (Amendment) Act 2000. NHAs are legally protected from damage and receive protection from the date they are formally proposed for designation; and,
- Proposed Natural Heritage Areas ('pNHAs'): these sites are not afforded the same protection as NHAs. These sites are proposed by the NPWS but are not statutorily proposed or designated. Prior to statutory designation these are subject to a very limited legal protection. They are, however, sites of significance for wildlife and habitats and are important for the purposes of this Biodiversity Chapter.

Legally protected species

Many species of animal and plant receive some degree of legal protection. For the purposes of this study, legal protection refers to:

- Species included in the Wildlife (Amendment) Act 2000, excluding species that are only protected in relation to their sale, reflecting the fact that the Site disposal will not include any proposals relating to the sale of species; and,
- Species afforded protection under the Flora (Protection) Order 2022 (S.I.No.235/2022).

Other notable habitat / species categories

- Biodiversity Action Plan ('BAP') species: those targeted in local or national BAPs as being of particular conservation concern (priority species);
- Red and Amber List birds: those listed as being of high or medium conservation concern as listed by Birdwatch Ireland on the Birds of Conservation Concern in Ireland 2020-2026 [69]; and,
- Other Irish Red Data Book species [70] and Nationally / Regionally / Locally Notable species where appropriate.

6.2.9 National Planning Context

The National Planning Context is presented below under the headings of project Ireland and Regional Planning Context.

6.2.9.1 Project Ireland 2040

Project Ireland 2040 was launched by the Government in February 2018 [18] and incorporates two policy documents, i.e., the NPF and the NDP.

National Planning Framework

Under "Project Ireland 2040 National Planning Framework" [18], National Policy Objective 59 states:

> *'Enhance the conservation status and improve the management of protected areas and protected species by:*
>
> - *Implementing relevant EU Directives to protect Ireland's environment and wildlife;*
> - *Integrating policies and objectives for the protection and restoration of biodiversity in statutory development plans;*
> - *Developing and utilising licensing and consent systems to facilitate sustainable activities within Natura 2000 sites; and,*
> - *Continued research, survey programmes and monitoring of habitats and species.*'

National Policy Objective 60 in the same document states to:

> *'Conserve and enhance the rich qualities of natural and cultural heritage of Ireland in a manner appropriate to their significance.'*

Updated Draft Revised National Planning Framework (November 2024) [71]

Following a decision of Government in June 2023, the preparation of a revised NPF commenced to take account of changes that have occurred since it was published in 2018 and to build on the framework that is in place. Public consultation took place from 10th July 2024 to 12th September 2024 following which the Government agreed to progress and publish a draft schedule of amendments to the First Revision to the NPF, in November 2024. Finalisation will be subject to environmental assessments.

Objectives under the 'Strategic Planning for Biodiversity' section of this draft framework include the following:

National Policy Objective 84

> *'In line with the National Biodiversity Action Plan and European Union Nature Restoration Law, and best available scientific information, regional and local planning authorities shall support the preparation and implementation of the National Restoration Plan.'*

National Policy Objective 85

> *'In line with the National Biodiversity Action Plan; the conservation, enhancement, mitigation and restoration of biodiversity is to be supported by:*
>
> - *Integrating policies and objectives for the protection and restoration of biodiversity, including the principles of the mitigation hierarchy of - avoid, minimise, restore and offset - of potential biodiversity impacts, in statutory land-use plan.*
> - *Retention of existing habitats which are currently important for maintaining biodiversity (at local/regional/national/international levels), in the first instance, is preferable to replacement/restoration of habitats, in the interests of ensuring continuity of habitat provision and reduction of associated risks and costs.'*

National Policy Objective 86

> *'In line with the objectives of the National Biodiversity Action Plan, planning authorities should seek to address no net loss of biodiversity within their plan making functions.'*

National Policy Objective 87

'Enhance the conservation status and improve the management of protected areas and protected species by:

- *Implementing relevant EU Directives to protect Ireland's environment and wildlife and support the objectives of the National Biodiversity Action Plan;*
- *Developing and utilising licensing and consent systems to facilitate sustainable activities within Natura 2000 sites;*
- *Continued research, survey programmes and monitoring of habitats and species.'*

The National Development Plan (2021-2030)

The NPF [18] and The NDP [19] will continue to align and form a single vision for Ireland under Project Ireland 2040.

The NDP also lists the following items as strategic investment priorities in relation to National Heritage and biodiversity:

- *'Implementation of the current and future National Biodiversity Action Plan, delivery of National Parks and Wildlife Service Farm Plans and LIFE projects, enhanced wildlife crime investigation capacity and identification and delivery conservation measures at designated sites as identified in the Prioritised Action Framework for Ireland (2021-2027).'*
- *'Investment in nature and biodiversity, to improve the quality of natural habitats and support native plants and animals, including those under threat, and to bolster broader societal wellness and sustainability goals.'*
- *'Future-proofing obligations under the Biodiversity Strategy 2030, including potential national designations and the preparation and delivery of a National Restoration Plan.'*

6.2.10 Regional Planning Context

The RSES [21] recognises the need to conserve and enhance biodiversity through coordinated spatial planning in the eastern and midland regions.

One of the guiding principles of this document relating to the Proposed Development is to:

> *'Explore opportunities for biodiversity enhancement to improve ecological connectivity as part of the strategic re-intensification of urban infill and brownfield sites.'*

Under the biodiversity section, the following regional policy objectives relative to the Proposed Development are listed:

RPO 7.16

> *'Support the implementation of the Habitats Directives in achieving an improvement in the conservation status of protected species and habitats in the Region and to ensure alignment between the core objectives of the EU Birds and Habitats Directives and local authority development plans.'*

RPO 7.17

> *'Facilitate cross boundary co-ordination between local authorities and the relevant agencies in the Region to provide clear governance arrangements and coordination mechanisms to support the development of ecological networks and enhanced connectivity between protected sites whilst also addressing the need for management of alien invasive species and the conservation of native species.'*

RPO 10.6

'Delivery and phasing of services shall be subject to the required appraisal, planning and environmental assessment processes and shall avoid adverse impacts on the integrity of the Natura 2000 network.'

6.2.11 Local Planning Context

The following section presents the CDP and its relevant policies.

6.2.11.1 Wicklow County Development Plan 2022-2028

The CDP [5] contains several policies and objectives which relate directly to the protection of biodiversity and natural heritage in the context of the Proposed Development. These include policies to ensure compliance with the EU Habitats Directive and to ensure the protection of the integrity of European sites.

In Chapter 17 – Natural Heritage & Biodiversity, the CDP states that it is the policy of the Council to:

CPO 17.1

'To protect, sustainably manage and enhance the natural heritage, biodiversity, geological heritage, landscape and environment of County Wicklow in recognition of its importance for nature conservation and biodiversity and as a non-renewable resource.'

In relation to protected species, it is the policy of the Council to:

CPO 17.4

'To contribute, as appropriate, towards the protection of designated ecological sites including Special Areas of Conservation (SACs) and Special Protection Areas (SPAs); Wildlife Sites (including proposed Natural Heritage Areas); Salmonid Waters; Flora Protection Order sites; Wildfowl Sanctuaries (see S.I. 192 of 1979); Freshwater Pearl Mussel catchments; and Tree Preservation Orders (TPOs).'

CPO 17.5

'Projects giving rise to adverse effects on the integrity of European sites (cumulatively, directly or indirectly) arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects shall not be permitted on the basis of this plan.'

CPO 17.6

'Ensure that development proposals, contribute as appropriate towards the protection and where possible enhancement of the ecological coherence of the European Site network and encourage the retention and management of landscape features that are of major importance for wild fauna and flora as per Article 10 of the EU Habitats directive. All projects and plans arising from this Plan will be screened for the need to undertake Appropriate Assessment under Article 6 of the Habitats Directive.'

CPO 17.7

'To maintain the conservation value of all proposed and future Natural Heritage Areas (NHAs) and to protect other designated ecological sites in Wicklow.'

CPO 17.8

'Ensure ecological impact assessment is carried out for any proposed development likely to have a significant impact on proposed Natural Heritage

Areas (pNHAs), Natural Heritage Areas (NHAs), Statutory Nature Reserves, Refuges for Fauna, Annex I habitats, or rare and threatened species including those species protected by law and their habitats. Ensure appropriate avoidance and mitigation measures are incorporated into development proposals as part of any ecological impact assessment. '

In relation to Site & Corridors of Ecological & Biodiversity Value, it is the policy of the Council to:

CPO 17.12

'To protect non-designated sites from inappropriate development, ensuring that ecological impact assessment is carried out for any proposed development likely to have a significant impact on locally important natural habitats, species or wildlife corridors. Ensure appropriate avoidance and mitigation measures are incorporated into development proposals as part of any ecological impact assessment. '

CPO 17.14

'Ensure that development proposals support the protection and enhancement of biodiversity and ecological connectivity within the plan area in accordance with Article 10 of the Habitats Directive, including linear landscape features like watercourses (rivers, streams, canals, ponds, drainage channels, etc), woodlands, trees, hedgerows, road and railway margins, semi-natural grasslands, natural springs, wetlands, stonewalls, geological and geo-morphological systems, features which act as stepping stones, such as marshes and woodlands, other landscape features and associated wildlife where these form part of the ecological network and / or may be considered as ecological corridors or stepping stones that taken as a whole help to improve the coherence of the European network in Wicklow.'

In relation to Woodlands, Trees and Hedgerows, it is the policy of the Council to:

CPO 17.23

'To require the retention, wherever possible, of hedgerows and other distinctive boundary treatment in the County. Where removal of a hedgerow, stone wall or other distinctive boundary treatment is unavoidable, provision of the same type of boundary will be required of similar length and set back within the site in advance of the commencement of construction works on the site (unless otherwise agreed by the Planning Authority).'

In relation to Landscape, Views & Prospects, it is the policy of the Council to:

CPO 17.37

'To resist development that would significantly or unnecessarily alter the natural landscape and topography, including land infilling / reclamation projects or projects involving significant landscape remodelling, unless it can be demonstrated that the development would enhance the landscape and / or not give rise to adverse impacts.'

6.2.11.2 County Wicklow Heritage Plan 2017-2022

The County Wicklow Heritage Plan ('CWHP') was published in 2017 by WCC [72]. This plan details actions and objectives to conserve the natural, built and cultural heritage of Wicklow and to foster greater awareness, appreciation and enjoyment of this by all. The objective within the CWHP, which relates to biodiversity, is:

Objective 3.6

> *'Support the implementation of the All-Ireland Pollinator Plan in county Wicklow through engagement with the National Biodiversity Data Centre (NBDC) and with target audiences.'*

6.2.11.3 Draft County Wicklow Heritage Plan 2025-2029

As a result of consultation with the public and key stakeholders from May to July 2024, a draft plan for the County Wicklow Heritage Plan 2025-2029 ('dCWHP') was agreed by WCC in November 2024 [73]. The dCWHP will be Wicklow's fourth Heritage Plan. The dCWHP was prepared by the Wicklow Heritage Forum in accordance with the Heritage Council's guidelines for Local Authority Heritage Plans (2024).

The aim of this plan is to:

> '*Support better protection and promotion of our heritage by fostering awareness, building capacity in the heritage sector and building climate resilience in our heritage assets.'*

The following action within the dCWHP relates to biodiversity:

Action 13.

> '*Work with the Biodiversity Officer to support the development and implementation of the County Wicklow Biodiversity Plan 2025-2030 to protect key habitats and species.'*

6.2.11.4 County Wicklow Biodiversity Action Plan 2010-2015

The County Wicklow Biodiversity Action Plan ('CWBAP') was published in 2010 by WCC as an action of the County Wicklow Heritage Plan . At the time of writing this report, the Wicklow County Biodiversity Action Plan 2025-2030 is in the early stages of development. It was intended that the actions in the CWBAP would continue to be implemented beyond its five-year plan timescale as part of the ongoing implementation of the County Wicklow Heritage Plan.

The CWBAP provides a framework to manage biodiversity in the county and outlines a series of actions which are listed under each of the four objectives of the plan, including:

Objective 1

> *'To better understand the biodiversity of Wicklow.'*

Objective 2

> *'To raise awareness of biodiversity in Wicklow, its value and the issues facing it.'*

Objective 3

> *'To conserve and enhance habitats and species in Wicklow, taking account of national and local priorities.'*

Objective 4

> *'To foster active participation to help biodiversity in Wicklow, encouraging a partnership approach to help our species and habitats.'*

6.2.11.5 Coillte South-East Five-Year Forest Plan 2021-2025

A Coillte Woodland is located directly northeast of the Site boundary. Under the Coillte South-East Five-Year Forest Plan 2021-2025 , this forest is not listed as having "special habitats", "protected or rare species" or specific "issues to be addressed".

6.3 Receiving Environment

This section identifies European sites with the potential to be impacted by the Proposed Development. This section follows the European Commission Methodology and Guidance and presents its relevant planning guidelines.

6.3.1 Desk Study Results

6.3.1.1 European Designated Sites

In accordance with the European Commission Methodological Guidance , a list of European sites that can be potentially affected by the Proposed Development has been compiled. Guidance for Planning Authorities prepared by the Department of Environment Heritage and Local Government states that defining the likely zone of impact for the screening and the approach used will depend on the nature, size, location, and the likely effects of the project. The key variables determining whether or not a particular European site is likely to be negatively affected by a project are:

- The physical distance from the project to the European site;
- The presence of impact pathways;
- The sensitivities of the ecological receptors; and,
- The potential for in-combination effects.

All SPAs and SACs within 15km have been considered to assess their ecological pathways and functional links. As acknowledged in the Office of Public Relations (‘OPR’) guidelines , few projects have a Zone of Influence this large. However, the identification of European sites within 15km has become widely accepted as the starting point for the screening process. For this reason, all SPAs and SACs in 15km have been identified for consideration as part of the screening.

Five European sites were located within 15km of the Site - these are identified in Figure 6-1 and Table 6-1.

Figure 6-1: European Sites within 15km of the Site

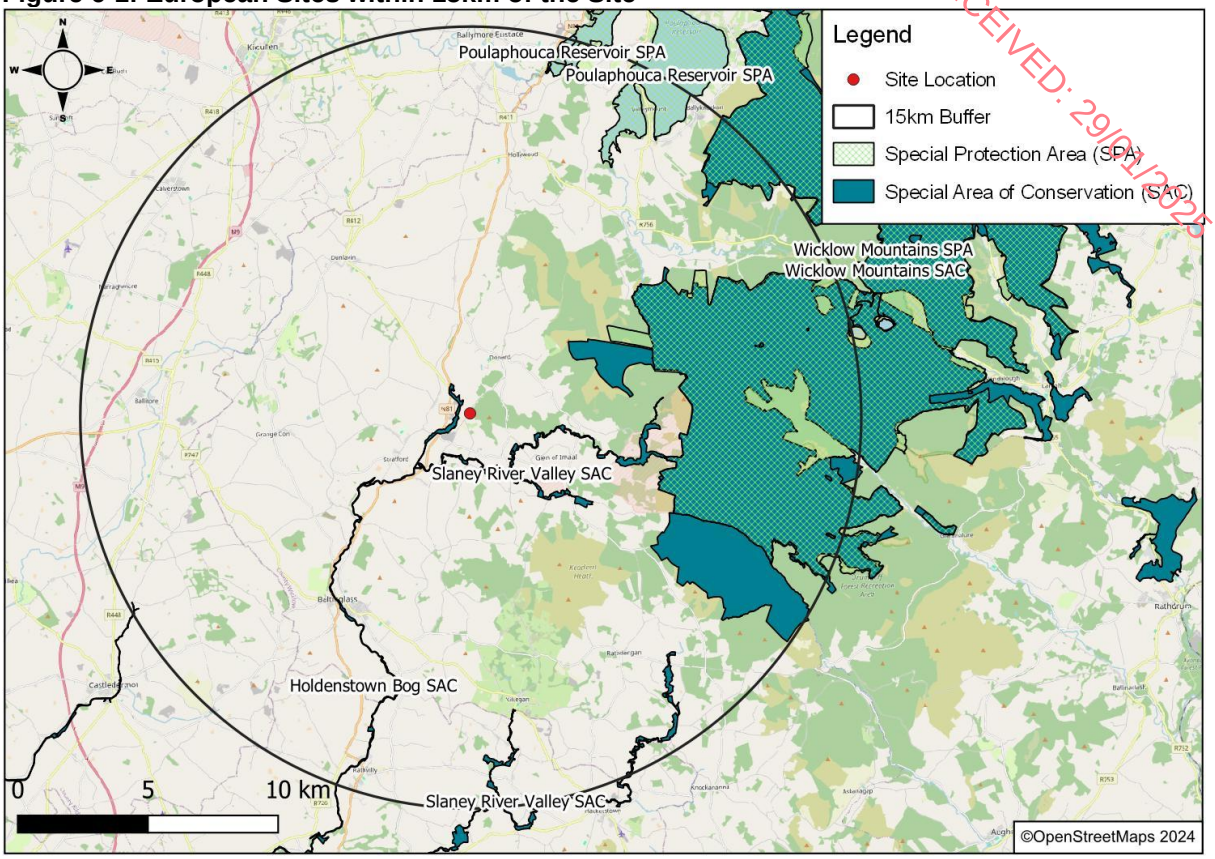


Table 6-1: European Designated Sites within 15km of the Site

Site Name	Site Code	Distance (km) & Direction
Special Area of Conservation ('SAC')		
Slaney River Valley	000781	328m W
Wicklow Mountains	002122	4.4km NE
Holdenstown Bog	001757	10.5km SW
Special Protection Area ('SPA')		
Wicklow Mountains	004040	6km NE
Poulaphouca Reservoir	004063	10.8km NE

The Site is not located within or adjacent to any European sites; however, the boundaries of three SACs and two SPAs are located within 15km of the Site.

Given the distance and intervening lands between the Wicklow Mountains SAC, Wicklow Mountains SPA, Holdenstown Bog SAC and Poulaphouca Reservoir SPA, these European sites have been screened out from further consideration.

As outlined in Section 3.2, there is no surface water drainage connection to the Slaney River Valley SAC. All surface water runoff will percolate to the ground or during heavier rain, it will be directed to water management ponds and in turn discharged to land drains and a pond off-site.

However, given the proximity of the Site to the Carrigower River and the groundwater flow direction underneath the Site, there is a potential connection to the Slaney River Valley SAC.

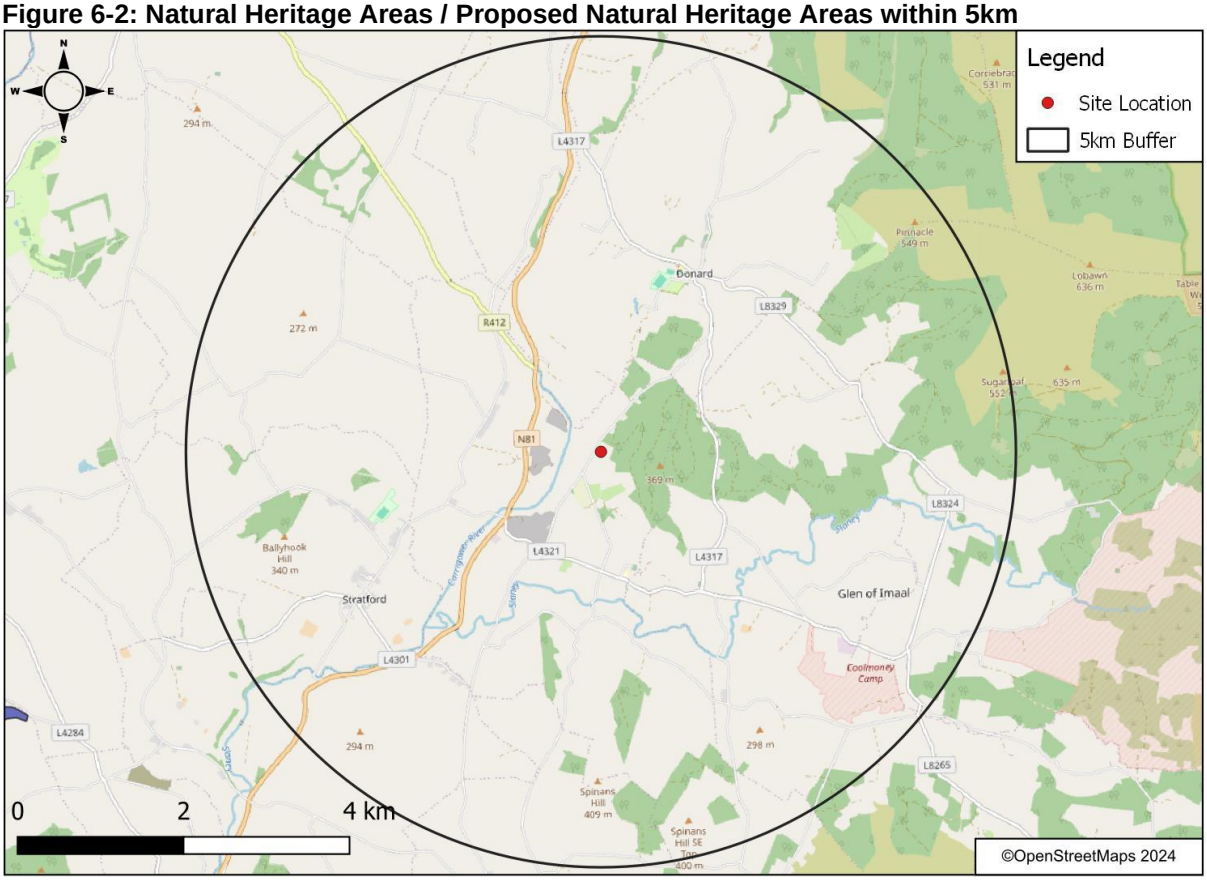
Therefore, further consideration was given to the Slaney River Valley SAC in the NIS submitted alongside this report as part of the overall planning application. This groundwater connection is also addressed further in Chapter 8 - Water.

6.3.1.2 Natural Heritage Areas

The Natural Heritage Areas ('NHAs') and proposed Natural Heritage Areas ('pNHAs') within a 5km radius of the Site have been considered.

No NHAs or pNHAs were identified within 5km of the Site; refer to Figure 6-2 below.

Figure 6-2: Natural Heritage Areas / Proposed Natural Heritage Areas within 5km



6.3.1.3 Protected Species

NBDC Records

Table 6-2 provides a summary of the legally protected or otherwise notable species that have been recorded within 2km of the Site at the time of writing this report [64]. The NBDC records were checked on 21st January 2025. The following 2km grids were checked: S99B, S99C, S99D, S99G, S99H, S99I [64].

Only species recorded within the past 10 years were included in Table 6-2. The parameter of 10 years was chosen on the basis of habitat adaption and modification; it is considered that any records over 10 years old are not representative of the current distribution of species populations.

Table 6-2: NBDC Species within 2km of the Site (Gride Codes: S99B, S99C, S99D, S99G, S99H, S99I)

Common Name	Scientific Name	Date of last record	Designation
Amphibians			

Common Name	Scientific Name	Date of last record	Designation
Common Frog	*Rana temporaria*	10/03/2020	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex V
Smooth Newt	*Lissotriton vulgaris*	31/03/2019	Wildlife Acts 1976 / 2000
Bat Species			
Leisler's bat	*Nyctalus leisleri*	22/08/2019	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex IV
Common Pipistrelle	*Pipistrellus pipistrellus*	01/08/2019	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex IV
Daubenton's Bat	*Myotis daubentonii*	28/05/2015	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex IV
Nathusius' Pipistrelle	*Pipistrellus nathusii*	22/08/2017	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex IV
Soprano Pipistrelle	*Pipistrellus pygmaeus*	22/08/2019	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex IV
Bird Species			
Barn Owl	*Tyto alba*	01/07/2015	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Red List
Buzzard	*Buteo buteo*	24/11/2019	Wildlife Acts 1976 / 2000
Eurasian Jay	*Garrulus glandarius*	24/11/2019	Wildlife Acts 1976 / 2000
Eurasian Sparrowhawk	*Accipiter nisus*	24/11/2019	Wildlife Acts 1976 / 2000
Eurasian Woodcock	*Scolopax rusticola*	13/03/2023	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Red List
Kingfisher	*Alcedo atthis*	25/03/2023	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Raven	*Corvus corax*	24/11/2019	Wildlife Acts 1976 / 2000
White-throated Dipper	*Cinclus cinclus*	14/01/2020	Wildlife Acts 1976 / 2000
Terrestrial Mammals			

Common Name	Scientific Name	Date of last record	Designation
European Otter	*Lutra lutra*	09/10/2015	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II and IV
Eurasian Badger	*Meles meles*	31/12/2016	Wildlife Acts 1976 / 2000
Irish Hare	*Lepus timidus subsp. hibernicus*	04/04/2021	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex V
Pine Marten	*Martes martes*	27/12/2021	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex V
West European Hedgehog	*Erinaceus europaeus*	10/08/2022	Wildlife Acts 1976 / 2000
Invasive Species*			
American Mink	*Mustela vison*	12/08/2018	High Impact Invasive Species Regulation S.I. No. 374/2024 (Ireland)

*Only invasive species that are regulated under S.I. No. 374/2024 were included in this Table [68].

Previous Survey Records within the Site

The raptor survey completed in 2022 identified clusters of peregrine falcon (*Falco peregrinus*) pellets, feeding remains and whitewash within the historic quarry area .

The following bird species were recorded within the historic quarry area and lands under owner interest: blue tit (*Cyanistes caeruleus*), blackbird (*Turdus merula*), rook (*Corvus frugilegus*), jackdaw (*Corvus monedula*), chaffinch (*Fringilla coelebs*), barn swallow (*Hirundo rustica*), greenfinch (*Chloris chloris*), robin (*Erithacus rubecula*), magpie (*Pica pica*), hooded crow (*Corvus cornix*), great tit (*Parus major*), wood pigeon (*Columba palumbus*), starling (*Sturnus vulgaris*), pied wagtail (*Motacilla alba*), buzzard (*Buteo buteo*), and wren (*Troglodytes troglodytes*) .

Bat surveys were previously conducted within the historic quarry area and lands under owner interest in support of a planning application. These passive bat surveys took place on 31st August 2020 and 16th September 2021. Leisler's bat (*Nyctalus leisleri*), common pipistrelle (*Pipistrellus pipistrellus*) and soprano pipistrelles (*Pipistrellus pygmaeus*) were recorded foraging within the survey area .

6.3.2 Field Surveys

The following section provides details of the field-based assessment that was undertaken for the Site on 8th June 2023 and the updated field survey on 29th October 2024. The distribution of the habitats and target notes identifying the location of features of interest are shown in Figure 6-3.

6.3.2.1 Habitats

Habitats within the Site Boundary

Improved Agricultural Grassland ('GA1')

This was the dominant habitat on-site. The Site boundary encompassed one entire agricultural grassland field and intersected four others. These four fields extended outside the Site

boundary into the lands under owner interest to the north, east and west. At the time of the survey, these fields were utilised as pastures for sheep.

The species recorded within the improved agricultural grassland fields included: autumn hawkbit (*Scorzoneroides autumnalis),* rough hawkbit (*Leontodon hispidus*), creeping buttercup (*Ranunculus repens*), meadow buttercup (*Ranunculus acris),* pignut (*Conopodium majus*), bluebell (*Hyacinthoides non-scripta*), marsh thistle (*Cirsium palustre*), dandelion (*Taraxacum officinale),* field forget-me-not (*Myosotis arvensis*), cow parsley (*Anthriscus sylvestris*), common velvet grass *(Holcus lanatus*), common starwort (*Stellaria graminea*), clovers (*Trifolium* spp.) and silverweed (*Argentina anserina*). Pockets of gorse (*Ulex europaeus*) were also present within these fields.

The field margins were largely composed of stinging nettles (*Urtica dioica*) and bracken (*Pteridium aquilinum*). These fields were bound by treelines, stone walls, scrub habitats, or mixed broadleaved woodland (as detailed below).

Treelines ('WL2')

Treelines formed almost the entire boundary of the land under owner interest. They formed the southern and half of the western boundary of the Site. Treelines were also found along the northwestern and northeastern boundaries of the Site. Two treelines also traversed through the Site, reaching the stone walls, and demarcating the fields, as shown on Figure 6-3.

A treeline was identified along a stone wall at the midwest boundary of the Site. This treeline comprised of beech (*Fagus sylvatica*), pedunculate oak (*Quercus robus*) and downy birch (*Betula pubescens*). A small patch of gorse was recorded in front of the treeline.

The western treeline comprised a large, mature trees, including seven large beech trees (*Fagus sylvatica*), with low bat potential. Other tree species present included ash (*Fraxinus excelsior*) and sycamore (*Acer pseudoplatanus*). The understorey of this treeline was mainly bare, with sparse sections of gorse, hawthorn (*Crataegus monogyna*) and bramble (*Rubus fruticosus*), and small pockets of nettles and bracken. There was a fence located along this treeline. A treeline was located parallel to this treeline across the GA1 field. This treeline contained tree species, including ash and hawthorn, with low bat potential. The understorey consisted mainly of nettles.

The horizontal treeline at the south boundary of the Site is comprised mainly of immature hawthorn and a few mature beech trees. South of this treeline, another treeline extends perpendicular to it. The Site boundary extends south to encompass the east edge of this treeline, where an overground pipe will be located. This treeline won't be affected as no infrastructural works will occur along it.

A treeline was located atop a stone wall toward the north of the Site, separating two agricultural grassland fields, one of which contained the old quarry and areas of mixed broadleaved woodland on-site. This treeline was sparse with low-growing hawthorn trees and gorse. There was thick ivy (*Hedera helix*) in the treeline toward the western boundary.

Stone Walls and Other Stonework ('BL1')

Multiple stone walls were recorded on-site. These features occurred alongside treelines or as standalone field boundaries. These stone walls supported patches of moss and lichen, but no notable plant species were recorded.

Spoil and Bare Ground ('ED2')

An area of spoil and bare ground was located at the entrance to the old quarry along the northeastern boundary of the Site. The majority of this area was devoid of vegetation, however, its margins comprised of stinging nettles, cleavers (*Galium aparine*), herb Robert (*Geranium robertianum*), bracken and brambles. The remnants of a concrete wall was identified in this area.

Bare ground access tracks lead from the old quarry into the improved agricultural grassland fields on-site.

Recolonising Bare Ground ('ED3') / Disturbed Ground ('ED')

This habitat was identified within the old quarry area. The old quarry was characterised by steep edges and vegetated margins with only one upper ledge free from vegetation. The species present here included crested dog's tail (*Cynosurus cristatus*), common dandelion, lesser trefoil (*Trofolium dubium*), silver hair grass (*Deschampsia cespitosa*), silverweed, thistles (*Cirsium* spp.), clovers, creeping buttercup, rough hawkbit, bird's-foot trefoil (*Lotus corniculatus*), delicate fern moss (*Thuidium delicatulum*), butterfly bush (*Buddleja davidii*) and common rushes (*Juncus effusus*). This habitat was slowly transitioning towards a mixture of grassland and scrub habitats.

Scrub ('WS1')

Scrub bordered the old quarry area and extended down to the quarry floor. Older areas of scrub to the south were transitioning into mixed broadleaved woodland patches. The species recorded within this habitat included immature Sitka spruce *(Picea sitchensis*), goat willow (*Salix caprea*), downy birch, gorse, butterfly bush (*Buddleja bavidii*), scotch broom (*Cytisus scoparius*), and holly (*Ilex aquifolium*).

Mixed Broadleaved Woodland ('WD1')

Patches of mixed broadleaved woodland have developed in between the old quarry, areas of scrub and the Donard Mountain road. The trees identified in the woodland area adjacent to the road included hawthorn, beech, sycamore and ash trees. The understorey of this woodland area comprised of cow parsley, dandelions, bracken and hart's tongue fern (*Asplenium scolopendrium*).

Sitka spruce and downy birch were also identified in patches of woodland surrounding the quarry. The understorey of this habitat was a continuation of the scrub described above.

Dense Bracken ('HD1'):

In between the scrub habitats surrounding the old quarry and the improved agricultural grassland to the south, a patch of dense bracken was identified. The cover of bracken along this field margin was almost continuous and no shrub species or brambles were identified in this area.

Habitats within the Lands Under Ownership Interest

The following habitats were identified outside the Site boundary within the lands under ownership interest:

- Improved Agricultural Grassland (GA1);
- Wet Grassland (GS4);
- Scrub (WS1);
- Dense Bracken (HD1);
- Treelines (WL2); and,
- Stone Walls and Other Stonework (BL1).

These were a continuation of the habitats found on-site and are presented in Figure 6-3.

Figure 6-3: Habitat Map

Habitats of note outside of the Site Boundary and Lands Under Owner Interest

The following section provides details of the field-based assessment that was undertaken for the assessment in relation to the off-site pond and the proposed locations for passing bays and widening along the haul route on 29th October 2024. The distribution of the habitats are shown in Figure 6-4.

Hedgerows/Treelines (WL1 / WL2)

Hedgerows/treelines bordered both sides of the road to the east of the Site. All hedgerows/treelines were present alongside sloped verges with varying vegetation densities. Dominant species noted along the hedgerows/treelines included beech, lime (*Tilia cordata*), sycamore, ash, common bracken, brambles and ivy. Three trees, ash, lime and sycamore, with features suitable for roosting bats were noted in the hedgerow/treeline. Please see Figure 6-4 below for further context.

Mixed Broadleaved Woodland (WD1)

A small woodland pocket was present east of the Donard Mountain Road, ca. 158m east of the Site. This area did not have suitable habitat for badgers. However, it had potential for commuting and foraging bats. This woodland pocket contained mature tree species including ash and sycamore.

A small woodland pocket was located ca. 786m south of the Site at the end of the Donard Mountain Road before an intersection. While no evidence of badger was identified during the survey, this area was considered suitable for sett construction. This habitat was also considered suitable for foraging and commuting badger. The dominant tree species in this woodland pocket was beech, with mature and immature trees found throughout. Common bracken and ivy covered a large area of the ground and ivy covered most of the trees. Downy birch, hawthorn and several conifer trees were also found in this area.

Artificial Lakes and Ponds (FL8)

The pond located ca. 490m southwest of the Site will be used to manage excess groundwater and prevent overflow of proposed attenuation ponds on-site (refer to Section 8.3.5 in Chapter 8 – Water for further details). At the time of this survey, the pond contained small shallow pools of water. A small trickle of water was flowing into the pond via the existing drainage. Previous Site visits undertaken by MOR Environmental noted that the pond had large pools of water present. The pond is heavily encroached by scrub. Plant species found in the pond consisted of nettles, bitter dock (*Rumex obtusifolius*), brambles and tree saplings. No aquatic plant species were present.

Figure 6-4: Habitats of note outside of the Site Boundary and Lands Under Owner Interest

6.3.2.2 Species

Flora

No plant species protected under the Flora Protection Order were recorded on-site.

Amphibians

The NBDC held records of two amphibian species, common frog and smooth newt, within 2km of the Site over the last ten years [64]. The habitats on-site have the potential to support amphibians during the terrestrial phase of their life cycle. During the reptile survey on 1st August 2023, a common frog was identified within the lands under owner interest to the north of the Site, refer to TN1 in Figure 6-3 for context. However, no suitable waterbodies or drainage ditches were identified on-site or within the lands under ownership interest that could support breeding amphibians. It is considered that the off-site pond which will be used to manage excess groundwater will provide suitable habitat for amphibians.

Badger

The NBDC held records of badger within 2km of the Site over the last ten years [64]. No direct evidence of badger in the form of snuffle holes, scat, prints or feeding remains was identified on-site nor any potential setts.

As mentioned in Section 6.2.4 above, a 150m buffer of the adjacent Coillte Woodland was surveyed for badger activity in order to fully assess the potential effects of the Proposed Development in relation to blasting activities. No badger setts or evidence of badger activity was identified within this 150m buffer zone. Additionally, potential suitable habitats for badger in the mixed broadleaved woodland along the proposed layby and road haul route will not be impacted by the proposed works.

However, multiple mammal paths were identified on-site and the improved agricultural grassland, treelines and scrub habitat have the potential to support foraging and commuting badger.

Bats

The Site is located within a rural landscape with extensive areas of open farmland, woodland pockets and hedgerows/treelines. According to the NBDC, the Site is situated within a moderate bat suitability landscape with an index score ranging from 21-28 [64]. There were records of five out of the nine resident Irish bat species within 2km of the Site over the last ten years, common pipistrelle, soprano pipistrelle, Daubenton's bat, Nathusius' pipistrelle and Leisler's bat [64].

The key findings from the bat surveys undertaken at the Site were:

- No bats were identified roosting in any trees on-site;
- Common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Leisler's bat, brown long-eared bat, and *Myotis* species were recorded foraging and commuting within the Site. The most frequently encountered species was soprano pipistrelle, followed by common pipistrelle; and,
- Soprano pipistrelles and common pipistrelles were recorded within 15 minutes of sunset during the dusk survey, indicating that bat roosts are likely present within the vicinity of the Site.

Additionally, as part of the survey on 29th October 2024 which assessed the habitats along the proposed passing bays and widening along the haul route, it was concluded that three trees along the haul route had features suitable for roosting bats. However, these trees will not be removed as part of the proposed road works. Additionally, the extent of trees / vegetation to be removed for the proposed road works are will not be significant for bats.

Please see Appendix 6-2 – Bat Survey Report for further details.

Birds

The Site was assessed for its potential to provide nesting habitat for breeding birds. The combined findings from the comprehensive bird surveys undertaken at the Site by both MOR Environmental and Dr. Marc Ruddock, Mr. Douglas Ruddock, Mr. James Irons and Mr Alan Ferguson across 2023 and 2024 were:

- A total of 44 species were recorded during the breeding bird surveys;
- According to the Birds of Conservation Concern in Ireland ('BoCCI'), 30 species were green-listed, ten species were amber-listed and four red-listed species were identified;
- Long-eared owls (*Asio otus*) were confirmed to be breeding within the woodland inside the disused quarry.
- Buzzards (*Buteo buteo*) and sparrowhawks (*Accipiter nisus*) were identified breeding in lands bordering the Site to the east and west; and,
- The majority of birds recorded were considered '*possibly breeding*' on-site.

Please refer to Appendix 6-3 – Bird Survey Report and Appendix 6-4 – Raptor Report for further details.

Otter

The NBDC held records of otter within 2km of the Site . However, the habitat survey did not identify any evidence of otters on-site i.e. spraints, prints or feeding remains, nor did the survey identify any drainage ditches or watercourses on-site. The on-site habitats are considered to be unsuitable for holt construction, as well as commuting and foraging otter. Additionally, the off-site pond that will be used to manage excess water from the Site provides no suitable habitat for holt construction, commuting or foraging otter. Given the nature of the on-site habitats which provides sub-optimal habitat for otter, it is considered unlikely that the Site is of any value to otter.

The Carrigower River, which forms part of the Slaney River Valley SAC, is located ca. 330m west of the Site boundary and is considered suitable for otter. The Donard Mountain Road and the intervening lands between the Site and the Carrigower River would act as a significant dispersal barrier. However, an impact pathway between the Site and the Carrigower River via groundwater has been identified.

Reptiles

The reptile surveys carried out on-site did not identify any evidence of reptiles on the Site.

Please see Appendix 6-5 – Reptile Survey Report for further details.

Invasive Species

A fallow deer (*Dama dama*) was directly observed during the habitat survey (TN2, Figure 6-3). Fallow deer are a high-impact invasive species that are subject to restrictions under Regulations 16(1) and 16(2) of the European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024) [68]. This deer was recorded moving between scrub habitat on-site and the Coillte woodland outside the Site boundary. Deer droppings were identified in the lands under owner interest during the reptile survey conducted on 31st July 2023, refer to TN3 in Figure 6-3 for reference.

Fox scat was identified within the lands under owner interest during the reptile survey on 23rd August 2023, refer to TN4 in Figure 6-3.

Butterfly bush (*Buddleja davidii*) was identified within the Site in the old quarry area. This is a medium-impact invasive species that is not currently regulated under S.I. No. 374/2024 [68].

The NBDC held records of American mink, a high-impact invasive species regulated under S.I. No. 374/2024, within 2km of the Site [64]. This species can thrive in most habitat types in Ireland in areas where there are slow-moving freshwater bodies present. However, no watercourses or drainage ditches were identified on-site, and no evidence of this species was found in the form of dens, spraints or prints.

Other Species

Multiple rabbit droppings were identified within the grassland fields on-site, and a small mammal hole suitable for European rabbits was identified within the treeline along the southern boundary of the Site.

The NBDC also held records of pine marten within 2km of the Site [64]. Pine marten display a preference for woodland habitats to forage and shelter but have also been recorded in scrub and rocky areas. No evidence of this species was identified on-site. Pine marten tend to avoid open areas which are devoid of suitable cover. Therefore, the grasslands and open areas on-site are not considered suitable for this species. However, there is potential for this species to utilise the treelines, scrub and woodland areas on-site for foraging and commuting purposes.

Hedgehogs are a common and widespread species that typically occur in scrub, woodland and rank grassland habitats. The NBDC held records of hedgehogs within 2km of the Site [64]. No direct evidence of hedgehogs was identified on-site; however, the treelines, scrub and woodland habitats within the Site boundary provide suitable cover and sheltering habitat for this species.

No other notable or protected species were identified on-site or are considered likely to occur.

6.4 Characteristics and Potential Effects of the Proposed Development

6.4.1 Sensitive Design

- Extractive activities can create important habitats which are suitable for a number of rare and protected species, such as Red Hemp-nettle (*Galeopsis angustifolia*), Basil thyme (*Acinos arvensis*), rare orchids, sand martins and peregrine falcons. A Restoration Plan will be implemented following completion of the quarrying activities in order to conserve and, where possible, enhance the areas of retained and created habitat;
- All boundary treelines that are to be retained will be protected from unnecessary damage. A minimum buffer of 5m will be maintained between the retained treelines on-site and the new vegetated berms and areas of ground disturbance. This buffer will be extended as required to include the full crown extent of the retained trees bordering the Site;
- All vegetation removal required on-site will be undertaken in accordance with relevant legislation to avoid potential disturbance to nesting birds. These works will be undertaken outside the period of 1st March to 31st August;
- Topsoil to be stripped from the Site, will be reused, where possible, in berms around the perimeter of the proposed extraction area. This will ensure that impacts on the soil are minimised / avoided;
- The Site's standard operation hours will be from 08:00 to 18:00 on Monday to Friday and 08:00 to 14:00 on Saturdays. Therefore, potential impacts to nocturnal species in the area will be limited; and,
- Dust control measures will be implemented as part of ongoing works, as detailed in Chapter 9 (Air Quality).

6.4.2 Identification of Potentially Significant Effects on Identified Receptors

Based on the methodology that is set out in Section 6.2, Table 6-3 sets out the findings of the valuation of important and legally protected receptors. Each receptor is assessed and a scoping justification for each receptor is provided for the Construction, Operational and Rehabilitation Phases combined.

Table 6-3: Valuation of Potential Ecological Receptors

Potential Biodiversity Receptor	Relevant Legislation / Policies	Valuation of the Site	Scoping Result and Justification	Scoping Result
Protected sites				
European Sites	European Communities (Natural Habitats) Regulations 1997 (as amended)	International importance	A Stage Two Appropriate Assessment Report: Natura Impact Statement ('NIS') was prepared as part of the overall planning application. These designated sites were assessed in line with policies CPO 17.4, CPO 17.5, and CPO 17.6 of the CDP [5] and policy objectives RPO7.16 and RPO10.6 of the Eastern & Midland RSES [21]. The NIS concluded that with the implementation of the proposed mitigation measures, the Proposed Development will not, either alone or in combination with other plans or projects, adversely affect the integrity or conservation status of any of the qualifying interests of the Slaney River Valley SAC or any other European site and that progression to Stage Three of the Appropriate Assessment process (i.e. Assessment of Alternative Solutions) was not considered necessary. This receptor has, therefore, been scoped out for further consideration.	European sites have been scoped out from further consideration.
Natural Heritage Areas ('NHA') and Proposed Natural Heritage Areas ('pNHAs')	WilSlife Act 2000 (as amended).	National importance	Nationally designated sites were considered as part of this assessment in line with policies CPO17.4, CPO17.7 and CPO17.8 of the CDP [5]. There are no NHAs or pNHAs within 5km of the Site. This receptor has, therefore, been scoped out for further consideration.	Proposed Natural Heritage Areas have been scoped out from further consideration.
Habitats within the Site boundary				
Improved Agricultural Grassland (GA1)	N/A	Local importance (lower value)	This habitat covered the majority of the Site and is widespread across Ireland. The species found in this habitat were typical grassland species and were not of conservation concern. Furthermore, the presence of sheep within this habitat suggests that this habitat is subject to frequent grazing, lowering its biodiversity value. Any loss of this habitat is not considered to be significant. Therefore, the impact of the Proposed Development on this habitat is not significant and this receptor has been scoped out from further consideration.	Improved agricultural grassland has been scoped out from further consideration.

Potential Biodiversity Receptor	Relevant Legislation / Policies	Valuation of the Site	Scoping Result and Justification	Scoping Result
Stone Walls and Other Stonework (BL1)	N/A	Local importance (lower value)	Stone walls are found throughout Ireland and can support a variety of wildlife. However, no notable plant species were identified growing within or atop these stone walls. As such, any loss or disturbance to this habitat will not negatively impact the biodiversity of the Site. Therefore, stone walls and other stonework has been scoped out from further consideration.	Stone walls and other stonework has been scoped out from further consideration.
Spoil and Bare Ground (ED2)	N/A	Local importance (lower value)	Spoil and bare ground habitats are of limited ecological value. Therefore, any alteration or loss of this habitat is not considered to be significant. Subsequently, the impact of the Proposed Development on spoil and bare ground is not significant and this receptor has been scoped out from further consideration.	Spoil and bare ground has been scoped out from further consideration.
Recolonising Bare Ground (ED3)	N/A	Local importance (lower value)	Recolonising bare ground is of low ecological value. Therefore, any alteration or loss of this habitat is not considered to be significant. Subsequently, the impact of the Proposed Development on recolonising bare ground is not significant and this receptor has been scoped out from further consideration.	Recolonising bare ground has been scoped out from further consideration.
Dense Bracken (HD1)	N/A	Local importance (lower value)	The dense bracken habitat on-site was considered to be of low ecological value. Therefore, any alteration or loss of this habitat is not considered to be significant. Subsequently, the impact of the Proposed Development on dense bracken is not significant and this receptor has been scoped out from further consideration.	Dense bracken has been scoped out from further consideration
Scrub (WS1)	Wildlife Act 2000 (as amended)	Local importance (lower value)	The Proposed Development will result in the removal of ca. 0.14ha of scrub to facilitate the office / welfare unit, weighbridge, wheel wash and extraction area. However, it is important to note that the vegetation clearance will be limited to those required for the proposed works. Restrictions apply with regard to the time of year in which vegetation can be cut (see nesting birds below). Therefore, any vegetation clearance works will need to take account of protected species and mitigation measures will apply. For this reason, scrub has been scoped in for further consideration.	Scrub has been scoped in for further consideration.
Treelines (WL2)	Wildlife Act 2000 (as amended)	Local importance (higher value)	The treelines on-site were considered to be of higher local value. 453m of treelines will be removed to facilitate the Proposed Development. This includes the treeline running from north to south separating the two southern fields, the treeline running from east to west separating the old quarry	Treelines have been scoped in for further consideration.

Potential Biodiversity Receptor	Relevant Legislation / Policies	Valuation of the Site	Scoping Result and Justification	Scoping Result
			area from the improved agricultural grassland fields and the treeline to the west of the old quarry area and parallel to the Donard Mountain road. This will result in a total loss of ca. 453m of treelines. However, the treelines bordering the Site to the north, south, east and west will be protected and retained throughout the lifetime of the Proposed Development in line with policy CPO 17.14 of the CDP [5]. As restrictions apply with regards to the time of year in which treelines can be cut in order to avoid impacts to protected species such as nesting birds (see below) and given the measures that will need to be implemented to protect the retained treelines on-site, this receptor has been scoped in for further consideration.	
Mixed Broadleaved Woodland (WD1)	Wildlife Act 2000 (as amended)	Local importance (higher value)	The mixed broadleaved woodland on-site was considered to be of higher local value for biodiversity. As part of the Proposed Development, ca. 0.56 ha of woodland will be removed. Restrictions apply with regards to the time of year in which vegetation can be cut (see nesting birds below). Therefore, any vegetation clearance works will need to take account of protected species and mitigation measures will apply.	Mixed broadleaved woodland has been scoped in for further consideration.
Habitats of note outside of the Site boundary and Lands Under Owner Interest				
Hedgerows / Treelines (WL1 / WL2)	Wildlife Act 2000 (as amended)	Local importance (higher value)	The hedgerows / treelines that bordered both sides of the road to the east of the Site were considered to be of higher local value for biodiversity. Three trees with features suitable for roosting bats were noted in the hedgerow / treeline within the habitats outside of the Site boundary and lands under owner interest. The proposed laybys and road haul route has been designed taking into account biodiversity. Sections of the hedgerow/treelines will be removed to facilitate the formalisation of existing laybys and add visibility to the laybys. Additionally, vegetation will be removed to widen the road in some places. However, the extent of vegetation to be removed is small and will not result in a loss of connectivity and is not considered to be significant for birds or bats within the local area. Additionally, birds and bats will be able to use the areas of planting included in restoration plan. It should be noted that the road works will be undertaken by the local authority, and these works are unlikely to have significant impacts on biodiversity within the local area. All works will be subject to the necessary statutory consents. The trees with roosting bat potential do not need to be removed to facilitate these road works. Therefore, the hedgerows / treelines outside of the Site boundary and Lands Under Owner Interest have been scoped out from further consideration.	Hedgerows / Treelines have been scoped out from further consideration

Potential Biodiversity Receptor	Relevant Legislation / Policies	Valuation of the Site	Scoping Result and Justification	Scoping Result
Mixed Broadleaved Woodland (WD1)	Wildlife Act 2000 (as amended)	Local importance (higher value)	The two small woodland pockets were considered to be of high local value for biodiversity. It was concluded that the woodland pocket to the east of the Site had potential for commuting and foraging bats. The woodland pocket to the south of the Site had potential habitat for badger sett construction, and suitability for foraging and commuting badger. However, no evidence of badger was observed within this area during the Site walkover. It should be noted that the road works will be undertaken by the local authority, and these works unlikely to have significant impacts on biodiversity within the local area. All works will be subject to the necessary statutory consents. The trees within this area do not need to be removed to facilitate these road works. Therefore, the mixed broadleaved woodland outside of the Site boundary and Lands Under Owner Interest have been scoped out from further consideration.	Mixed Broadleaved Woodland has been scoped out from further consideration
Artificial Lakes and Ponds (FL8)	N/A	Local importance (higher value)	The pond located ca. 490m south of the Site will be used for will be used to manage excess groundwater and prevent overflow of proposed attenuation ponds on-site. The pond is located ca. 165m from the Carrigower River and no drainage ditches connect the pond to this river. The pond is considered suitable for amphibians which are a prey species for otter. Otter are known to travel over land to ponds such as this during the amphibian breeding season to feed on these species. Given the proximity of the Carrigower and the intervening lands which comprise of agricultural lands, it is considered possible that otter may forage within this waterbody at certain time of the year. During the Site visit undertaken by MOR Environmental Ecologists in October 2024 the water levels within this pond were very low and the pond has become heavily encroached by scrub and it was concluded that this pond was of limited value for wetland birds. However certain wetland bird species such as coot (*Fulica atra*) and moorhen (*Gallinula chloropus*) may potentially use the Site. Any pumping from the water management ponds into the land drainage system leading to the overflow pond will be restricted to agricultural rates. This will prevent extreme fluctuations in water levels in the pond, so the pond will continue to provide suitable habitat for amphibians and any wetland birds that currently use the pond. Additionally, no construction work will take place within this area. Therefore, artificial pond outside of the Site boundary and Lands Under Owner Interest has been scoped out from further consideration.	Artificial Lakes and Ponds have been scoped out from further consideration

Potential Biodiversity Receptor	Relevant Legislation / Policies	Valuation of the Site	Scoping Result and Justification	Scoping Result
Flora and Fauna				
Flora	Flora (Protection) Order 2022 (S.I. No. 235/2022)	N/A	No plant species protected under the Flora Protection Order were noted on-site. Overall, the impact of the Proposed Development on notable / protected flora is considered to be imperceptible. Therefore, this receptor has been scoped out from further consideration.	Flora have been scoped out from further consideration.
Amphibians	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex V	Local importance (lower value)	Amphibians are commonly associated with quarry sites and are relatively widespread and abundant in Ireland. No amphibians were identified on-site; however, one common frog was identified within the lands under owner interest and the improved agricultural grassland, bracken and scrub habitat on-site are considered suitable for amphibians during the terrestrial phase of their life cycle. No suitable breeding habitats for frogs or newts was identified on-site. However, as amphibians were found adjacent to the Site, this receptor has been scoped in for further consideration. However, it should be noted that as part of the Proposed Development, two attenuation ponds will be constructed. These attenuation ponds will remain on-site after operations have ceased and will provide suitable potential breeding habitats for amphibians on-site.	Amphibians have been scoped in for further consideration.
Badgers	Wildlife Acts 1976 / 2000	Local importance (lower value)	No evidence of badger nor any badger setts were recorded during the field surveys. However, badgers are a common and widespread species across Ireland, and the habitats on-site provide opportunities for foraging and commuting badgers. In addition, woodland habitats are located to the north and east of the Site. Although no badger setts were identified within 150m of the Site boundary, there is potential for badger to utilise the adjacent Coillte woodland for sett construction. It is, therefore, reasonable to conclude that badgers may occasionally utilise the Site for foraging and commuting purposes. Adopting a precautionary approach, general mitigation measures to prevent impacts on badgers will be undertaken. These measures are in line with CPO17.8 and CPO17.12 [5]. Therefore, this species has been scoped in for further assessment.	Badgers have been scoped in for further consideration
Bats	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex IV	Local importance (higher value)	There are no buildings or structures with bat roost potential within the Site boundary. In addition, the trees on-site that were identified as having potential roost features were surveyed and no bats were recorded roosting within these trees. The treelines, woodland and scrub habitats within the Site boundary that were considered suitable for foraging and commuting bats were also surveyed. The treeline in the south of the Site was the most used treeline for foraging and commuting bats. Bats were also recorded commuting over the	Bats have been scoped in for further consideration.

Potential Biodiversity Receptor	Relevant Legislation / Policies	Valuation of the Site	Scoping Result and Justification	Scoping Result
			scrub/woodland habitats on-site. As outlined above, ca. 453m of treelines, ca. 0.14ha of scrub and ca. 0.56ha of woodland habitat and the majority of the improved agricultural grassland on-site will be removed to facilitate the Proposed Development. However, as part of the proposed restoration phase, replacement woodland planting will be implemented, and the quarry floor will be restored to species-rich grassland. Additionally, screening berms planted with native trees will be constructed around the boundaries of the quarry and two removed treelines will be replanted. Once trees in the woodland, berms and replanted treelines become mature they will provide potential foraging and commuting habitats for bats. Additionally, the species-rich grassland and attenuation ponds will encourage insects on-site, providing suitable prey species for foraging bats. As mitigation measures will be required to compensate for the loss of foraging and commuting habitats for bats and to ensure no adverse effects from the installation of lighting onsite, this species has been screened in for further consideration. In addition, as bats are nocturnal mammals, they have the s	

Potential Biodiversity Receptor	Relevant Legislation / Policies	Valuation of the Site	Scoping Result and Justification	Scoping Result
Birds	Nesting Birds Wildlife Acts 1976 / 2000 Peregrine Falcon Wildlife Acts 1976 / 2000 EU Habitats Directive Annex I Bird Species	Local importance (higher value)	Nesting Birds The treelines, woodland and scrub habitats on-site offer good foraging and nesting potential for a range of common bird species. Approximately 453m of treelines, ca. 0.7ha of woodland/scrub habitat and most of the improved agricultural grassland on-site will be removed to facilitate the Proposed Development. This will result in the loss of potential nesting and foraging habitat for breeding bird species. Therefore, mitigation measures have been incorporated below in relation to breeding birds. It is important to note that additional planting will be implemented to compensate for the vegetation removed during the construction phase of the Proposed Development; refer to Section 6.5.2 below for further information. Peregrine Falcon It should be noted that the peregrine falcon surveys conducted within the Site in 2023 and 2024 did not confirm any active peregrine falcon nests or any peregrines utilising the Site. Peregrines were identified within 2km of the Site by the external surveyors, refer to Appendix 6-4 for full survey results. The Site is currently unsuitable for breeding peregrine falcon due to scrub encroachment and vegetation growth. However, it is considered that the quarry faces created as part of the Proposed Development will provide suitable potential breeding and resting grounds for peregrine falcon, which currently do not exist on-site. As peregrine falcons are a legally protected Annex I species commonly associated with quarries, further consideration will be given to this species in order to ensure this species is not disturbed by the Proposed Development.	Birds have been scoped in for further consideration
Otter	Wildlife Acts 1976 / 2000	Local importance (lower value)	The habitat survey did not identify any signs of otter within the Site or lands under owner interest. The habitats on-site are not considered suitable for otter. Also, the off-site pond that will be used to manage excess water from the Site had no suitable habitat for otter holt construction but could provide a suitable foraging habitat. No construction works will take place at this pond and this waterbody will not be affected by the Proposed Development. Water pumped into this pond will be restricted to agricultural rates, which will prevent extreme fluctuations in water levels within the pond. This will prevent impacts to amphibian populations within the pond and, therefore, prevent impacts to the potential food sources of otter. However, the Site has a potential hydrological connection to the Carrigower River via groundwater flow from the Site. This pathway could result in hydrocarbons potentially entering the surface water network without appropriate mitigation in place which in turn could lead to water	Otter have been scoped in for further consideration.

Potential Biodiversity Receptor	Relevant Legislation / Policies	Valuation of the Site	Scoping Result and Justification	Scoping Result
			quality impairment. Water quality impairment has the potential to impact otter both directly and indirectly by diminishing their food supply. Therefore, this species has been scoped in for further consideration.	
Reptiles	Wildlife Acts 1976 / 2000	Local importance (lower value)	The reptile surveys conducted on-site did not identify any evidence of reptiles; refer to Appendix 6-5 for further information. Therefore, no specific mitigation is required for this species. However, should reptiles or any other notable / protected species be encountered during the proposed works, an Ecological Clerk of Works ('ECoW') will be consulted for advice before works within the area continue. This species has been scoped out from further consideration.	Reptiles have been scoped out from further consideration.
Invasive Species	N/A	N/A	One high-impact invasive species, fallow deer (*Dama dama*), is listed under Regulations 16(1) and 16(2) of the European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024) [68], was recorded on-site during the field survey. This deer was recorded moving between the scrub habitat on-site and the Coillte woodland outside the Site boundary. The Proposed Development will not result in or facilitate the spread of fallow deer on-site. No specific mitigation measures are required for fallow deer. Only one medium-impact invasive species, butterfly bush, which is currently unregulated, was identified on-site. Standard measures will be implemented to ensure no invasive species are introduced into the Site during the construction, operational and restoration phases of the Proposed Development (see Section 6.5 below). This is in compliance with objective CPO 17.17 of the CDP [5].	Invasive species have been scoped in for further consideration.
Other Species	Common species N/A	Local importance (lower value)	Given the presence of suitable habitats on-site and within the wider area for deer, rabbits, and other terrestrial mammals standard protection measures for these species will be incorporated into the works in line with CPO17.12 of the CPD [5] refer to Section 6.5.5 below.	Other species have been scoped in for further consideration.

6.4.3 Summary

Following a detailed assessment, the following species and habitats were identified as significant receptors and were brought forward for further consideration in Section 6.5 below:

- Scrub (WS1);
- Treelines (WL2);
- Mixed Broadleaved Woodland (WD1);
- Amphibians;
- Badgers;
- Bats;
- Birds;
- Otters;
- Invasive Species; and,
- Other Species.

In addition to the species listed above, general mitigation / best practice measures have also been included for the Proposed Development. As noted above, a Restoration Plan will be developed for the Site to be implemented following completion of the quarrying activities. An outline plan is presented as part of Appendix 6-1, for further details refer to Section 6.5.7 below.

6.5 Proposed Mitigation Measures

The following mitigation measures will be incorporated and adhered to during the Construction and Operational Phases at the Site to ensure that the works do not result in contravention of wildlife legislation:

- Quarrying activities will comply with all relevant legislation and best practice to reduce any potential environmental impacts. The mitigation measures detailed within this EIAR will be fully adhered to; and,
- The quarry operator shall ensure that all personnel working on-site are trained and aware of the mitigation measures detailed within the EIAR.

The following general measures will also be adhered to during the proposed works:

- If protected or notable species are encountered during the proposed works, works should stop within the area that these species are identified in and the Ecological Clerk of Works ('ECoW') will be contacted for advice;
- Should unidentified burrows be identified within the works area, the ECoW will be contacted, and advice sought;
- Noise mitigation measures have been included in Chapter 11: Noise and Vibration to reduce potential disturbance effects on the local environment. This will in turn, protect species within the wider area; and,
- Groundwater protection measures have been included in Chapter 8: Water (Hydrogeology and Hydrology) to prevent potential contamination of ground and surface water. These measures will also ensure the protection of aquatic environment and species.

An ECoW will inspect the Site in advance of works commencing and will undertake Site inspections as required during the works to ensure that all works are completed in line with the measures in this EIAR and wildlife legislation.

6.5.1 Protection of Treelines

To ensure that no impacts or unnecessary damage occurs to the retained treelines that border the Site as per policy CPO 17.14 of the CDP [5], the following protection measures will be adhered to during the works:

- Care will be taken when planning ground clearance to ensure that no machinery or plant comes into contact with retained trees. Such contact can result in serious damage to them and might make their safe retention impossible;
- Where machinery access has to encroach areas within close proximity to retain trees, a Root Protection Area ('RPA') will be established, and suitable ground protection will be put in place to prevent any significant soil compaction or root damage. This should take the form of suitable strength ground protection mats or cellular confinement system capable of supporting the appropriate weight;
- When tree removal is required in close proximity to retained trees, felling must be carried out in small sections to avoid damage to adjacent trees;
- Planted berms will be created in between the proposed extraction area and retained treelines to the south and west. Exclusionary fencing will also be installed between the retained treelines and planted berms. This will act as an additional protective barrier in between the retained trees and areas of disturbance;
- A minimum buffer of 5m will be maintained between the retained treelines on-site and areas of disturbance i.e. the proposed extraction area and the proposed berms. This buffer will be extended as required to include the full crown extent of the retained trees bordering the Site;
- No materials, equipment or machinery will be stored within close proximity to retained treelines;
- Notice boards, wires, etc. will not be attached to any trees;
- The construction of the berms on-site will be supervised by an ECoW to ensure that no impacts occur to bordering treelines. The retained trees will be assessed following the completion of these works; and,
- In order for treeline protection measures to work effectively, all personnel associated with the operation of heavy plant machinery must be familiar with the above principles for the protection of treelines.

It should be noted that the works within the proposed extraction area (i.e. ground clearance and quarrying works) will be completed on a phased basis to minimise areas of exposed ground.

6.5.2 Proposed Planting

The treelines and woodland habitats on-site are considered to be of high local biodiversity value whilst the scrub habitat is considered to be of low local value. As part of the Proposed Development, ca. 453 linear metres of treelines will be removed and ca. 0.7ha of woodland / scrub habitats will also be removed.

As outlined in Section 3.3.1 of this EIAR, two screening berms will be constructed along the south and west boundaries of the Site. The combined length of these berms is ca. 513m. These berms will be 3m high and 11m wide. The berms will provide a larger area for vegetation to become established, given their 11m width.

These berms will be planted with native tree species and will compensate for the treelines that will be removed to facilitate the Proposed Development.

In addition, it is proposed to plant ca. 1.03ha of woodland to the north of the Site in order to replace the woodland and scrub habitats removed to facilitate the Proposed Development. In addition, ca. 0.393ha of planting will occur along the eastern boundary of the Site in between the proposed quarry face and the existing treelines. Refer to Appendix 6-1 for further information.

The planting will take place within the first available season (November to March), and any trees that fail to become established within 5 years of planting will be replaced by trees of a similar size / species within the next available planting season.

As part of the restoration phase of the Proposed Development, two treelines will be re-planted in the western portion of the Site. Refer to Appendix 6-1 for full details.

6.5.3 Measures for Amphibians

While there are no suitable breeding habitats for amphibians on-site, the habitats are considered to be suitable for amphibians during the terrestrial phase of their life-cycle. Additionally, one amphibian species, common frog, was found during a reptile survey in lands under owner interest to the north of the Site. Additionally, the off-site pond which will provide suitable habitat for amphibians will not be affected by the Proposed Development. Therefore, the following construction procedures and mitigation measures will be implemented:

- Vegetation clearance and ground stripping works will be supervised by the ECoW to ensure no adverse effects occur to any amphibians in the area;
- If amphibians are encountered during these works, the ECoW will relocate them to suitable areas outside of the Site boundary; and,
- Should amphibians be encountered during operations, the ECoW will be consulted for advice.

6.5.4 Measures for Terrestrial Mammals

Given the presence of habitats within the Site boundary that have the potential to support sheltering, foraging and commuting mammals (inclusive of badgers), general construction procedures and mitigation measures which are in line with the NRA (now TII) guidance for badgers will be implemented :

- The clearance of the woodland and scrub habitats on-site will be supervised by the ECoW;
- If unidentified burrows are identified within the works area during Site clearance or operations, the ECoW will be contacted for advice. The ECoW will consult with the NPWS as required; and,
- Exclusionary fencing will be installed in between the constructed berm and existing treelines bordering the Site This will exclude terrestrial mammals from the proposed extraction area and associated ledges.

In addition, general measures for the protection of nocturnal species are outlined below, which will, in turn, protect terrestrial mammals.

6.5.5 Protection for Bats

The following mitigation measures will be followed during the works to ensure that no impacts occur to bats:

- A minimum buffer of 5m will be maintained between the proposed extraction area and the retained treelines on-site. This will ensure that bats can continue to utilise the retained linear features for foraging and commuting purposes;
- The Restoration Plan (attached as Appendix 6-1) includes for the creation of woodland habitats and the planting of two vegetated berms with native trees during the initial phase of the Proposed Development. This will maintain potential foraging habitat for bats. The attenuation ponds will also be retained and bound by a wet meadow mix to provide additional areas for foraging bats.

Please refer to Appendix 6-2 - Bat Report for full details of the mitigation measures for bats. In addition, general measures for the protection of nocturnal species are outlined below which will, in turn, protect bats.

6.5.6 Protection for Nocturnal Species

Nocturnal mammals are affected by lighting. Therefore, it is important that any lighting introduced onsite is cognisant of the sensitivity of local wildlife while still providing the necessary lighting for human usage. Any lighting introduced onsite will be in line with the following measures:

- Avoidance of excessive lighting;
- Lighting will be aimed only where it is needed, with no upward lighting;
- Lighting will be installed with a sensor timer so that lights only switch on when activated by a person;
- Lighting will be directed away from retained scrub / woodland habitats, planted areas and hedgerows / treelines, where possible;
- Accessories such as baffles, hoods or louvres will be used to reduce light spill and direct light only where it is needed; and,
- The height of any lighting introduced onsite will be reduced as much as possible, as lighting at a low level further reduces ecological impact.

6.5.7 Protection for Birds

Nesting Birds

In order to ensure no impacts occur to nesting birds within and bordering the Site, the following mitigation measures will be put in place:

- As per Section 40 of the Wildlife Act 1976, as amended by Section 46 of the Wildlife (Amendment) Act 2000, the cutting, grubbing, burning or destruction by other means of vegetation growing on uncultivated land or in hedges or ditches will be restricted during the nesting and breeding season for birds and wildlife, from 1st March to 31st August. All vegetation clearance on-site will be conducted in line with this legislation;
- In the unlikely event that works need to be undertaken within the main breeding season, this would be undertaken in consultation with NPWS and the ECoW;
- Prior to any vegetation removal, the ECoW will inspect the Site;
- All vegetation clearance works will be undertaken in a systematic way. The ECoW will inspect the Site during the vegetation clearance works;
- All Site personnel will be made aware of the locations of significant bird species and habitats prior to the commencement of works;
- Where possible, significant ornithological habitats will be retained on-site;

- Five long-eared owl nest baskets will be installed throughout the Site, including in the retained scrub / woodland habitat and on the proposed berms planted with native trees. The exact location will be confirmed by the ECoW. These baskets will provide potential nesting habitat for these species. The installation of these nest baskets will be undertaken by an expert tree climber or off-road mobile elevated work platform ('MEWP');
- In the unlikely event that birds nest within the active working area during the construction works, all works will stop within the immediate area and the ECoW will be consulted for advice; and,
- If peregrine falcon or other notable / protected bird species are identified colonising any areas to be impacted by the operations on-site, then works will stop within the identified area. An appropriate undisturbed buffer zone will need to be established for the duration of the breeding season or until the chicks have fledged and left the nest. This will be confirmed by the ECoW.

As outlined above, the treelines bordering the Site will be protected from unnecessary damage and subsequently, some habitats with nesting potential will be maintained. In addition, woodland planting and screening berms will be introduced on-site as part of the construction phase of the Proposed Development. The woodland area and berms will be planted with native trees as outlined in Section 6.6.2 above and in Appendix 6-1. These berms will help compensate for the loss of potential nesting habitat by providing potential habitats for birds in the future. Similarly, the proposed re-planting of treelines as part of the restoration phase of the Proposed Development will provide additional habitats for breeding birds; refer to Appendix 6-1 for further information.

Following the implementation of the above-mentioned mitigation measures and taking into account the species identified on-site (refer to Appendix 6-3 Bird Report for further information), it is considered unlikely that birds will be significantly affected as a result of the Proposed Development. In addition, as birds are highly mobile, it can be concluded that any temporarily disturbed birds will move away from any disturbances to a more suitable area.

Peregrine Falcon

It is anticipated that the nest ledges may become improved and provide better nesting and roosting habitats for peregrine falcons due to the clearance of scrub and vegetation currently growing and enclosing the rock face. However, to ensure that peregrine falcons that do use the Site in the future will be protected for the lifetime of the Proposed Development and after the closure of the Site, the following measures will be implemented:

- Construction works should begin outside of the main breeding season (1st March to 31st August) to allow peregrine falcon time to habituate to the Proposed Development;
- All personnel operating on-site will be made aware of the legal protection afforded to peregrine falcons and biodiversity signage will be erected throughout the quarry;
- The existing northern and northeastern rock faces will be retained and optimised where possible (i.e. both areas will be extracted as early as possible during construction to create a long-term dormant rock face). This will ensure older suitable faces are maintained for peregrine falcon throughout the construction, operation and restoration phases. A nest box will be installed along the northeast quarry face after quarrying in this area has ceased;
- As works progress through the Site, additional alternative nest ledges and/or artificial boxes will be created at two-three locations near the top of the developing cliffs on the northeastern and eastern rock faces;

- If peregrine falcon are identified colonising any areas to be impacted by the Proposed Development, then works will stop within the identified area. An appropriate undisturbed buffer zone will need to be established for the duration of the breeding season or until the chicks have fledged and left the nest, which will be confirmed by the ECoW;
- Should a peregrine falcon nest be identified on-site, all personnel operating on the Site will be made aware of the presence and location of the nest. Access will be restricted below cliffs which are actively being utilised by peregrine falcons. This will be done using fencing and/or other appropriate barriers;
- Infrastructure will not be installed, nor any material stockpiled, within 25-50m of rock faces supporting peregrine falcon. Vegetation should also be managed within this 25-50m area to keep vegetation away from nest locations. All vegetation management or required barrier installation will take place outside of the breeding bird season;
- No blasting should occur along the western rock face during the main breeding season (unless the breeding status of peregrine falcon is confirmed to have failed by an experienced raptor ecologist);
- A buffer of 25-50m will be implemented from any identified peregrine falcon nests on-site if works are required during the breeding season (in consultation with a raptor expert). This distance may be increased if this buffer is deemed insufficient and peregrine falcon become disturbed due to works on-site;
- As part of the restoration plan for the Site, the quarry ledges will be left in place and unplanted. This will provide suitable breeding habitat for peregrine falcon;
- The breeding status of peregrine falcon will be established immediately prior to construction or extraction if works are required within 25-50m of the breeding nest cliffs during the main breeding period; and,
- An annual peregrine falcon monitoring programme will be established during the construction and extraction phases of the Proposed Development to establish the potential effects, if any, of the Proposed Development on peregrine falcon. It should also be established if peregrine falcon occupy the Site during the winter. This monitoring programme will be undertaken with a suitably qualified raptor expert, quarry operators and the NPWS.

The mitigation measures that will be implemented on-site will ensure that the Proposed Development does not result in undue disturbances to peregrine falcons.

6.5.8 Protection for Otters and Aquatic Species

The Site is not considered to be optimal for otters based on the on-site habitats and management of the Site. However, the Site has a potential hydrological connection to the Carrigower River, which forms part of the Slaney River Valley SAC, via groundwater flow from the Site.

Hydrocarbons have been identified as a potential pollutant arising from the Proposed Development. Hydrocarbons have the potential to change the chemical balance of a waterbody which can prove toxic to fish and other wildlife such as otters

In addition, WCC raised concerns on the potential for surface water runoff from the construction of the berms on the steep-sided slop onsite to reach a land drain which discharges to the Slaney River Valley. Therefore, sediment and silt in surface water runoff have been identified as potential pollutants. Sediment and silt have the potential to directly clog fish gills and smother aquatic vegetation and indirectly affect otters by reducing their food supply.

In order to ensure the proposed works do not have an effect on the Carrigower River, both ground and surface water mitigation measures will be implemented as part of the works. These mitigation measures are described in Chapter 7 Land Use, Soils and Geology and in Chapter 8: Water (Hydrogeology and Hydrology).

In the unlikely event that an unidentified holt is found during the proposed works onsite, as per the general measures for terrestrial mammals relating to burrows, works will cease within the area and the ECoW will be contacted for advice.

6.5.9 Measures for Invasive Species

In order to mitigate against the unintentional introduction of invasive species to the Site during quarrying operations, the following measures will be followed in-line with policy CPO 17.17 of the CDP [5] and the NRA guidelines for the management of noxious weeds and non-native invasive plant species :

- All vehicles, machinery and any other equipment that may be used for the works will be washed and cleaned prior to being mobilised to the Site to prevent the import of plant material / seeds;
- Before machinery or equipment is unloaded at the Site, equipment will be visually inspected to ensure that all adherent material and debris has been removed; and,
- Any vehicles and machinery that are not clean will not be permitted entry to the Site.

6.5.10 Restoration Phase

Following cessation of the quarry activities at the Site, a Restoration Plan for the Site will be implemented. Details of the Restoration Plan are attached in Appendix 6-1. The Restoration Plan has been developed taking into account the species that will likely utilise the area following completion of the works and also measures to enhance the quarry for these species.

The Restoration Plan includes for planting of native trees within a woodland area, along the eastern boundary and atop the soil embankments during operations. The Restoration Plan also includes for the restoration of the quarry floor to low nutrient landscape once operations have ceased. This habitat will then be allowed to undergo natural regeneration processes. The quarry faces and benches will be left bare for invertebrate species that specialise in bare-ground habitats whilst the areas atop the quarry face will be allowed to naturally recolonise over time. The attenuation ponds will be retained and planted with a wet meadow mix.

The Site will be subject to an updated ecological assessment after operations have ceased to ensure that the recommendations within the Restoration Plan remain relevant and to ensure that the works required to implement the plan will not result in any impacts on biodiversity or breaches of relevant wildlife legislation.

6.5.11 Unplanned Events

Should any protected or notable species colonise the Site during the life cycle of the Proposed Development, there is a potential for these species to be impacted by the operations on-site. However, the taxa commonly associated with quarry environments have been considered as part of this assessment. Ongoing ecological monitoring throughout the life cycle of the quarrying operations will ensure that any protected or notable species will be identified and that appropriate mitigation / preventative actions can be taken.

6.6 Cumulative and In-combination Impact

As described above, the proposed works are unlikely to have a significant impact on valued ecological receptors on-site or in the surrounding area.

Furthermore, any potential cumulative impacts will be minimised as all works will be completed in line with relevant best practice and legislation and mitigation measures detailed within the EIAR. Potential impacts associated with deterioration in water quality, air and climate have been addressed within Chapters 8, 9 and 10.

It is therefore considered unlikely that any significant cumulative and in-combination impacts will arise as a result of the Proposed Development. Subsequently, the cumulative impacts on ecology arising from the Proposed Development in combination with other developments is considered to be imperceptible.

6.7 Interactions with other Environmental Attributes

The Environmental Attributes which flora and fauna interact include:

- Chapter 7 – Land, Soils and Geology: Potential effects on soils and geology through contamination can have adverse effects on local biodiversity and ecological conditions. Mitigation measures have been included in Chapter 7 to avoid the contamination of soils and introduction of contaminated soils to the Site. In addition, soil reworking and bedrock extraction could release suspended solids, suitable soil management measures have been included as part of Chapter 7 to prevent this;
- Chapter 8 - Water (Hydrogeology and Hydrology): The Carrigower River, which forms part of the Slaney River Valley SAC, is located ca. 330m to the west of the Site. The SAC and Carrigower River are connected to the Site via a groundwater pathway. Appropriate mitigation measures are presented in Chapter 8 to protect groundwater and subsequently the SAC;
- Chapter 9 – Air Quality: Dust can affect the ability of vegetation to photosynthesise. Dust mitigation measures have been included in Chapter 9 to mitigate against potential effects;
- Chapter 10 – Climate: Climate change has the potential to affect ecosystems. An assessment was carried out on the projected GHG emissions, refer to Chapter 10 for further details from this assessment; and,
- Chapter 11 – Noise and Vibration: Species within the locality have the potential to be affected by noise disturbance. However, noise mitigation measures are presented in Chapter 11 to mitigate potential effects on the local environment.

6.8 Indirect Effects

There have been no significant or likely indirect effects identified outside of those previously assessed throughout the Chapter.

6.9 Residual Effects

Based on the methodology set out in Section 6.2.6, the initial assessment of ecological receptors (Table 6-4) screened out the following habitats and species:

- European sites;
- Proposed Natural Heritage Areas (‘pNHAs’)
- Improved Agricultural Grassland (‘GA1’);
- Wet Grassland (‘GS4’);
- Stone Walls and Other Stonework (‘BL1’);
- Spoil and Bare Ground (‘ED2’);
- Recolonising Bare Ground (‘ED3’);

- Dense Bracken ('HD1');
- Flora; and,
- Reptiles.

These ecological receptors were screened out from further assessment as the potential impacts were considered to be imperceptible; refer to Table 6-4 for further details. The following protected sites, species and habitats, outlined in Table 6-4, were identified as receptors that warranted further consideration to avoid impacts:

- Scrub ('WS1');
- Treelines ('WL2');
- Mixed Broadleaved Woodland ('WD1');
- Amphibians;
- Badgers;
- Bats;
- Birds;
- Invasive Species; and,
- Other Species.

Mitigation has been proposed for each of these ecological receptors alongside enhancement measures for the Site as part of the Restoration Plan as outlined in Section 6.5. The results of these measures on these ecological receptors and the resulting residual impact are described below in Table 6-4.

Table 6-4: Residual Impacts on Screened-In Receptors

Receptor	Potential Impact	Assessment of Impacts Post Mitigation and Enhancement	Residual Impact
Scrub (WS1)	Vegetation removal	Following the implementation of the proposed tree protection measures, outlined in Section 6.5.1, all retained trees will be protected from disturbance/damage. The Proposed Development will require treelines, scrub and woodland habitats to be removed. This will have a negative medium-long-term effect. However, the successful implementation of the Restoration Plan which includes for the planting of screening berms, boundary vegetation and woodland areas will ensure that the vegetation clearance undertaken at the Site is not significant.	Not significant
Treelines (WL2)			
Mixed Broadleaved Woodland (WD1)			
Amphibians	Loss of terrestrial habitats	Following the implementation of the mitigation measures outlined in Section 6.5.3 and the creation of habitats as per the Restoration Plan attached as Appendix 6-1, it is considered that potential impacts on amphibians will not be significant.	Not significant
Badgers	Disturbance	Following the implementation of the mitigation measures outlined in Section 6.5.4, 6.5.6 and 6.5.8, it is considered that potential impacts on badgers, otter and other terrestrial mammals will not be significant.	Not significant
Otters			
Other species			

Receptor	Potential Impact	Assessment of Impacts Post Mitigation and Enhancement	Residual Impact
Bats	Loss of foraging/commuting habitat	Following the implementation of the mitigation measures outlined in Section 6.5.5, 6.5.6 and the creation of habitats as per the Restoration Plan attached as Appendix 6-1, it is considered that potential effects on bats will not be significant.	Not significant
Birds	Disturbance of breeding birds	Following the implementation of the mitigation measures outlined in Section 6.5.6 it is considered that potential impacts on breeding birds will not be significant.	Not significant
	Impacts to peregrine falcon	Following the implementation of the mitigation measures outline in Section 6.5.6, it is considered that potential impacts on peregrine falcon will not be significant.	
Invasive Species	Introduction and spread of invasive species.	Provided the mitigation outlined in Section 6..7 is followed, it is considered that no impacts will occur to valued ecological receptors as a result of the spread or introduction of invasive species.	Imperceptible

Taking into account the mitigation measures that will be implemented, it is considered that the impacts on ecology from the construction phase and operational phase of the Proposed Development will not be significant.

In the longer-term following the cessation of the quarry activities at the Site and the successful implementation of the Restoration Plan, it is considered that the Proposed Development will not have a significant negative impact on biodiversity.

6.10 Monitoring

The following monitoring works will be implemented to ensure that the works comply with the recommendations detailed within this chapter of the EIAR:

- An ECoW will inspect the Site in advance of ground stripping works commencing and will undertake monthly Site inspections as required during the construction works, to ensure that all of the works are completed in line with the EIAR; and,
- Bergerhoff dust monitoring will be included as part of the that air quality mitigation measures. This will ensure that air quality mitigation measures included as part of the project have been effective and that the Proposed Development has not resulted in any significant impacts.

6.11 Reinstatement

The Site will be subject to a Restoration Plan following the cessation of extraction on-site. Details of the Restoration Plan are included in Appendix 6-1.

6.12 Difficulties Encountered

No difficulties were encountered in undertaking this assessment.

7 LAND USE, SOILS AND GEOLOGY

7.1 Introduction

This chapter of the EIAR provides a description and assessment of the likely impacts of the Proposed Development on land, soils and geology within and in the vicinity of the Site.

7.2 Methodology

The following chapter of the EIAR outlines the methodology used to assess the potential impacts of the Proposed Development on the land, soils and geology within the Site and its surrounding area.

7.2.1 Legislative Context

The importance / sensitivity of the geological receptors within the Site was assessed on completion of the desk study as set out in Table 3-4 of the EPA's 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports'. The Guidelines are formally adopted and published by the EPA [7].

In addition to the EPA Guidelines, the assessment was carried out in accordance with the following guidance and tailored accordingly based on professional judgement:

- Institute of Geologists Ireland ('IGI') Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements ;
- Department of Environment, Heritage and Local Government: Quarries and Ancillary Activities - Guidance for Planning Authorities [12];
- EPA Environmental Management in the Extractive Industry (Non-Scheduled Minerals) ; and,
- Institute of Environmental Management & Assessment ('IEMA') Guide: A New Perspective on Land and Soil in Environmental Impact Assessment .

7.2.2 Desk-based Study

A desk-based study of the Site was conducted using all available geological information. The following sources were reviewed for this purpose:

- Geological Survey of Ireland ('GSI') Public Data Viewer [31];
- Environmental Protection Agency ('EPA') Online Mapping; and,
- O'Rourke Drilling Ltd Rotary Drilling Logs.

7.2.3 Site Investigations

An intrusive site investigation was undertaken to characterise the geological and hydrogeological environment between 12th and 14th July 2023. Five groundwater monitoring wells (BH1-BH5) were installed within the Proposed Development. The groundwater wells were installed at depths ranging from 9.0 m below ground level ('mbgl') (BH5) to 60mbgl (BH1). MOR Environmental Consultants were not present during the installation of those groundwater wells.

Further, an observation of the quarry faces was undertaken by a MOR Environmental Geologist to record and log any visible water seepages and to record the dip and orientation of the exposed bedrock. An extra two groundwater wells were installed at the Site (BH6 and BH7) to investigate the potential availability of groundwater in the vicinity of BH2. During the installation works, the senior MOR Environmental Geologist noted changes in the lithological profile and evidence of water present within the bedrock. The borehole logs are shown in Appendix 7-1.

A topographical survey was undertaken by SixWest on 24th August 2023 to inform the topography of the Site and provide Ordnance Datum height references for the five groundwater monitoring wells (BH1-BH5) installed in July 2023.

7.3 Receiving Environment

The following sections describe the receiving environment under the headings: Topography, Bedrock Geology, Quaternary Geology, Land Use and Economic Geology, Soils and Geomorphology.

7.3.1 Topography

The northern area of the Site is located within the existing quarry, which has been previously subjected to quarrying activities. The quarrying activities within this area have extracted material to a depth of 165mAOD. According to the topographical site survey conducted by SixWest in August 2023, similar elevations were observed towards the south with elevations of 164mAOD. Those areas of the access roads to the north and south of the Site are mainly flat. Agricultural lands to the southeast and northeast have elevations between 198mAOD and 202mAOD, with the highest elevations occurring to the eastern boundary (209mAOD).

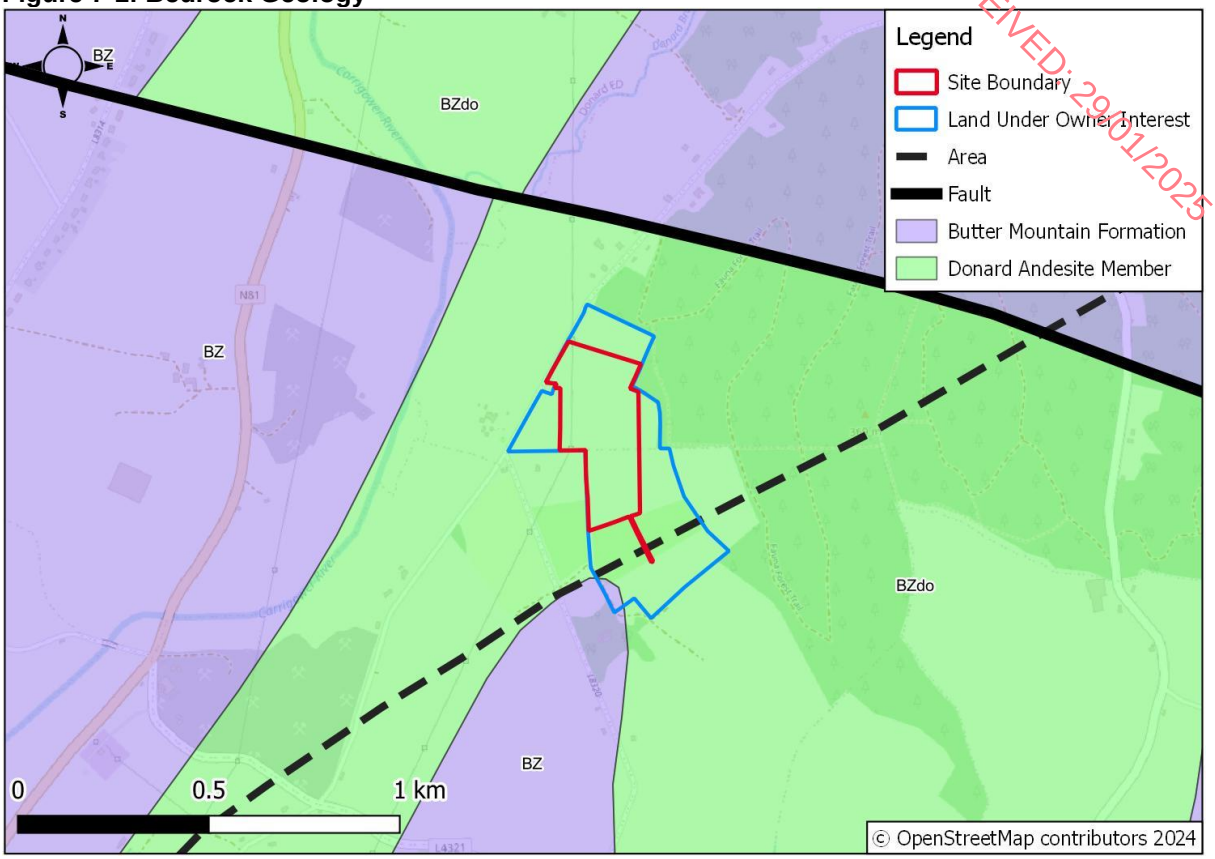
7.3.2 Bedrock Geology

The GSI bedrock map for the area shows that the Site is underlain by the Donard Andesite Member (Ordovician) of the Butter Mountain formation, which comprises andesite and andesitic tuff. From the lithological description, the andesites within the Donard Andesite Member are aphyric, or hornblende, pyroxene or plagioclase porphyritic [31].

Surrounding the Donard Andesite Member locally is the primary Butter Mountain Formation (Ordovician), which comprised dark slate-schist, quartzite and coticule, with the closest occurrence of this bedrock mapped as occurring 0.14km south of the Site. Located ca. 0.34km north of the Site is an east-west aligned fault ca. 22km of mapped length. The Site is centrally located along the fault, with changes in bedrock lithology indicating the displacement of Silurian and Ordovician geology along the fault [31].

A local bedrock geology map is shown in Figure 7-1 below.

Figure 7-1: Bedrock Geology

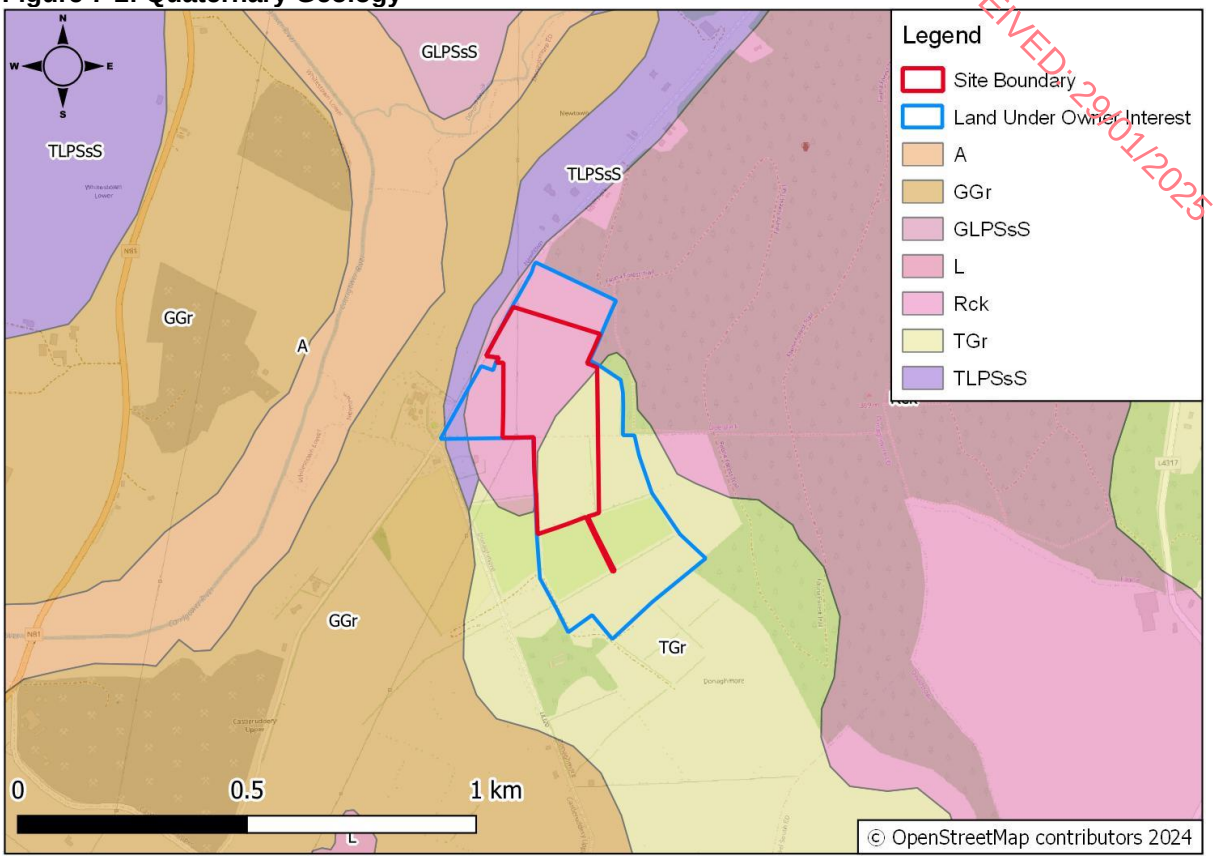


7.3.3 Quaternary Geology

The GSI subsoils map for the area indicated that the subsoil in the northwestern portion of the Site is in an area of bedrock outcrop or subcrop ('Rck') with bedrock close to or at the surface. The subsoils in the southeastern portion of the Site are comprised of till derived from granite ('TGr). Note that these subsoil conditions will be altered and/or lost as part of the overburden stripping activities to enable quarrying on-site, with the operational quarry pit considered an area of bedrock outcrop or subcrop ('Rck') [31].

A local subsoil geology map is shown in Figure 7-2 below.

Figure 7-2: Quaternary Geology



7.3.4 Land Use and Economic Geology

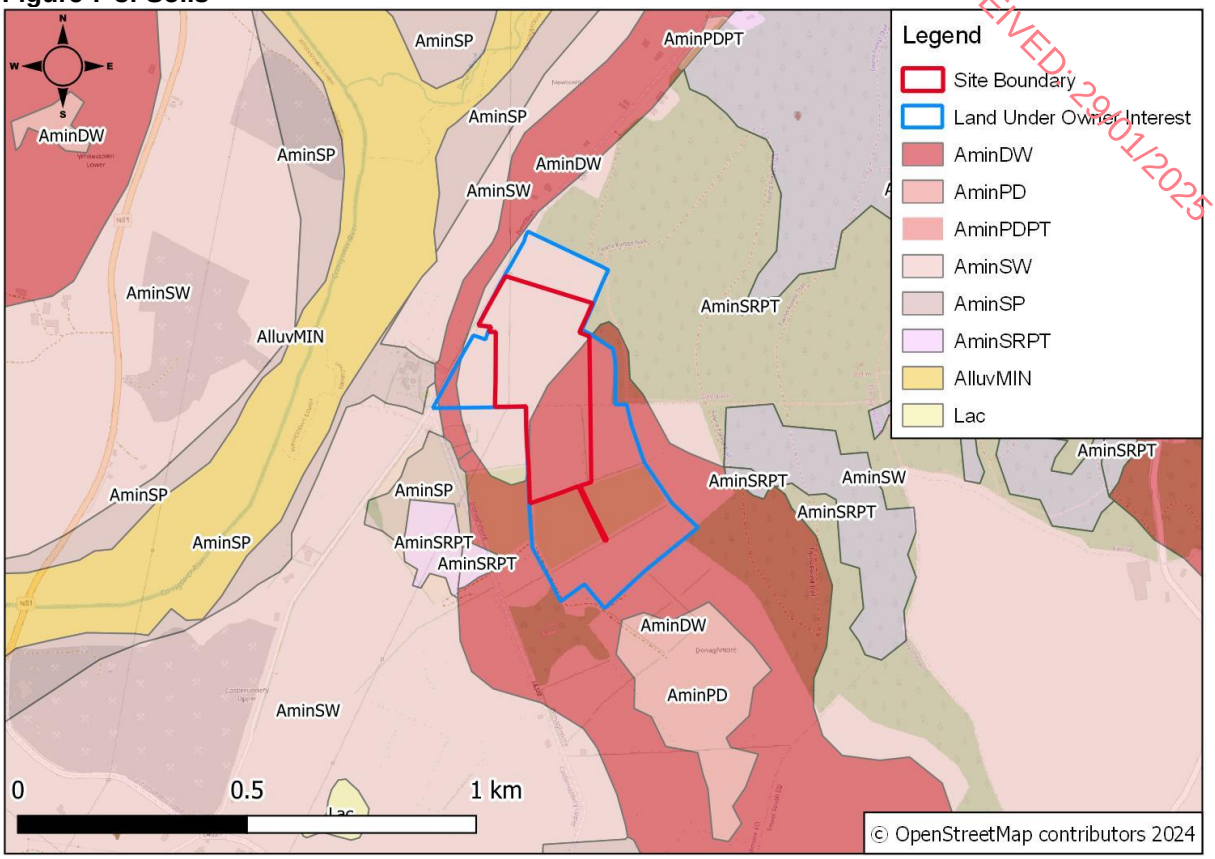
The current land use at the Site, based on the Corine 2018 dataset, is agricultural pasture, with coniferous forest along the north and east borders of the Site. Agricultural pasture also extends to the south and west of the Site .

Based on the aggregate potential mapping datasets within the GSI maps, the western region of the Site is within an area of “very high potential” for crushed rock aggregate. The east and southeast of the Site have lower crushed rock potentials at “high” and “moderate”, respectively [31].

7.3.5 Soils

Based on the GSI map datasets, the soils that lie beneath the northwestern portion of the Site are shallow well-drained mineral (mainly acidic) (AminSW), with the southeastern portion and a small section to the west of the Site comprised of deep well-drained mineral (mainly acidic) (AminDW) [31]. Refer to Figure 7-3 below. Note that these soil conditions will be altered and/or lost as part of the overburden stripping activities to enable quarrying on-site. Should soils be retained for screening and later use in restoration, soil characteristics will have been altered by mixing and reworked during overburden stripping and berm construction. Soils within the quarry pit following the start of operations will be made ground comprised of clays, crushed rock and other material derived from extracted bedrock and quarry processes.

Figure 7-3: Soils



Based on Table 2 of the 2022 IEMA guidance, these soils have a “low” receptor sensitivity derived from the mineral nature of the soils, there agricultural usage and lack of features that would result in a higher sensitivity classification. Utilising Table 3 of the same guidance, the magnitude of impact associated with the removal of soils from Site is classified as “moderate” as operations will result in an “irreversible loss in soil functions” (i.e. characteristics of the soils will be permanently altered, specifically through overburden stripping) between 5 -20ha.

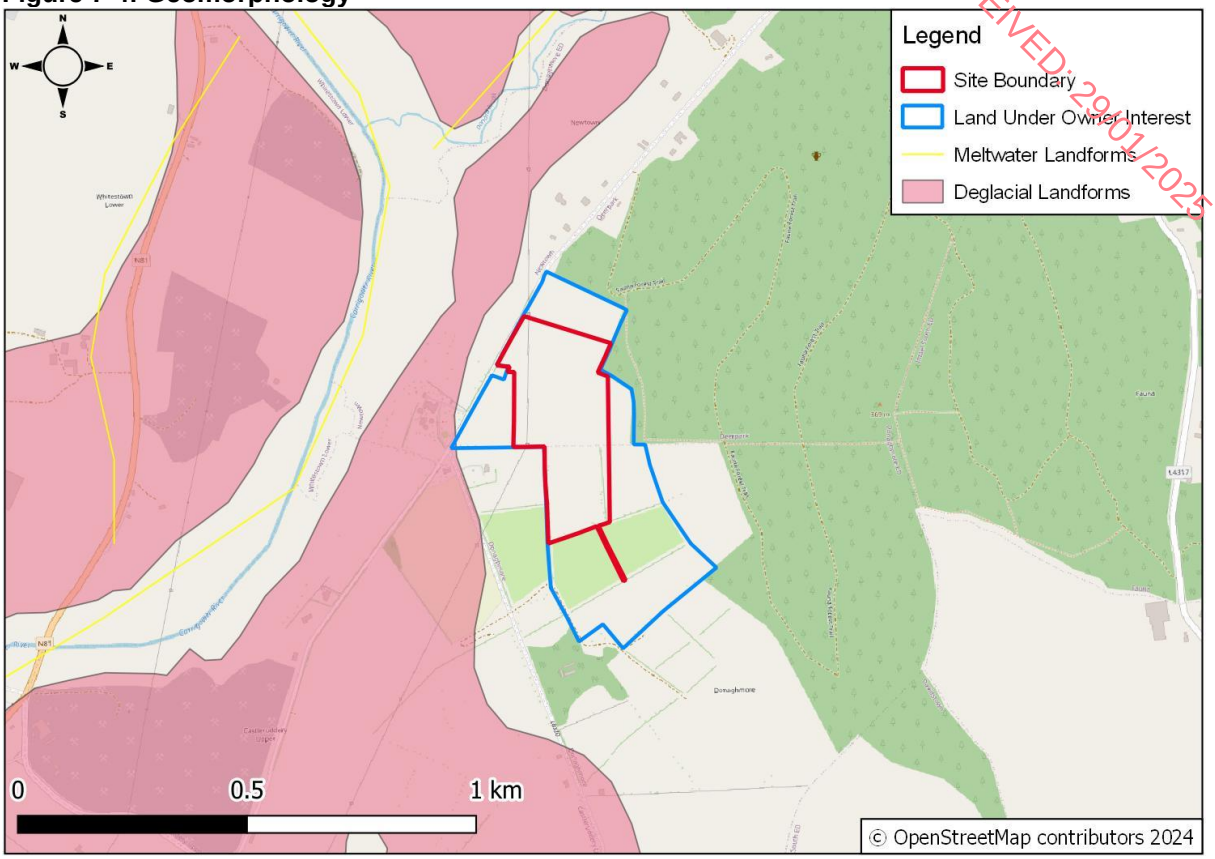
Based on the above classifications, Table 5 of the guidance assigns the significance category of the soil receptor and corresponding impact as “slight”, which under the guidance is deemed to be “not material in the decision-making process”. As such the overall negative impacts to soils associated with the Proposed Development should be considered imperceptible to not significant for the purposes of EIAR assessment.

7.3.6 Geomorphology

According to the GSI database, the majority of the Site does not intersect with any notable geomorphology or glacial landforms. However, there is a small region in the westernmost corner of the Site containing the hummocky sand and gravel deglacial landform. This specific feature extends both north and south of the Site, with the majority of the landform area occurring to the south of the Site [31].

Also in the vicinity of the Site are other regions of hummocky sand and gravel and meltwater channels that locally trend south to southwesterly [31]. The nearest channel is ca. 330m and is aligned along the CARRIGOWER_020 waterbody .

Figure 7-4: Geomorphology



7.4 Characteristics and Potential Effects of the Proposed Development

The Proposed Development consists of the re-commencement of an old rock quarry along with the extension of the quarry into reserves to the south and east of the old quarry. The northern area of the Site is located within the existing quarry, which was previously subject to quarrying activity and, therefore, has been completely stripped of overburden. To date, old quarrying activities within this existing quarry have extracted material to a depth of 165mAOD in some areas. The proposed extension lands located primarily to the south and east comprise areas of scrub and improved agricultural grassland. The Proposed Development seeks to quarry this additional land which covers an area of 5.01ha to ca. 165mAOD. In order to extract the bedrock from the proposed extension lands, the stripping and removal of soils and topsoil above the bedrock will be required. To minimise the area of exposed ground, the removal of soils and overburden will be done on a phased basis, as required by the quarry operator. These soils would then be utilised in the construction of peripheral screening berms along the boundaries of the Site. These berms will be vegetated to aid screening, with the vegetation providing stabilisation that will help prevent erosion from the berms. A rough volume estimation has been calculated for the overburden present at the Proposed Development and was solely based on-site specific data (i.e. borehole installation). BH02, BH03, BH04, BH06 and BH07 have been utilised for the volume calculation. BH01 and BH05 were not utilised since they fall outside of the proposed extraction area. A volume of ca. 112,500m^3 of overburden may need to be excavated for use in the peripheral berms at the Site.

It is intended to grade and landscape the quarry faces with the use of layers of soil to create a growing medium for additional vegetation planting during the restoration stage of the Proposed Development. However, restoring the land to previous agricultural use is not envisaged as it will potentially result in a singular habitat with limited diversity. As a result, the Proposed Development represents a slight permanent negative effect on the local soils as original soil conditions will be altered, and the original topography of the soils will not be

restored. Based on Table 2 of the 2022 , these soils have a “low” receptor sensitivity, based on the predominantly mineral nature of the soils, the lack of archaeological interest and the lack of community, recreational and educational usage of the land.

The extraction area of the Proposed Development extends to an area of 5.1ha of undisturbed agricultural soils which will be impacted during the quarrying activity. As such, utilising Table 3 of the same guidance, the magnitude of the impact associated with the removal of soils from the Site is “Moderate” as the Proposed Development would result in the loss of agricultural pasture soil function over an area of between 5-20ha, which could be reversed through restorative infilling, although this approach is not envisaged at this point. Therefore, under Table 5 and Table 6 of the guidance, the impact of the soil removal will be negative and slight, which is considered “not material in the decision-making process” by the guidance. Under EIAR guidance, the overall impact will be slight, negative, and permanent in relation to land and soils without the proper mitigation measures .

The Proposed Development will result in changes in the land use from agricultural pasture to a ‘mineral extraction’ site during the operations of the Proposed Development. Water arising from the Proposed Development will be collected by gravity into two settlement ponds which will be located within the old quarry area to the north of the Site. These ponds have a capacity of ca. 2500m^3 each. Surface water run-off from the Site will percolate to the ground or, during heavy rainfall events, will be directed and collected within the settlement ponds. Drainage is further assessed in Chapter 8 - Water (Hydrogeology and Hydrology).

However, during the restoration stage of the Proposed Development, once the operations have ceased, no reinstatement of soils to restore the quarry to its original agricultural state is planned. Following the closure and restoration of the Site, the Proposed Development will change the land use from a mineral extraction site to a vegetated area providing different habitats, including woodland areas, retained and re-planted treelines, ponds, etc.

Overall, these changes in land use represent a neutral effect, with the land providing different benefits dependent on use. However, considering the size of the Site relative to the availability of agricultural pasture in Ireland, there will be an imperceptible negative effect on the available agricultural pasture following restoration.

To carry out the works at the Proposed Development, heavy machinery will be required. As such, fuels and hydrocarbon oils utilised by this machinery could potentially pose a risk to land and soils from a hydrocarbon release. This could result in a significant negative effect on soils and geology that are exposed and as such, the appropriate mitigation measures outlined below will minimize the risk of occurrence and effects on soils.

7.5 Proposed Mitigation Measures

The mitigation measures for the protection of soils and geology, as well as the protection of surface water and groundwater, which are related to the soils and geology, are described below and in Chapter 8 (Water).

7.5.1 Oil Storage / Refuelling

There will be no fuel store on-site for vehicles or quarry plant equipment. During preparatory and operational works at the Proposed Development, the usage of fuel-powered equipment and machinery will be required. The employment of good environmental management practices will serve to minimise the risk of pollution from the extraction activities at the Proposed Development. Therefore, mitigation measures will be in accordance with the EPA (2006) Environmental Management Guidelines: Environmental Management in the Extractive Industry (Non-Scheduled Minerals) , whereby:

- Items of plant and machinery will be refuelled by a competent person utilising adequately sized and positioned drip trays;

- Absorbent sands and a fuel spill kit system will be available on-site;
- The wheel wash will be serviced and maintained, including the removal of sediment off-site periodically by a permitted contractor to a licensed facility, to prevent the release of finer sediment, fuels and greases that accumulate over time; and,
- Any hazardous waste, such as lubricant oils and waste oils, will be kept in suitable leak-proof containers and stored temporarily on-site in designated areas; and,
- Waste oils will be collected and recycled/disposed of by an authorised waste contractor in accordance with the relevant waste regulations.

In addition, the following measures will be implemented to prevent contamination release:

- Preventative maintenance and relevant maintenance logs will be kept for all on-site plant and equipment;
- Procedures and contingency plans will be set up to deal with emergency accidents or spills;
- Lubricants and hydraulic fluids for screening equipment used on the Site will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided will spill containment according to best practice codes; and,
- Any spillage of fuel, lubricants or hydraulic oils will be immediately contained, and the contamination removed from the Site and appropriately disposed of.

7.5.2 Soil Management

In addition, stockpiling of the excavated material will be required and will be appropriately managed on-site. All topsoil will be stored in stockpiles, some of which will be used for the remediation stage of the Site. Topsoil removal and storage will be conducted considering best practice guidance from the Department for Environment, Food and Rural Affairs ('DEFRA') (2009) . To minimise the overall impact on soils arising during the construction phase, the following mitigation measures will be adhered to:

- The Proposed Development will be phased over its lifetime which represents different areas of extraction. According to the phases, the volume of overburden to be removed will be as follows:
    - Phase 1 will see the development of the old quarry to its original planned extent and depth, and the creation of the water management system. There will ca. 8,500m^3 of soil removal during this phase taking into account the average thickness of overburden present during the site investigations at BH03 and BH04 (ca. 2.5m) over an area of ca. 3,400m^2;
    - Phase 2 will extend the quarry south along the western boundary. This phase is on the lower elevation ground and will benefit from the berm creation to the west. An estimated volume of ca. 50,000m^3 of soil will be removed in this phase of work taking into account the average thickness of overburden present during the site investigations at BH04 and BH07 (ca. 2.5m) over an area of ca. 17,000m^2;
    - Phase 3 will complete the southern extent of the Proposed Development along the western boundary. The western berms will be established with tree development improving the visual screening. An estimated volume of ca. 54,000m^3 of soil will be removed in this phase of work taking into account the average thickness of overburden present during the site investigations at BH02, BH06 and BH07 (ca. 2.7m) over an area of 20,000m^2; and,

  - Although each phase of development is shown as a distinct element, operationally it will be necessary to commence the next phase prior to the completion of a phase of development.

- The structure of the soil will be disturbed as little as possible to maintain its quality – the topsoil layer will be stripped out and stored separately in stockpiles to maintain its functional use for restoration and landscaping. The subsoils layer will also be stripped out and stored in different stockpiles to maintain the structure as much as practicable;
- Soil stripping and stockpiling will not take place during particularly dry or wet weather. This will minimise damage to the soil structure;
- The stockpiles will clearly be defined to differentiate soil materials;
- Unnecessary soil compaction in the berms should be avoided to limit the development of anaerobic conditions in soils at the centre of the berm;
- The traffic movement will be confined to designated routes;
- There will be no soils removed off-site;
- Berms should be seeded as soon as possible to ensure the stability of the stockpiled soil;
- Silt fencing will be installed where required to prevent the erosion of berms into the quarry pit and water management ponds; and,
- Berms will be dampened down during dry periods to prevent wind dispersion until planting has been established.

7.6 Cumulative and In-combination Effects

It is not considered that the Proposed Development will have any significant impacts on hydrology, hydrogeology, soils and geology, provided that the above mitigation measures are implemented. It is, therefore, unlikely that the Proposed Development will have any significant cumulative or in-combination effects.

7.7 Interactions with Other Environmental Attributes

Land Use, Soils and Geology interact with other environmental attributes as follows:

- Chapter 6 - Biodiversity: The alteration of soil conditions on-site through the removal of topsoil and extraction of bedrock are key elements to the viability of this project. However, this may affect biodiversity. The effects on biodiversity are addressed in Chapter 6 in more detail;
- Chapter 8 - Water: The removal of the soils will alter the sensitivity of the underlying groundwater. Further assessment is provided within Chapter 8 Water. Additionally, soil reworking and bedrock extraction could release suspended solids and other material which will be controlled by the two settlement ponds located within the old quarry area to the north of the Site. The effects on water quality are addressed in Chapter 8;
- Chapter 9 - Air Quality: the mobilisation of dust from land, soils, and geology through extraction processes such as blasting and crushing can impact air quality. The effects on air quality are addressed in Chapter 9; and,
- Chapter 12 - Landscape & Visual. Potential impacts associated with change in land use and topography through the extraction of bedrock on-site will likely impact the visual and landscape character of the area. The effects on visual and landscape character and the integration of the Proposed Development within the landscape are addressed in Chapter 9.

7.8 Indirect Effects

No indirect effects are predicted as part of the Proposed Development.

7.9 Residual Effects

Provided that the mitigation measures and factors listed in Section 7.5 above are followed, the residual effects on soils as a result of the on-site extraction are likely to be slight irreversible long-term negative effects. This is due to the permanent alteration of the original soil character from the baseline conditions to a new character derived from the reworking of soils and subsoils during the stripping of the overburden. During each phase of the operational phase, it is intended to remove the topsoil and subsoils. This material will be utilised in the creation of the boundary embankments/berms and planted with native species to stabilise the berms.

There is no plan to restore the Site to its agricultural use or to infill the final quarry void. Therefore, during the restoration stage, the original topography of the Site will not be restored. Instead, the restoration plan will permit a mixture of habitats, including vegetation, to allow a range of species to populate the remediated site.

The final condition of the Site following restoration will be a quarry pit floor surrounded by vegetated regions as per the Restoration Plan (Appendix 6-1). As such, the land will not be suitable for agricultural purposes. Considering the size and the relative availability of agricultural pasture in Ireland, restoration will result in an imperceptible negative effect on the available agricultural pasture. However, the proposed restoration will present an alternative mix of water, cliff face and bench and boundary planting, which will be a valuable non-anthropogenic land use; refer to Chapter 6 Biodiversity.

7.10 Monitoring

No monitoring of geology and soils is planned during the Proposed Development.

7.11 Reinstatement

The restoration phase of the Proposed Development will be undertaken in phases. Subsoils and topsoils stored on-site will be spread across the quarry floor, changing its land use, and will leave ca. 2.4-3m depth of soils across the quarry floor based on current calculations from on-site boreholes. This will allow for natural regeneration of vegetation to occur.

The restoration phase of the Proposed Development will provide a mosaic of habitats, including woodland areas, boundary vegetation, retained and re-planted treelines, ponds, bare ground scrapes / unvegetated quarry benches and areas of recolonising bare ground.

7.12 Difficulties Encountered

No difficulties were encountered in undertaking this assessment.

8 WATER (HYDROGEOLOGY AND HYDROLOGY)

8.1 Introduction

This chapter of the EIAR provides a description and assessment of the likely impacts of the Proposed Development on surface water quality in the vicinity of the Site and groundwater quality beneath the Site.

8.2 Methodology

The methodology for the hydrogeology and hydrology chapter of this EIAR is designed to evaluate the potential impacts of the Proposed Development on water resources, including surface water systems, groundwater resources and hydrological processes.

8.2.1 Legislation Context

The EU Water Framework Directive (2000/60/EC) ('WFD') establishes a comprehensive framework for the protection of both surface water and groundwater resources . In Ireland, this directive has been transposed into national law through the European Communities Environmental Objectives (Surface Water) Regulations 2009, as amended (S.I. No. 792 of 2009). The WFD sets out the measures required for water protection and management to ensure that water bodies achieve and maintain 'Good' or 'High' status where applicable, while preventing any deterioration in their current condition. Water bodies include both surface water and groundwater systems, with the attainment of 'Good' status dependent on achieving high standards in water chemistry and the health of dependent ecosystems.

The first cycle of the River Basin Management Plan ('RBMP') ran from 2009-2015; plans were devised for all the River Basin Districts ('RBDs') with the objective of achieving at least 'Good' status for all waters by 2015. The second cycle of the River Basin Management Plan covered the period 2018-2021, which merged the multiple RBDs to form one national RBD .

Public consultation on the draft of the third cycle of the RBMP for 2022-2027 has concluded, though the final version has yet to be published. During the development of the third cycle, cooperation with the Northern Ireland ('NI') authorities occurred to support an all-island approach to water resource management. As part of this approach, the island of Ireland has been divided into four RBDs: one RBD fully within the Republic of Ireland ('ROI'), two cross-border RBDs shared between ROI and NI, and one RBD entirely within NI . A detailed assessment relating to the WFD is provided in Appendix 8-1.

The assessment was carried out in accordance with the following guidance and tailored accordingly based on professional judgement:

- Institute of Geologists Ireland ('IGI') Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements;
- CIRIA C532 - Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors ;
- Department of Environment, Heritage and Local Government: Quarries and Ancillary Activities - Guidance for Authorities ; and,
- EPA Environmental Management in the Extractive Industry (Non-Scheduled Minerals) .

8.2.2 Desk-based Study

A desk study of the Site and surrounding area was carried out to collate all available and relevant geological, hydrogeological, hydrological and meteorological data for the study area, using the following data sources:

- Geological Survey of Ireland ('GSI') ;
- Environmental Protection Agency ('EPA') Maps database ;
- Environmental Protection Agency ('EPA') Catchments ; and,
- Office of Public Works ('OPW') 'Flood Maps' .

8.2.3 Site Investigations and Environmental Monitoring

An intrusive site investigation was conducted between July and October 2023 to characterise the geological, hydrogeological, and hydrological conditions of the area. The investigation included the following key activities:

Groundwater Investigation

Installation of groundwater wells

- Seven groundwater monitoring wells were installed at specific locations: BH1 in the old quarry (north) and BH02–BH07 in the extension areas (south and east). Borehole logs are provided in Appendix 7-1; and,
- Well depths ranged from 9mbgl at BH5 to 60mbgl at BH1. Lithological changes and water strike information recorded during drilling (BH06 and BH07) were utilized for determining aquifer characteristics and water table depth.

Topographical Survey

- A topographical site survey was carried out at the Site by SixWest on 24th August 2023, following the installation of the groundwater wells BH1-BH5, in order to survey all locations in reference to Ordnance Datum.

Groundwater Monitoring

Groundwater monitoring was conducted at different locations on specific dates in January 2024:

- BH02 on 8th January;
- BH04, BH06 and BH07 on 9th January;
- BH03 on 10th January;
- BH05 on 11th January; and,
- BH01 on 15th January.

Sampling events included water level measurements, field hydrochemistry analysis (Electrical Conductivity ('EC'), pH and temperature) and laboratory analysis of groundwater samples for a comprehensive range of parameters included in Appendix 8-2.

Aquifer Testing

- Slug tests were conducted at all wells on 31st October 2023 to assess bedrock permeability; and,
- Pump test performed at locations BH02, BH04, BH05, BH06, and BH07 from 8th to 12th January 2024 to evaluate groundwater yield and dewatering requirements.

Surface Water Investigation

Surface water monitoring was carried out at four locations in the vicinity of the Site – A land drain (SW01), upstream of the CARRIGOWER_020 waterbody (SW02 and SW04) and downstream of the CARRIGOWER_020 waterbody (SW03). Surface water samples were collected between the 15th (SW01-SW03) and 18th (SW04) January 2024. Samples collected were assessed for;

- Dissolved Metals: Arsenic, Cadmium, Total Chromium, Copper, Lead, Mercury, Nickel, Zinc;
- Inorganic Parameters: Sulphate as (SO_4), Chloride, Orthophosphate as (P) and Ammoniacal Nitrogen as (NH_3); and,
- General Water Quality: Biochemical Oxygen Demand ('BOD'), Chemical Oxygen Demand ('COD'), EC, pH, Total Dissolved Solids ('TDS'), Total Nitrogen as ('N') and Total Suspended Solids ('TSS').

8.2.4 Impact Assessment Methodology

A conventional source-pathway-receptor model for groundwater / surface water protection is applied to assess impacts on groundwater and surface water, specifically on downstream sensitive ecological receptors and local groundwater supplies, providing a preliminary framework to assess impacts in line with Section 1.7 and 1.8 of this report.

8.3 Receiving Environment

The following sections discuss the water in relation to the Site. Groundwater and surface water are discussed separately in hydrogeology and hydrology sections below.

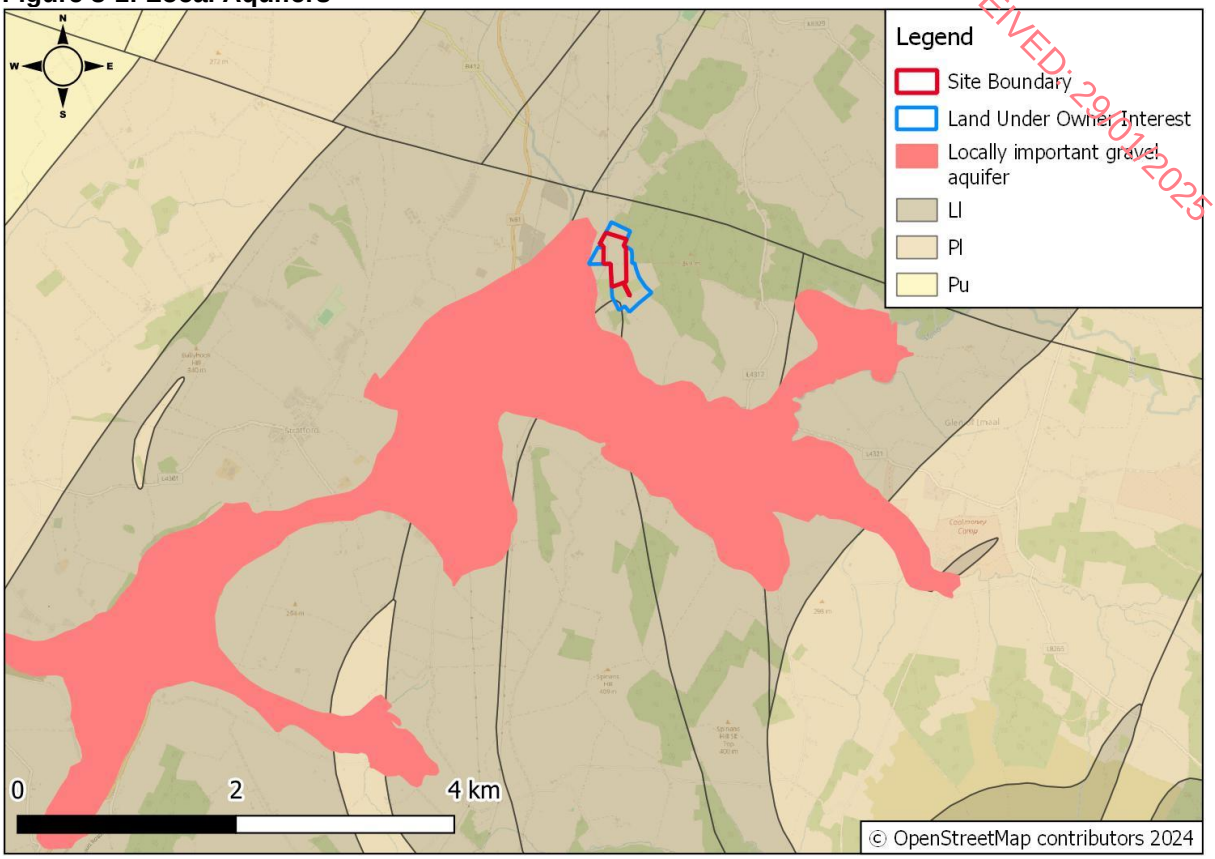
8.3.1 Hydrogeology

This section describes the groundwater features in the area and those which are potentially relevant to the assessment.

8.3.1.1 Local Aquifer

The GSI bedrock aquifer indicates that the entire Site is underlain by a Locally Important Aquifer – ('LI') – Bedrock which is Moderately Productive only in Local Zones. There is a Locally Important Gravel Aquifer associated with the gravels derived from granite ('GGr') shown in Figure 7-2 above. There are no karst features mapped within a 5km radius from the Site. See Figure 8-1 below.

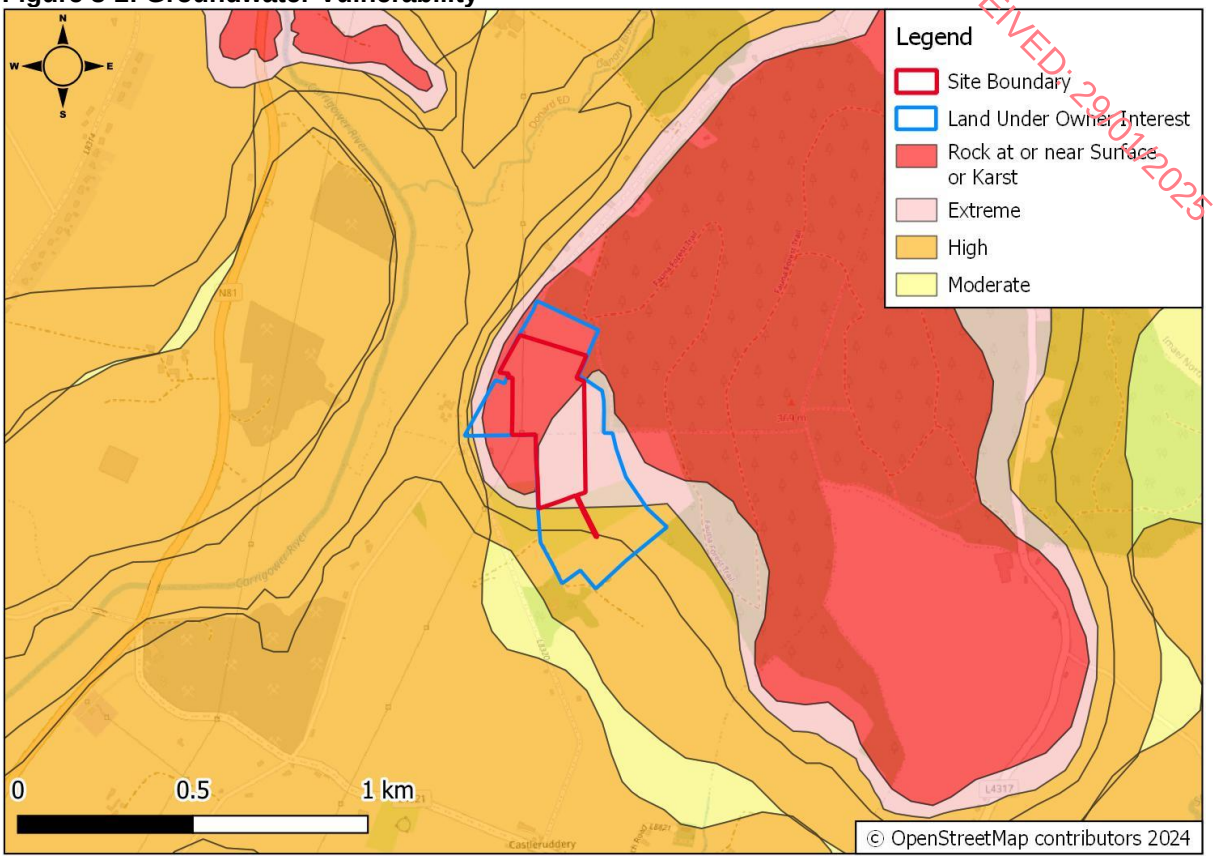
Figure 8-1: Local Aquifers



8.3.1.2 Groundwater Vulnerability

Groundwater vulnerability provides a measure of the ability of contaminants to migrate vertically to an aquifer and is a function of the subsoil permeability and its thickness . From the GSI dataset, the northwestern area of the Site is classified as having Rock at or near Surface (X), with the southeastern area classified as Extreme (E) vulnerability.

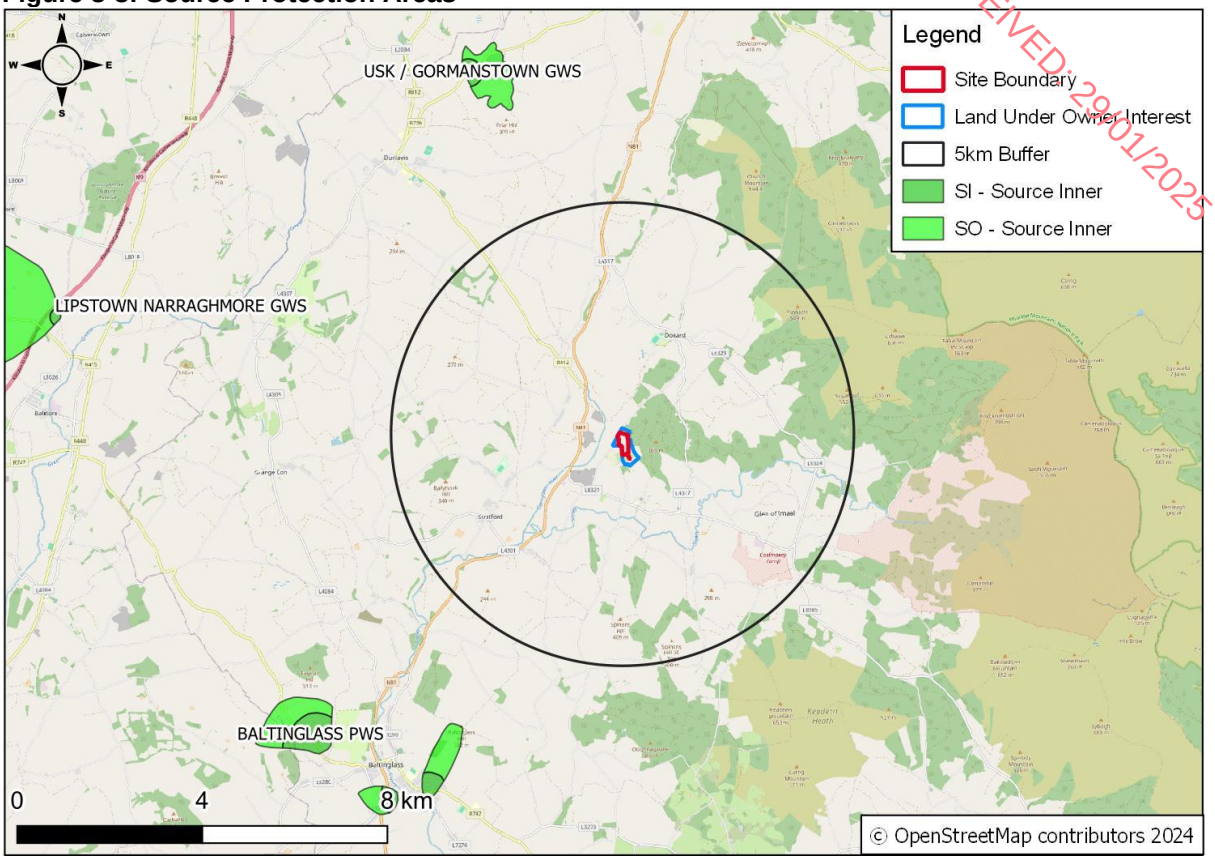
Figure 8-2: Groundwater Vulnerability



8.3.1.3 Groundwater Protection and Use

Groundwater Protection Schemes provide a framework for the protection of groundwater source zones (i.e. areas of contribution to water supply wells). There is no source of protection areas within 5km of the Site. The nearest source protection area is the Source Outer ('SO') area for the Baltinglass PWS, located ca. 6.87km southeast of the Site. Refer to Figure 8-3 below.

Figure 8-3: Source Protection Areas



A search of the GSI groundwater well database was conducted to identify registered wells within a 2 km radius of the Site. The search identified eight registered wells within this area. Details are provided in Table 8-1 below.

Table 8-1: Available Groundwater Well Information

Borehole ID	Centre Distance from Site	Grid Reference (Irish Grid)	Well Type	Source Use	Total Depth (m)	Townland	Yield (m^3 per day)
2919SWW004	1.62km SE	292950 193750	Dug well	Domestic only	1.5	Davidstown	-
2919SWW005	1.73km SE	292950 193690	Dug well	Domestic only	2.1	Davidstown	-
2919SWW006	1.68km SE	292950 193660	Dug well	Domestic only	0.9	Davidstown	-
2919SWW011	1.54km SE	293560 194440	Dug well	None listed	0.9	Kelshamore	-
2919SWW008	1.81km SW	290120 194580	Dug well	None listed	10.7	Randalstown	33
2919SWW010	1.73km NW	290280 196200	Dug well	None listed	3.7	Whitestown Upper	-
2919SWW022	2.37km NW	290260 197300	Borehole	Domestic only	43.6	Raheen	55
2919SWW025	1.24km SW	291060 194280	Borehole	Domestic only	39.6	Castleruddery Lower	30

8.3.1.4 Groundwater Levels and Flow Direction

Manual groundwater level measurements were recorded during each sampling event and are presented in Table 8-2 below. The data indicates that the groundwater gradient (flow direction) across the Site is predominantly east to west.

Table 8-2: Site Groundwater Measurements

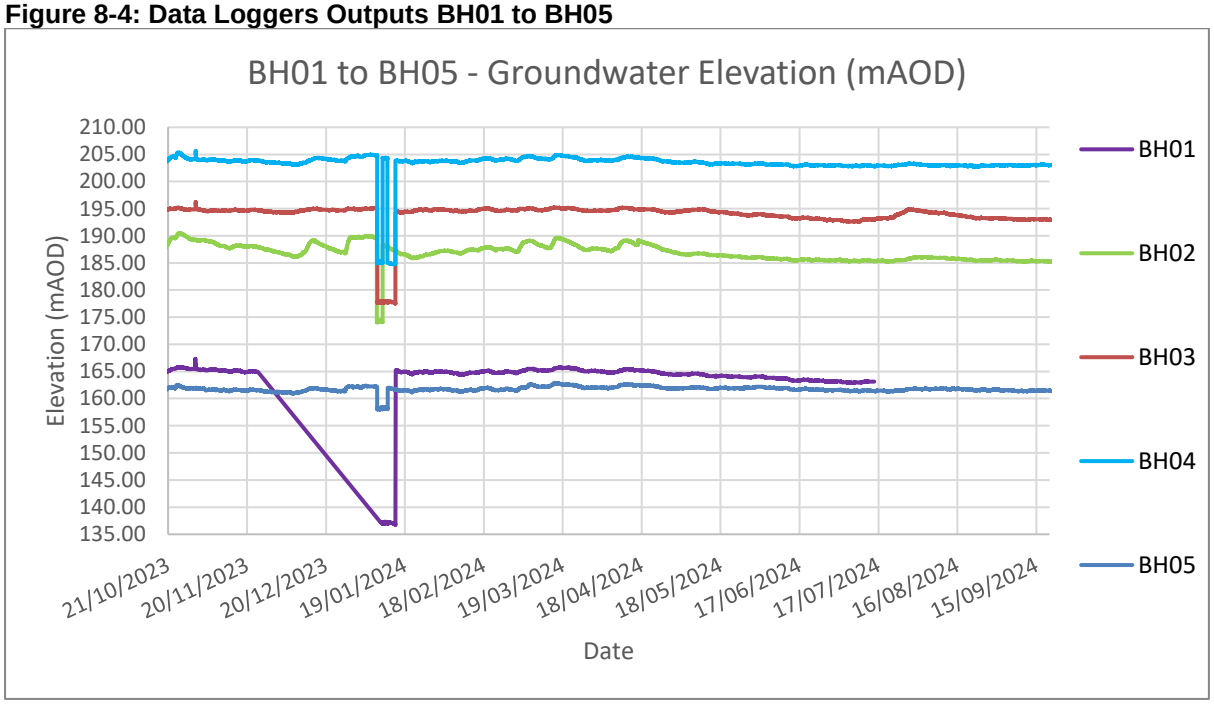
Measured Parameter		Elevation of Reference (Top of Casing)	Elevation of Reference (Ground Level)	Water Level									
Units		mAOD	mAOD	Dates Measured									
				23/08/2023		31/10/2023		08-15/01/2024		24/09/2024		2/10/2024	
				mbtoc	mAOD	mbtoc	mAOD	mbtoc	mAOD	mbtoc	mAOD	mbtoc	mAOD
Well ID	BH01	167.3	166.6	4.95	162.37	2.85	162.37	3.32	164.00	5.99	161.33	6.07	161.25
	BH02	199.5	198.7	16.6	182.87	8.48	190.99	8.52	190.95	13.25	186.22	13.38	186.09
	BH03	202.8	202.3	4.1	198.73	2.2	200.63	2.43	200.40	4.73	198.10	4.64	198.19
	BH04	210.1	209.6	9.65	200.42	4.85	205.22	4.63	205.44	6.39	203.68	6.36	203.71
	BH05	165.2	164.7	7.2	158.03	3.05	162.18	3.38	161.85	5.3	159.93	5.38	159.85

In addition to on-site measurements, data loggers were installed in groundwater wells BH01 to BH07 to assess groundwater levels and to capture the seasonal changes in the water table from winter to summer. Date loggers were in installed at BH01 between 13th October 2023 and 15th July 2024, BH02 to BH05 between 13th October 2023 and 24th January 2024, BH06 and BH07 between 31st October and 24th January 2024. As groundwater well locations BH01 – BH05 were surveyed with reference to mAOD, groundwater elevation in wells BH01 to BH05 was presented as mAOD, as illustrated in Figure 8-4 below. Groundwater elevation recorded by the data loggers, shown in Figure 8-4, was relatively consistent with field measurement collected as shown in Table 8-2.

The groundwater elevation in wells BH01 to BH05 exhibit a relatively consistent pattern across the monitored locations, suggesting a stable hydraulic gradient in the area. However, BH02 stands out with more pronounced variations in water levels compared to the other wells. The recorded changes in BH02 range between ca. 185 mAOD and 190 mAOD, indicating localised influences or variations in hydrogeological conditions that could be attributed to factors such as recharge, discharge, or subsurface heterogeneity specific to the vicinity of BH02.

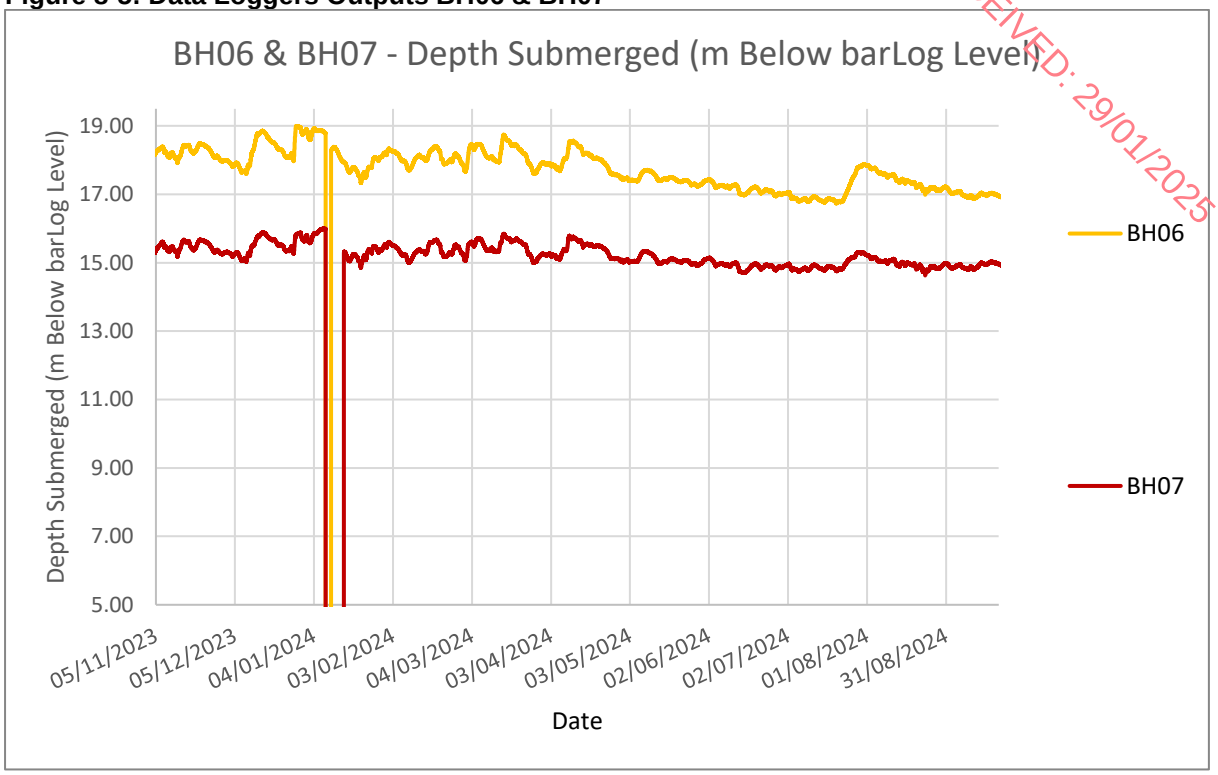
Significant variations in groundwater level trends were observed in the wells, corresponding to the movement or repositioning of data loggers during the monitoring events conducted in October 2023, as well as in January, July, and August 2024. The data logger in BH01 experienced a malfunction in November 2023 and was rectified in January 2024.

Figure 8-4: Data Loggers Outputs BH01 to BH05



Since Boreholes BH06 and BH07 were not surveyed to reference mAOD, they could not be referenced to mAOD. Instead, the groundwater level measurements from these boreholes are referenced as depth submerged, expressed in meters below the barometric logger ('barLog') level as shown in Figure 8-5 below. A data logger works in groundwater wells by using a pressure sensor to measure changes in water levels. It records the pressure exerted by the water column above it and compares it to atmospheric pressure (recorded separately by a barLog). This allows the calculation of the depth submerged, providing accurate water level measurements relative to the barLog's installation point, even without a survey to align with mAOD.

Figure 8-5: Data Loggers Outputs BH06 & BH07

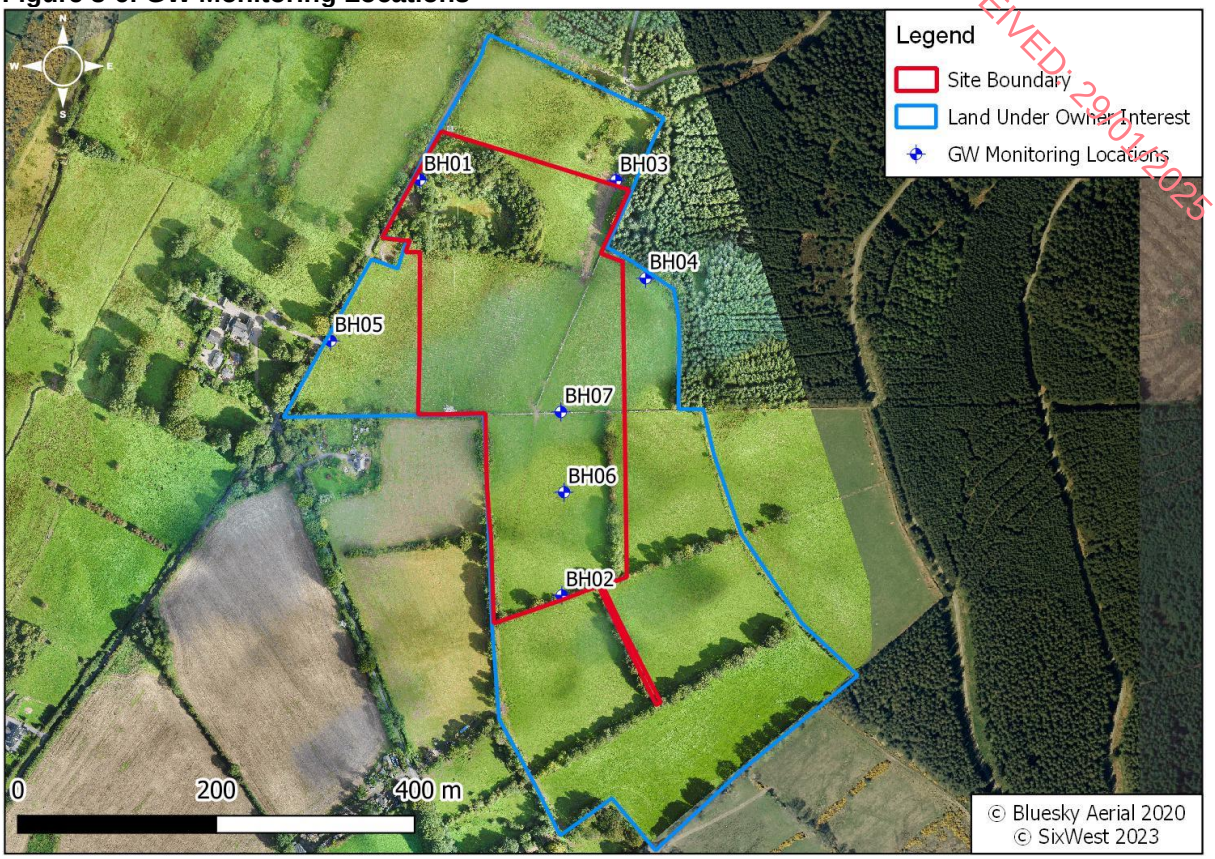


The data indicates no significant changes in water levels during the monitoring period. Among the wells, BH02 exhibited the most notable variation in water levels compared to the others. Wells BH06 and BH07 showed slight variations during the summer monitoring period.

8.3.1.5 Groundwater Monitoring

No historical groundwater monitoring data was available for the Site. To establish baseline conditions, one groundwater sample was collected from each on-site well (BH01–BH07 shown below in Figure 8-6) between 8th January and 15th January 2024. Prior to sample collection, each well was purged of at least three well volumes to ensure the collection of representative samples from the underlying aquifer.

Figure 8-6: GW Monitoring Locations



The laboratory results are presented in Appendix 8-2 and compared with the relevant groundwater Generic Assessment Criteria ('GAC') within the European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No. 9 of 2010 as amended) and the EPA Interim Guideline Values ('IGV').

One exceedance of GAC dissolved nickel limits (15mg/l) was detected at BH03 (15mg/l). One exceedance of lower GAC total ammonium (mg N/l) limits (0.065mg/l) was detected at BH03 (0.12mg/l). All other groundwater samples yielded results below the GAC limits.

Three exceedances below the lower IGV pH limit (6.5 units) were detected during monitoring at BH02 (6.19 units), BH03 (6.43 units) and BH06 (6.41 units). No exceedances of the IGV limits were detected at the other on-site wells during the monitoring event.

These values represent ambient conditions within the groundwater body, as the Site is currently under agricultural use.

8.3.1.6 Groundwater Body ('GWB') Status

The EPA mapping places the Site within the GWB of Ballyglass (IE_SE_G_011). The Ballyglass GWB has a total area of 1397km^2 (139,700ha) . This overall GWB is assigned a "Good" quality status and is considered 'at risk' of failing to meet its WFD objectives under the WFD 2016-2021 monitoring round.

8.3.2 Slug Tests

Seven monitoring wells were installed as shown in Figure 8-6 above, and as described below:

- BH01 – This well was installed on the old quarry floor at the Site;
- BH02 – This well was installed in the most southern field of the Site to assess the presence of groundwater as well as to assess potential effects on water quality during future extraction;
- BH03 and BH04 – These wells were installed along the eastern boundary of the Site to assess the presence of groundwater, as well as to assess potential effects on water quality during the future extraction of those further fields;
- BH05 - This shallow well was installed in the western boundary of the Site to assess the potential volume of groundwater present, if any, in the overburden deposits; and,
- BH06 & BH07 - These wells were installed at the extension lands following the installation of the other five wells to investigate whether the high-yielding rock encountered at BH2 (based on the driller's logs) extended further onto the Site.

Groundwater level measurements at newly installed monitoring wells have demonstrated that quarrying activities within the old quarry have taken place above the water table (refer to Section 8.3.1.4). However, the extraction of the bedrock at the extension lands would intersect the groundwater table – refer to Table 8-2 above.

The slug tests were conducted as a first approach to provide useful values of hydraulic conductivity to assess the permeability of the immediate vicinity of the existing wells.

The Hvorslev method was used to analyse the slug test data as follows:

$$K = \frac{A}{F(t_2 - t_1)} ln\left(\frac{H_1}{H_2}\right)$$

K = hydraulic conductivity (m/min);

A = cross-sectional area of borehole casing or standpipe where water level is changing (m^2);

t1 = Initial time at $H_{1;}$

t2 = Time at some point during the test at $H_{2;}$

H1 = Initial displacement at time $t_{1;}$

H2 = Displacement at time $t_{2;\ an}$

F = intake factor.

One slug test was performed at each well (BH01-BH07). However, due to the nature of the data obtained during the tests, an alternative line fitting was undertaken at the BH02, BH06, and BH07 data graphs. BH06 and BH07 presented an initial steep recovery and then a shallow recovery, whereas BH02 had a more gradual change from steep to shallow, which needed to be accounted for in the analysis.

The calculated hydraulic conductivity is presented in Table 8-3 below and in Appendix 8-3 for the slug test data and calculations.

Table 8-3: Calculated Hydraulic Conductivity – Slug Tests

Well ID	Alternative 1 – K (m/day)	Alternative 2 – K (m/day)
BH1	0.013415	-
BH2	0.27702	1.3555
BH3	0.01568	-
BH4	0.02255	-
BH5	3.56548	-
BH6	0.09490	2.6100
BH7	0.07980	3.4220

The results showed that BH01, BH03 and BH04 had a similar low hydraulic conductivity (0.0134 – 0.0225m/day) and indicated that the bedrock is unlikely to be conveying significant quantities of groundwater. BH05 showed a higher hydraulic conductivity than the other wells (3.565m/day), the same as BH02, BH06 and BH07 (alternative 2), which ranged between 1.355 and 3.5654m/day. However, BH02, BH06 and BH07 (alternative 1) presented lower hydraulic conductivity levels (0.0798-0.2770m/day) in line with those observed in BH01, BH03 and BH04.

A preliminary estimate of groundwater flow entering the quarry has been calculated for the quarry given the assumption that the extraction of the rock will take place down to ca. 165mAOD. Therefore, using Darcy's Law, which is as follows:

$$Q = Kiwb$$

Where:

Q= rate of groundwater flow (m^3/day) – discharge to the quarry floor during quarrying activities;

K= hydraulic conductivity (m/day);

i= hydraulic gradient;

w= length of the quarry (m); and,

b= estimated saturated thickness of the aquifer (m).

The potential groundwater flow rate for the quarry has been calculated for the different hydraulic conductivity values as best and worst-case scenarios. An average K value was estimated as 0.053m/day utilising BH03, BH04, BH06 and BH07 and an average K value was estimated as 3.0m/day utilising BH02, BH05, BH06 and BH07, which were used in the flow calculation. The estimated groundwater discharge has been calculated to range between 7,000m^3/day (3.0m/day x 0.128 x 520m [width of the quarry] x 35m [approximate thickness of the aquifer], i.e. 81 litres per second and 116m^3/day (0.05m/day x 0.128 x 520m [width of the quarry] x 35m [approximate thickness of the aquifer], i.e. 1.3 litres per second.

Due to the variability of the discharge rates (i.e. 81l/s and 1.3l/s) potentially arising from the future quarrying activities, groundwater monitoring wells BH02, BH05, BH06 and BH07 were utilised for pump tests to further assess the behaviour of the rock and potential water availability within the bedrock.

8.3.3 Pumping Test

Pumping tests were performed at BH02, BH05, BH06 and BH07 to provide more accurate estimates of hydraulic conductivity and potential rate of groundwater ingress which may occur during the operational phase of the Proposed Development.

These wells were chosen to represent the range of hydraulic conductivities of the bedrock to allow best and worst-case estimates of groundwater ingress rates to the quarry and due to the uncertainty of hydraulic conductivity obtained during the slug tests. BH04 was also pumped and tested for completeness.

The pumping rate for each well was chosen prior to the tests being conducted using Logan's approximation, whereby:

$$Q = (Ts)/1.2$$

Also, $$T = Kb$$

Where:

Q= discharge rate (m^3/day);

K= hydraulic conductivity (m/day);

b= thickness of saturated screen in well (m);

T= transmissivity (m^2/day); and,

s= target drawdown in well (m).

The hydraulic conductivity (alternative 1 and alternative 2) for each well was obtained from the slug test estimates and the target drawdown was set as the difference between the standing groundwater level and the top of the screened section in the well. Theoretically, this would mean that pumping at the calculated discharge rate would result in the water level in the well reaching the top of the screen.

The estimated calculated rates are shown in Table 8-4 below.

Table 8-4: Discharge Rates – Logan's Approximation

	BH02	BH05	BH06	BH07
Q (l/min)	36.0	25.0	28.0	25.0

The discharge rate was not calculated for BH04, as this well was only pumped tested for completeness and a discharge rate of ca. 5l/min was used during the pumping test.

The constant rate pumping tests (pumping test) were conducted for a period of 2 to 5 hours at each well, following a period of overnight recovery after the pumping test at each well. The pumping tests started on 8th January 2024 at BH02, followed by overnight recovery on 9th January 2024 at BH06, followed by overnight recovery on 10th January 2024 at BH07, followed by overnight recovery on 11th January 2024 at BH05, followed by overnight recovery and on 12th January 2024 at BH04 also followed by overnight recovery.

The initial discharge rates were set as per Table 8-4 above. However, these had to be adjusted in some wells due to the drawdowns achieved during the tests. The discharge rate from the discharge pipe attached to the pump was also measured at intervals during the pumping tests to ensure that the required discharge rate was maintained during the tests.

Table 8-5 shows the actual average pumping and recovery rates used to calculate transmissivity ('T') and hydraulic conductivity ('K').

Table 8-5: Average Flow – Pumping Tests and Recovery Tests

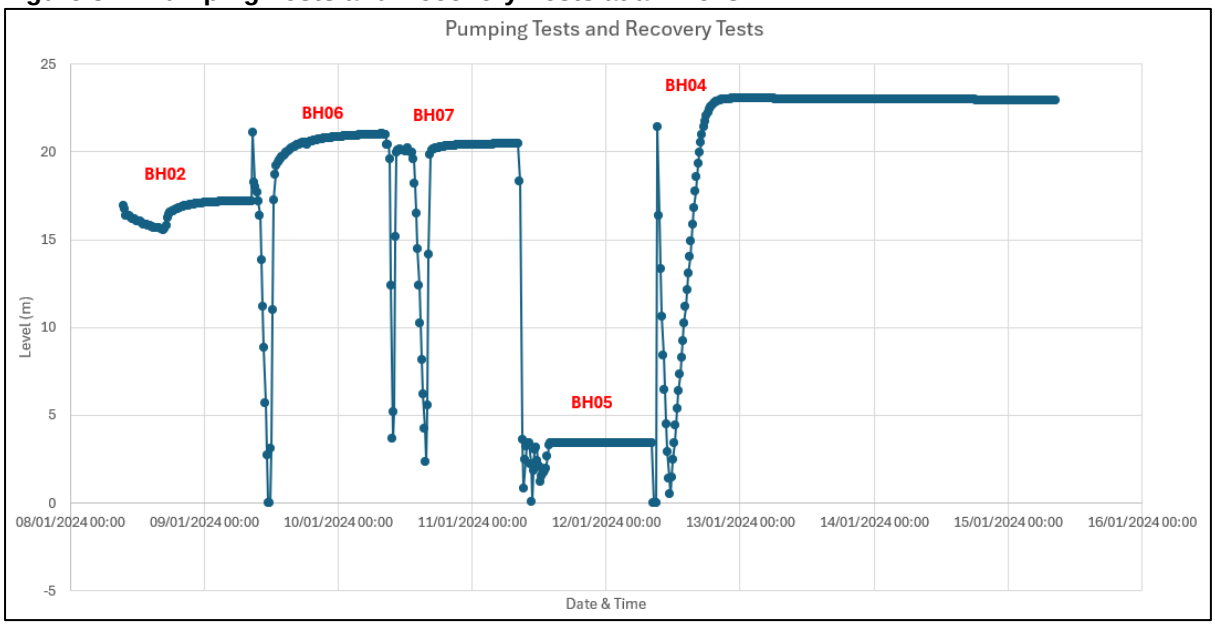
Parameter	BH02	BH04	BH05	BH06	BH07
Flow Rate – Pumping (l/min)	30.0	5.0	3.0	25.0	10.0
Average Flow Rate during pumping test used for Recovery analysis (l/min)	30.0	5.0	2.75	25.0	10.0

Figure 8-7 below shows the changes in water level (y-axis) versus time (x-axis) for each of the groundwater wells through the pumping and recovery periods.

The initial water levels at each well were manually measured before starting the pumping test. During the tests, water levels were also measured at regular intervals. Additionally, data loggers were placed in the pumping well at the start of the test and removed after the recovery period. These data loggers were programmed to record water level changes every 15 minutes to ensure accurate monitoring throughout the test.

The data collected from the pumping well and the monitoring wells during the pumping period were analysed using the Jacob-Cooper Method. This approach involves plotting drawdown against logarithmic time and fitting a straight line to the data to estimate the aquifer transmissivity. Details of the data and corresponding graphs can be found in Appendix 8-4. Hydraulic conductivity was then calculated by dividing the aquifer transmissivity by the saturated aquifer thickness, which was assumed to equal the length of the saturated screen for each test.

Figure 8-7: Pumping Tests and Recovery Tests at all Wells



Hydraulic conductivity and transmissivity values were calculated for each of the monitoring wells during the pumping test.

The calculated values are presented in Table 8-6 below.

Table 8-6: Transmissivity and hydraulic conductivity values – Pumping test

Parameter	BH02	BH04	BH05	BH06	BH07
Transmissivity (m^2/day)	8.1	0.063	0.27	0.14	0.062
Hydraulic Conductivity (m/day)	0.28	0.0014	0.036	0.0042	0.002

The estimated transmissivity (refer to Table 8-7) based on the pumping test data results ranges from 0.062m^2/day at BH07 to 8.1m^2/day at BH02 and an average of 1.73m^2/day transmissivity value. The estimated hydraulic conductivity ranges from 0.0014m/day at BH04 to 0.28m/day at BH02 and an average of 0.065m/day.

Recovery Test

The recovery data from the monitoring wells have been analysed using the Theis Recovery Method. Refer to Appendix 8-5 for the data and graphs.

Hydraulic conductivity (K) and transmissivity (T) values were calculated for each of the monitoring wells during the recovery test (BH02, BH04, BH05, BH06 and BH07). The calculated values are presented in Table 8-7 below.

Table 8-7: Transmissivity and Hydraulic Conductivity Values – Recovery Tests

Parameter	BH02	BH04	BH05	BH06	BH07
Transmissivity (m^2/day)	8.7	0.016	14	1.6	4.1
Hydraulic Conductivity (m/day)	0.3	0.00035	2	0.049	0.13

The estimated transmissivity based on the recovery test data ranges from 0.016 to 14m^2/day and an average of 5.68m^2/day and the estimated hydraulic conductivity ranges from 0.00035 to 2.0m/day and an average of 0.5m/day.

Dewatering Calculations

The hydraulic conductivity estimates derived from the pumping and recovery tests analysis were used to estimate dewatering needs for quarrying of the extension lands. Darcy's law was utilised to estimate the rate of groundwater flow through the greywacke bedrock at different heights (i.e. different benches).

$$Q = Kiwb$$

Where:

Q= rate of groundwater flow (m^3/day) – discharge to the quarry floor during quarrying activities;

K= hydraulic conductivity (m/day);

i= hydraulic gradient;

w= width of the quarry (m); and,

b= estimated saturated thickness of the aquifer (m).

The Site has been divided into two areas: Area 1, which is representative of the conditions present at BH04, BH06 and BH07 and Area 2, which is representative of the conditions present at BH02. To calculate the dewatering volume of water, the average pumping and recovery hydraulic conductivity (K) values were used to calculate K for Area 2. For Area 1, the geometric mean (geomean) for the pumping tests and recovery tests were used to calculate

the hydraulic conductivity value. The geomean is utilised in cases where there is a least an order of magnitude difference in the values obtained, which is the case for this area. Refer to Table 8-8 below for the values used.

Table 8-8: Estimated Hydraulic Conductivity - Average

Parameter	Area 1	Area 2
Hydraulic Conductivity (K) (m/day)	0.0055	0.29

The width of the aquifer has been estimated to be 420m for Area 1 and 100m for Area 2. Refer to Table 8-9 below for the estimated parameters used to estimate the dewatering needs.

Table 8-9: Estimated Site-specific Parameters

Variable	Area 1 (m)	Area 2 (m)
Width of quarry (w)	420	100
Saturated thickness of the aquifer (b)	35	35

A hydraulic gradient (i) of 0.128 has been calculated for the two areas as ([45mAOD (different in contours from BH05 to BH04)]/350m (mapped distance between BH05 and BH04).

The estimated saturated thickness of the aquifer has been estimated for the 35m which is the estimated thickness of the aquifer once the quarry is excavated down to ca. 165mAOD. Refer to Table 8-10.

Table 8-10: Dewatering Calculations

Thickness (m)	Estimated Q (l/sec) values	
	Area 1	Area 2
35m	0.12	1.5

The total groundwater ingress into the quarry (refer to Table 8-10) for the two areas is estimated to be approximately 2l/sec (ca. 178m^3/day).

During year 1, the water management ponds will be commissioned and ready for water management from the beginning of operation; however, discharging from the Site is unlikely until the operation starts in phase 3, which includes Area 2.

8.3.4 Hydrology

This section describes the surface water features in the area and those which are relevant to the assessment.

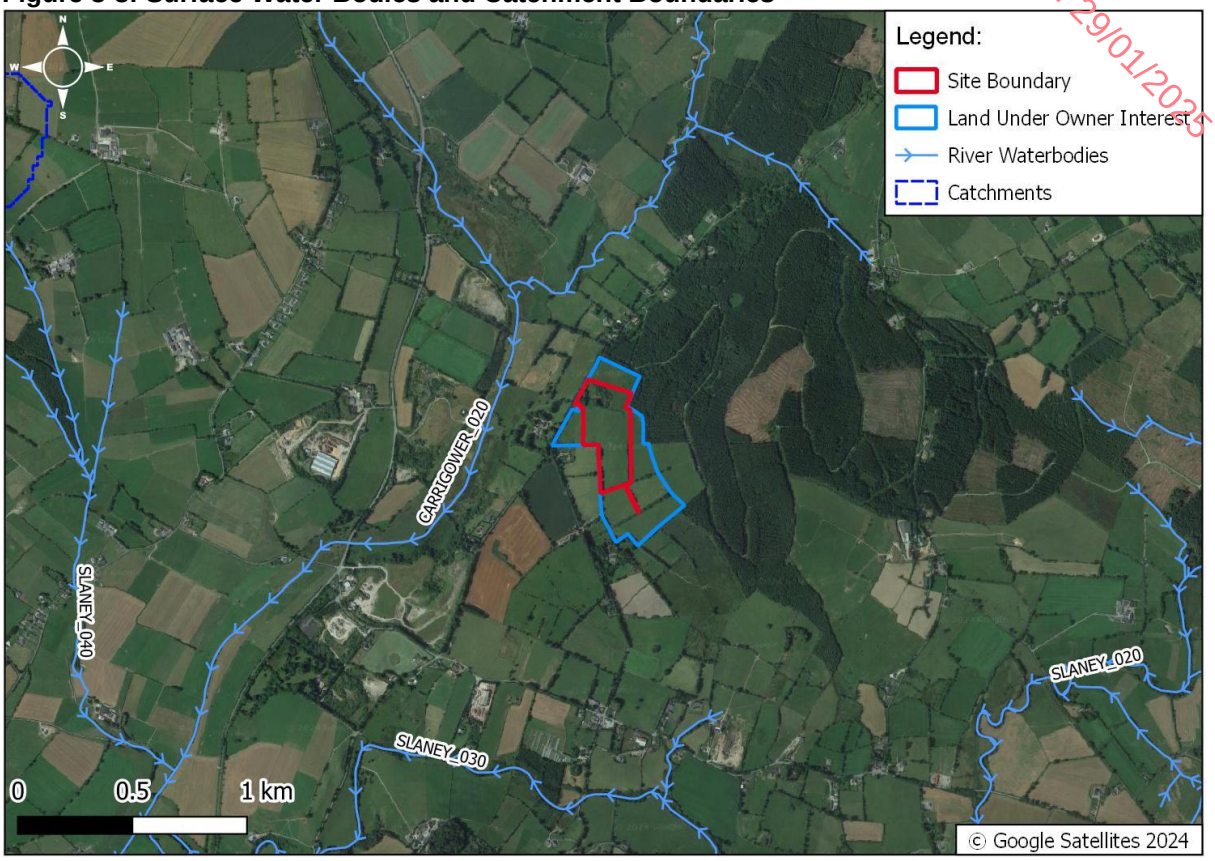
8.3.4.1 Surface Waterbodies

The Site is within the Slaney & Wexford Harbour catchment and the Subcatchment Slaney_SC_010 . The nearest waterbody is the CARRIGOWER_020 waterbody is located ca. 330m west of the Site (see Figure 8-8 below). The CARRIGOWER_020 waterbody is assigned a “Good” status under the WFD 2016-2021 monitoring round and is currently considered “not at risk” of meeting its environmental objectives.

The CARRIGOWER_020 waterbody flows into the SLANEY_040 waterbody ca. 2.9km downstream of the CARRIGOWER_020 waterbody’s closest point to the Site. The SLANEY_040 waterbody is assigned a “High” status under the WFD 2016-2021 monitoring round and is currently considered “not at risk” of meeting its environmental objectives.

Additionally, the SLANEY_040 waterbody is considered a High-Status Objective waterbody and as such the maintaining of the existing "High" status is of key importance.

Figure 8-8: Surface Water Bodies and Catchment Boundaries



8.3.4.2 Flood Risk Assessment ('FRA')

The OPW's Catchment Flood Risk Assessment and Management ('CFRAM') maps , Flood Hazard Mapping, along with historical mapping (i.e. 6" and 25" base maps) were reviewed to assess flood risk in the area of the Site.

CFRAM mapping has been completed for the Site and shows that the Site is not located within any fluvial or pluvial flood zones. There are drainage district channels and benefitted lands located west of the Site, following the course of the CARRIGOWER_020 waterbody. There is no identification of areas that are "prone to flooding" on the available historical 6" or 25" (inch) within the Site boundary.

One flood event and one recurring flood incident were identified within the vicinity of the Site from the OPW's Flood Hazard Mapping (see Appendix 8-6 for a copy of the Past Flood Event Local Area Summary Report for the Site). The flood event is located 2.4km northeast of the Site, occurring in Donard Village. The event is undated, though it occurred before 2005, with the source listed as "runoff". Remediation works are noted to have occurred in 2004; however, no other details are available through the OPW website. The recurring flood event is located 1km southwest of the Site, with the source listed as "river". The OPW notes that the flooding covers lands on both sides of the N81 road.

8.3.4.3 Surface Water Monitoring

Surface water monitoring was carried out on the 15th and 18th January 2024 across four monitoring locations – an upstream land drain (SW01), a downstream section of the CARRIGOWER_020 waterbody (SW02), a downstream land drain (SW03) and an upstream section of the CARRIGOWER_020 waterbody (SW04). Three surface water samples were

collected on 15th January (SW01-SW03), and one surface water sample was collected on the 18th January (SW04).

The laboratory results are presented in Appendix 8-7 and compared with the relevant Surface Water Acceptance Criteria ('SWAC') within the European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I. No. 272 of 2009 as amended). All analytical results reported concentrations at all sampling locations below the SWAC limits.

8.3.5 Overflow Pond

As noted in Section 3.2 above, to prevent overflow of water management ponds on-site, procedures to discharge excess stormwater to land drainage are planned and connected to a pond within fields south of the Site. Based on Figure 8-8 above, this pond is not a surface waterbody recognised by the EPA under the water framework directive and, as such, is not assigned a quality or risk status.

Within Chapter 6 (Biodiversity) of this report, the pond is considered an artificial habitat, with no identified aquatic species present. It is noted to have shallow pools of water and limited flow from the connection to land drainage in the most recent survey of the pond. The estimated area of the pond is approximately 0.4ha.

A review of aerial photography and details from a previous survey of the pond indicate that the water level fluctuate. Additionally, the groundwater vulnerability beneath the pond area is identified as "High", and therefore it is likely that the pond is percolating to groundwater. Within the context of the aquifer regime described in Section 8.3.1, there is likely a connection to the surface water through groundwater flow.

8.3.6 Designated Ecological Sites

There are two SACs located within 5km of the Site. The nearest SAC is a section of the Slaney River Valley SAC associated with the CARRIGOWER_020 waterbody, located ca. 330m to the west, although sections of the SAC are also located to the south and east of the Site. The NPWS does not consider this SAC to be groundwater dependent.

The second SAC is the Wicklow Mountains SAC, located ca. 4.4km northeast of the Site. Additionally, the protected Salmonid waters of the River Slaney are connected to the CARRIGOWER_020 waterbody, ca. 2.9km downstream from the CARRIGOWER_020 waterbody's closest point to the Site.

Further discussion of the ecological sites in the vicinity of the Site can be found in Chapter 6 of this EIAR.

8.3.7 Wastewater

As part of on-site hygiene facilities, a toilet and sink will be constructed on-site. Wastewater produced by these facilities will be retained on-site, which will be specifically constructed for the facility. This system will be emptied on an as-needed basis by appropriately qualified waste contractors. No foul discharge to ground or water will arise at the Site.

8.4 Characteristics and Potential Effects of the Proposed Development

8.4.1 Groundwater

The removal of overburden / soils during the Proposed Development to extract bedrock aggregate will result in an increase to the vulnerability of the bedrock aquifer. However, the majority of the Site is already at the highest vulnerability status (Rock near / at the surface), with a small section on the western edge of the Site and the southeast of the Site being at the second highest vulnerability status (Extreme). The Proposed Development will increase the vulnerability in these Extreme areas through the exposure of bedrock throughout the quarry operations. However, within the context of the GWB, the total extractable area of the Proposed Development (5.01ha) represents ca. 0.005% of the area of the GWB, with the changes in

vulnerability forming only part of that 0.005%. Therefore, the increased vulnerability represents only an imperceptible negative effect to the vulnerability of the underlying GWB for the duration of bedrock exposure without mitigation.

The groundwater quality measurements taken at the Site show that groundwater quality beneath the Site is mildly impaired in relation to dissolved nickel, total ammonium and pH but is largely compliant with groundwater regulatory limits. The proposed plan for on-site water (comprising surface water run-off, groundwater seepage and rainwater) is to allow the on-site water to percolate to ground, with any water excess to be directed to the water management ponds, set into the quarry floor (Section 3.4.4). These water management ponds will retain water and allow water to evaporate. Water levels within the water management ponds will be maintained and inspected on a regular basis to ensure that there is sufficient capacity in the water management ponds to facilitate a storm event. At high water levels, such as during a storm event, to prevent overflowing of the water management ponds, excess water will be pumped through an overground pipe into the existing land drainage system, which will flow to the south of the Site (See Section 3.2), discharging into the off-site pond.

The water management ponds on-site will retain water for evaporation, pumping and discharge to land drainage. As such, suspended solids will collect and deposit within these ponds, which has the potential to partially or fully dissolve into the collected water during retention, enriching the water in minerals / ions when combined with evaporation. These enriched waters could result in negative effects on the local groundwater; however, given the small area of the retention ponds, it is considered any such effects will be local and slight. Water pumped to the overflow pond will also percolate to groundwater. Given the overflow, the pond represents ca. 0.0003% of the area of the GWB; any minerals / ions exported to groundwater will be readily assimilated into the overall GWB, and any negative effects arising will be local and slight.

Additionally, heavy machinery will be required in order to carry out the works at the Proposed Development as in any quarry. As such, fuels and hydrocarbon oils utilised during these operations may pose a significant hazard to groundwater from a potential spill. However, an incident response procedure will be in place to swiftly contain and mitigate such incidents. On-site spills will be contained and disposed of appropriately using a fully licensed waste contractor so that further contamination is reduced. Further mitigation measures will be implemented that will limit the magnitude of any impacts should such a spill or release occur. As such mitigation will be required to reduce the risk of such a spill or release from occurring. Additionally, operational procedures will be implemented on-site to provide measures that will limit the magnitudes of any impacts should such a spill or release occur.

Groundwater abstraction on-site will be restricted to a single well that will act as a water supply for the welfare facilities and as a water supply for the wheel wash during periods off prolonged dry weather. These activities will be supplemented by water held within the water management ponds on-site. It is not predicted that these facilities will result in notable pressures on groundwater availability, having an imperceptible negative impact on groundwater availability.

Beyond the local scale, the Ballyglass GWB has a “Good” quality status under the Water Framework Directive but is considered “at risk” of not achieving good quality status in the next directive cycle. It is likely the Proposed Development to result in, at most, imperceptible to not significant negative impacts on the Ballyglass GWB, due to the Site comprising an area of 8.1, representing only ca. 0.009% (to 3d.p.) for the total area (ca. 139,700ha) of the GWB.

The estimated total groundwater ingress into the quarry for the two areas (Area 1 and Area 2 – Refer to Section 8.3.3 above) is estimated to be approximately 2l/sec (ca. 178m^3/day). Given that the closest groundwater well recorded in the GSI mapping tool online is ca. 1.24km southwest of the Site and the fact that the groundwater flow direction is from east to west, it is unlikely that there would be any significant impact in the neighbouring wells arising from the Proposed Development. Given that the bedrock is of low permeability and the fact that

groundwater and surface water run-off will be managed by infiltration at the Site apart from unexpected flooding / rainfall events when the excess water will be re-directed to the water management ponds, it is determined that the potential groundwater into the quarry due to blasting will have an imperceptible effect.

8.4.2 Surface Water

Surface water quality measurements were taken as discussed in Section 8.3.4.3 above at the Site and show that the surface water quality results were compliant with the surface water regulatory limits. The plan for water management at the Proposed Development primarily utilises a component of groundwater evaporation and water management ponds to address the on-site water. As noted in Section 3.2, measures to prevent overflowing within these ponds involve the pumping of water to a land drainage system that discharges to an off-site pond. However, as seen in Figure 8-8 above, this pond is not categorised and/or recognised as a surface waterbody under the WFD by the EPA; hence, it has no associated quality or risk status assigned. Additionally, there is no identified direct connection between this off-site pond and nearby surface waterbodies identified under the WFD, such as the CARRIGOWER_020 waterbody. However, evidence suggests that there is an indirect connection through groundwater flow. Therefore, it is considered that any potential output of suspended solids will not interact with WFD surface waters.

Additionally, heavy machinery will be required in order to carry out the works at the Proposed Development as in any quarry. As such, fuels and hydrocarbon oils utilised by the machinery during these operations may pose a significant hazard to surface water via the indirect groundwater connection in the event of a spill or accidental release. However, an incident response procedure will be in place to swiftly contain and mitigate such incidents. Further mitigation measures will be implemented to limit the magnitude of any impacts should such a spill or release occur.

8.5 Proposed Mitigation Measures

During preparatory and operational works at the Proposed Development, the usage of fuel-powered equipment and machinery will be required. In order to limit the risk of contamination from these materials, mitigation measures will be in accordance with the EPA (2006) Environmental Management Guidelines: Environmental Management in the Extractive Industry (Non-Scheduled Minerals), whereby:

- Items of plant and machinery will be refuelled by a mobile fuel bowser by a competent person utilising adequately sized and positioned drip trays;
- Absorbent sands and a full spill kit system will be adjacent to all refuelling operations;
- The wheel wash will be serviced and maintained, including the removal of sediment off-site periodically by a permitted contractor to a licensed facility, to prevent the release of finer sediment, fuels and greases that accumulate over time;
- Unauthorised access is prevented in so far as possible; and,
- Any hazardous waste, such as waste oils, generated on-site will be collected in leak-proof containers and stored on-site in designated areas to be collected and recycled / disposed of by an authorised waste contractor in accordance with the relevant waste regulations.

In addition, the following measures will be implemented to prevent contamination release:

- Silt fencing will be installed where required to prevent the erosion of berms;
- Preventative maintenance and relevant maintenance logs will be kept for all on-site plant and equipment, including the generator associated with the water management system pump;

- Procedures and contingency plans will be set up to deal with emergency accidents or spills;
- Lubricants and hydraulic fluids for screening equipment used on the Site will be carefully handled to avoid spillage, properly secured against unauthorized access or vandalism, and provided will spill containment according to best practice codes;
- Any spillage of fuel, lubricants or hydraulic oils will be immediately contained, and the contaminated soil removed from the Site and appropriately disposed of;
- Any pumping from the water management ponds into the land drainage system leading to the overflow pond will be restricted to agricultural rates;
- The generator for the pumping system will be appropriately bunded to limit a potential leak of fuel or lubricant into the water management ponds;
- The water management ponds will be inspected weekly and quarterly to screen for the presence of hydrocarbons in the tanks:
    - If hydrocarbon contamination is detected, any pumping of water to discharge from the ponds will cease. The installed pump will be inspected and will be cleaned / undergo maintenance to remove any residual hydrocarbons before it is returned to use; and,
    - As soon as feasible, any contaminated water will be removed from the ponds using a separate pump and stored on-site in secure containers for collection by an appropriately qualified waste contractor.
- The water management ponds will be inspected visually prior to pumping.

8.6 Cumulative and In-combination Impact

There are a number of quarry sites within the vicinity of the Proposed Development (See Section 5.3.3.3), four of which (QY26, QY15/16, Stephenson Sand and Gravel Pit and O'Halloran Pit) are located approximately downflow of the inferred groundwater flow. All of these quarries are no longer operational, with Q15/16 having undergone restoration as a soil recovery facility. Stephenson Sand and Gravel Pit and O'Halloran Pit are currently undergoing restoration as soil recovery facilities via inert material importation, whilst Q26 has previously been used as an illegal landfill and is currently undergoing remediation and restoration.

Given that these sites are no longer operating quarries and are restored/being restored, cumulative impacts relating to quarry operation are predicted to be imperceptible. Furthermore, although contamination leaching from the illegal landfill located downflow of the Site would be a concern for local groundwater quality, the associated quarry is currently undergoing remediation to limit / reduce any impacts on groundwater quality and as such, it is unlikely a greater in-combination impact will as a result of the Proposed Development and landfill site interacting.

It is not considered that the Proposed Development will have any significant impacts on hydrology provided that the above mitigation measures are implemented.

It is, therefore, unlikely that the Proposed Development will have any significant cumulative or in-combination effects.

8.7 Interactions with other Environmental Attributes

Water (Hydrogeology and Hydrology) interacts with other environmental attributes as follows:

- Chapter 5 (Population and Human Health) - Potential impacts on human health due to groundwater contamination are unlikely to occur following implementation of mitigation;

- Chapter 6 (Biodiversity) - Potential impacts on hydrology can also impact on ecological conditions and ecologically designated sites. The impacts on biodiversity are addressed in Chapter 6; and,
- Chapter 7 (Land Use, Soils and Geology) - Impact on soils/bedrock can result in related impacts on surface water and groundwater. These impacts on the bedrock are discussed in Chapter 7.

8.8 Indirect Effects

No indirect effects are predicted as part of the Proposed Development.

8.9 Residual Effects

Following the full implementation of the mitigation measures, the risk of hydrocarbon spillage will be reduced to a low probability event, and the response to spillage should be sufficient to limit the magnitude of a spillage event to a slight negative impact for both surface and groundwater receptors.

Following mitigation, the impacts on local groundwater from dissolved materials (i.e. suspended solids) are negative but imperceptible to the Ballyglass GWB. No direct connections to the CARRIGOWER_020 waterbody, and downstream waterbodies, was identified and it is considered that no interactions are to occur.

As such, the Proposed Development will not cause a deterioration in the status of all surface and groundwater bodies assessed. The Proposed Development will not obstruct surface water bodies from achieving “Good” chemical or ecological quality status, nor prevent the SLANEY_040 waterbody from achieving its specific “High” status objective. The Proposed Development will not obstruct groundwater bodies from achieving “Good” chemical or quantitative quality status. Therefore, the Proposed Development will not compromise the objectives and requirements of the WFD within the local area and within the river basin district.

8.10 Monitoring

It is proposed to undertake monthly monitoring of the groundwater levels (dips) on-site, during the Operational Phase of the Proposed Development at all wells (BH01 to BH07). Quarterly groundwater quality will be undertaken for the Site at the same wells; however, as the excavation takes place, BH06 and BH07 will no longer be part of the monitoring schedule.

In addition to direct groundwater monitoring, weekly inspections of the water management ponds (i.e. the integrity of the walls and water level) and visual inspections prior to pumping will be undertaken to check for the presence of suspended solids and hydrocarbons. Quarterly water quality monitoring will also be undertaken so that the ponds can screen for potential contamination.

8.11 Reinstatement

The restoration phase of the Proposed Development will provide a mosaic of habitats, including woodland areas, boundary vegetation, retained and re-planted treelines, ponds, bare ground scrapes / unvegetated quarry benches and areas of recolonising bare ground.

8.12 Difficulties Encountered

There were no difficulties encountered.

9 AIR QUALITY

9.1 Introduction

This chapter of the EIAR provides a description and assessment of the likely effects of the Proposed Development on air quality in the vicinity of the Site.

9.2 Methodology

The following standards and guidance documents were used to assess the baseline conditions and in the assessment of potential impacts:

- Department of Environment Heritage and Local Government ('DEHLG') - Quarries and Ancillary Activities: Guidelines for Planning Authorities, 2004;
- Institute of Air Quality Management ('IAQM')- Guidance on the Assessment of Mineral Dust Impacts for Planning, 2016;
- EPA Environmental Management in the Extractive Industry (Non-Scheduled Minerals), 2006 ;
- Irish Concrete Federation ('ICF') Environmental Code, 2005 ;
- EPA - Air Quality in Ireland 2021 - Indicators of Air Quality;
- EPA - Air Quality in Ireland 2022 – Indicators of Air Quality;
- Federal Government of Germany Technical Instructions on Air Quality Control ('TA Luft'), (2002);
- EPA – Air Dispersion Modelling from Industrial Installations Guidance (AG4) (2019); and,
- Transport Infrastructure of Ireland – Air Quality Assessment for specified Infrastructure Projects – overarching technical document (2022).

Given the nature of activities associated with the Proposed Development, the IAQM Guidance on the *Assessment of Mineral Dust for Planning* for completing a disamenity dust risk assessment was used, see Appendix 9-1 for further information.

The main potential impacts on air quality from the Proposed Development are from airborne particulate matter (PM_{10}) and nuisance dust deposition. The potential impacts caused by the release of NO_2 from plant and HGV movements were screened out of this assessment. This is based on the guidance relating to these emissions from the IAQM and the Transport Infrastructure of Ireland . Section 9.4.2 below provides further details on this screening for NO_2.

9.2.1 Policy Context

9.2.1.1 National Clean Air Strategy

The Department of Environment, Climate Action and Communications ('DCCAE') has prepared a Clean Air Strategy for Ireland, which was published in 2023 . The aim of the report outlines efforts to reduce certain specific sources of emissions that are having the greatest impacts whilst also identifying cost-effective approaches to reduce these emissions .

The Clean Air Strategy outlines key strategic priorities relating to air quality in Ireland, including:

- Ensure continuous improvements in air quality across the country;
- Ensure the integration of clean air considerations into policy development across Government;

- Enhance regulation and enforcement; and,
- Promote and increase awareness of the importance of clean air.

Emissions of PM_{10} in Ireland accounted to ca. 28.28kt in 2020, with the main source coming from agricultural emissions . Combustion from residential, commercial and institutional sectors accounted for 25.4% of the 2020 total .

9.2.1.2 Wicklow County Development Plan 2022-2028

The CDP details various aims and objectives relating to Air Quality relative to the Proposed Development [5].

Air Quality:

> **"RPO 7.7:** *To reduce harmful emissions and achieve and maintain good air quality for all urban and rural areas in the Region and to work with Local authorities and the relevant agencies to support local data collection in the development of air quality monitoring and to inform a regional air quality and greenhouse gas emissions inventory.*
>
> **CP015.9:** *To regulate and control activities likely to give rise to emissions to air (other than those activities which are regulated by the EPA).*
>
> **CP015.10:** *To require proposals for new developments with the potential for the accidental release of chemicals or dust generation, to submit and have approved by the Local Authority construction and/or operation management plans to control such emissions.*
>
> **CP015.11:** *To require activities likely to give rise to air emissions to implement measures to control such emissions, to undertake air quality monitoring and to provide an annual air quality audit."*

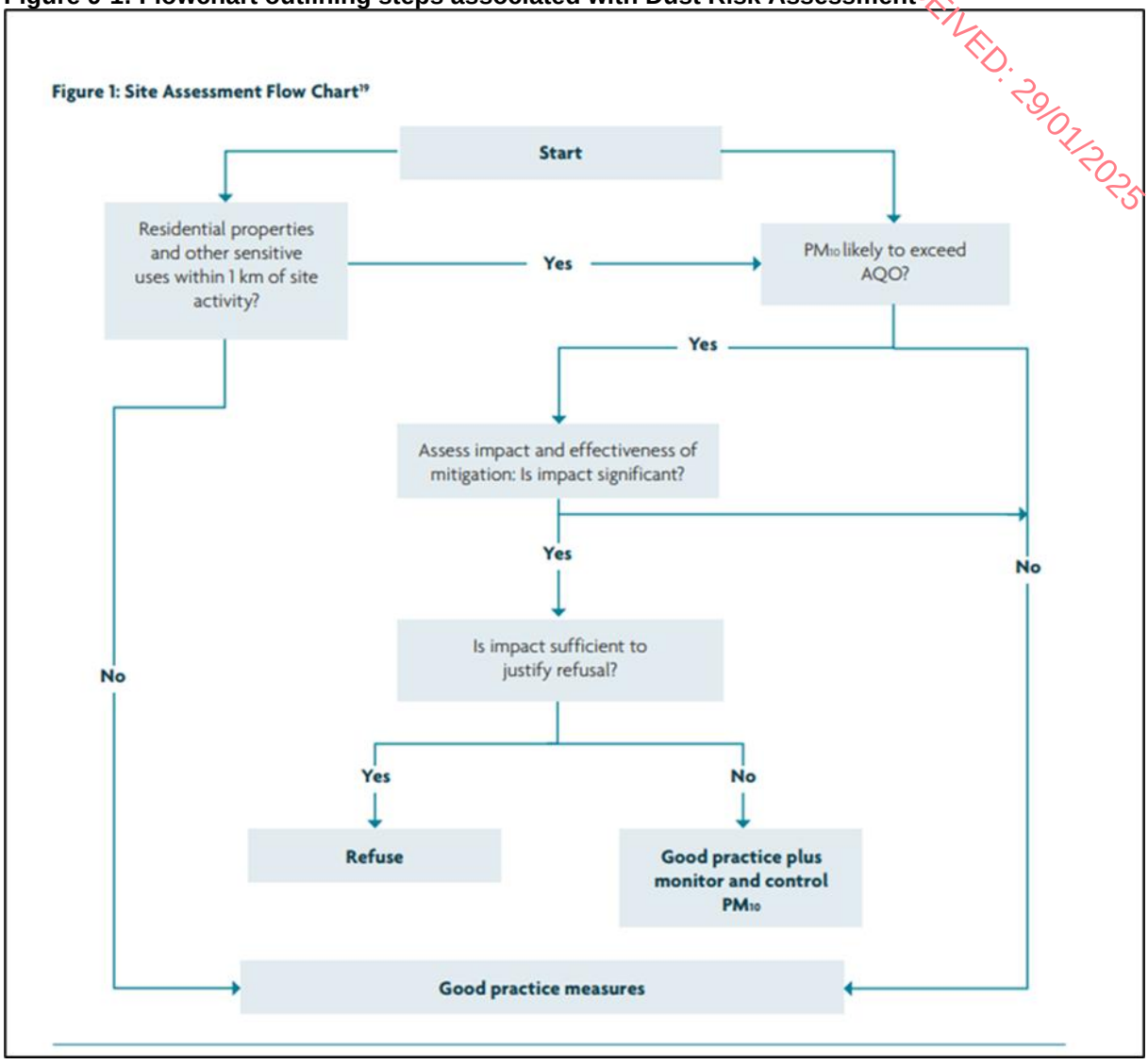
9.2.2 Mineral Dust Risk Assessment

A risk assessment of dust emissions arising from activities associated with the Proposed Development was completed in accordance with IAQM guidelines . A flow chart outlining the various steps associated with the preparation of a dust risk assessment are outlined in Figure 9-1 below, with full details presented in Appendix 9-1.

The definition of minerals in this chapter is taken from Statutory Instruments ('S.I') No. 600 of the Planning and Development Regulations (as amended).

The minerals discussed in this chapter / risk assessment are 'non-scheduled' associated with the extraction of rock / stone aggregates.

Figure 9-1: Flowchart outlining steps associated with Dust Risk Assessment



9.3 Receiving Environment

9.3.1 Air Quality Standards

Assessment of the significance of emissions to air is made with reference to limit values established in the latest EU legislation, the Clean Air for Europe (I) Directive (2008/50/EC) which was transposed into Irish law in 2011 (S.I. No. 180 of 2011).

The Air Quality Standards ('AQS') set out in the Air Quality Directive (2008/50/EC) and S.I. No. 180 of 2011 are shown in Table 9-1 below. The AQS are based on the effects of pollutants on human health, although other factors such as effects on vegetation and ecosystems are sometimes considered.

Table 9-1: EU and Irish Air Quality Standards ('AQS') Limit Values

Pollutant	Objective			
	Concentration (µg/m^3)	Maximum No. of Exceedances Permitted per annum	Exceedance as a %	Measured As
Particulate Matter (PM_{10})	50	35 times in a year	90.4th percentile	24-hour mean
	40	None	-	Annual mean

The above AQS limit values are applicable to the air quality in the locality of the Proposed Development. It should be noted that suspended dust associated with quarries will be coarse in the sub-fraction $PM_{2.5}$ -PM_{10} rather than in the fine fraction $PM_{2.5}$. As such, $PM_{2.5}$ has not been considered further in this assessment.

9.3.2 Dust Deposition Limits

According to the EPA's Guidelines for Extractive Industries and the DEHLG, Quarries and Ancillary Activities, quarries, by their nature, generate dust, with the main effects being disamenity/nuisance due to dust deposition. There are currently no Irish statutory limits relating specifically to dust deposition thresholds for inert dust. However, for quarries, government [12], EPA and industry guidance specify the Bergerhoff Method. The Bergerhoff Method specified in the German TA Luft Air Quality Standards is designed for monitoring of dust deposition. The TA Luft dust deposition limit value of 350mg/m^2/day, averaged over a 30-day period is typically set as a limit along all landholding boundaries associated with quarry developments.

9.3.3 Background Air Quality

EU legislation on air quality requires that all Member States divide their territory into zones for the assessment and management of air quality. The current trends in air quality in Ireland are reported in the EPA publication Air Quality in Ireland– Annual Report 2022 which is the most up to date report on air quality in Ireland.

For ambient air quality management and monitoring in Ireland, four zones, A, B, C and D are defined in the AQS Regulations (S.I. No. 180 of 2011) and are defined as follows:

- Zone A: Dublin Conurbation;
- Zone B: Cork Conurbation;
- Zone C: 24 cities and large towns. Includes Galway, Limerick, Waterford, Clonmel, Kilkenny, Sligo, Drogheda, Wexford, Athlone, Ennis, Bray, Naas, Carlow, Tralee, Dundalk, Navan, Newbridge, Mullingar, Letterkenny, Celbridge and Balbriggan, Portlaoise, Greystones and Leixlip; and,
- Zone D: Rural Ireland, i.e. the remainder of the State excluding Zones A, B & C.

According to the above classification, the Site is in Zone D. Table 9-2 below shows the baseline air quality data monitored by the EPA stations across towns located in Zone D.

Table 9-2: Annual Mean Concentrations of Pollutants Measured in Zone D

Monitoring Stations	Total Particulates PM_{10} Annual Mean (µg/m³)	
	2021	2022
Castlebar	9.8	11.2
Cobh	12	13.2
Claremorris	9.5	7.9
Kilkitt	7.8	8.5
Roscommon Town	10.3	11.2
Enniscorthy	13.7	15.0
Macroom	14.6	16.1
Tipperary Town	12.7	13.9
Carrick-on-Shannon	9.4	9.4
Birr	12.2	14.5
Askeaton	8.7	-
Cavan	10.6	11.0
Edenderry	17.8	17.7
Mallow	14.8	13.5
Longford	13.9	16.0
Cobh Cork Harbour	13.4	14.4
Average Zone D	**11.9**	**12.7**
Average Zone D (2021-2022)	**12.3**	

The maximum concentration recorded in Zone D for PM_{10} was recorded at the Edenderry Station in 2021 (17.8µg/m^3). Annual concentrations recorded at Zone D from 2021 to 2022 range between 7.8 and 17.8µg/m^3.

The closest long-term Zone D EPA station to the Site, which monitors PM_{10}, is Enniscorthy (Station 24), ca. 55km to the southeast. Concentrations at the station range between 13.7µg/m^3 and 15µg/m^3 between 2021-2022. When determining the background concentrations, two consecutive years across all Zone D monitoring locations were used. The average Zone D background concentration of the long-term monitoring campaign (12.3µg/m^3) will be used as a conservative estimation of background PM_{10} emissions. Further details of the determination of background PM_{10} concentrations relative to the Proposed Development are detailed in Section 9.5.1 below.

9.3.4 Other Sources of Emissions to Air in the Vicinity of the Site

Notable sources of potential emissions to air within the vicinity of the Site include:

- Existing traffic associated with local roads;
- Agricultural activities; and,
- Residential dwellings (potential solid fuel combustion).

These sources of potential air emissions are typical for a Site located in Zone D. The closest Industrial Emission ('IE') licenced facilities located <10km from the Proposed Development are outlined in Table 9-3 below.

Table 9-3: The nearest IEL and Intergovernmental Panel on Climate Change (IPCC') operations associated with the Proposed Development.

Licence Number	Name of Organisation	Activities Associated	Distance and orientation to Proposed Development
P0041	Dublin Products Limited	The disposal or recycling of animal carcasses and animal waste with a treatment capacity exceeding 10 tonnes per day	ca. 7.8km Northwest
W0066	Rampere Landfill	Land treatment, including biodegradation of liquid or sludge discards in soils: Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons; Specially engineered landfill, including placement into lined discrete cells which are capped and isolated from one another and the environment; Recycling or reclamation of other inorganic materials: Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced:	ca. 6.9km Southwest
W0204	Brownfield Restoration Ireland Ltd.	Disposal of non-hazardous waste with capacity exceeding 50 tonnes per day involving one or more of the following activities: Physio-chemical treatment; Recovery or a mix of recovery and disposal of non-hazardous waste with capacity exceeding 75 tonnes per day.	ca. 1.9km Northwest

As per the IAQM Guidance on Mineral Dust, the conceivable impacts caused by quarry operations on PM_{10} or nuisance dust can be observed up to 400m from a limestone quarry . Taking this 400m distance as the outer limit for potential quarry-related effects on air quality, it's pertinent to note there are no licenced facilities within this radius of the Proposed Development. Consequently, the likelihood of cumulative effects on local air quality, impacting sensitive receptors due to licenced facilities, is not likely and not significant.

9.3.5 Baseline Bergerhoff Dust Monitoring

Between the 29th June 2023 to the 5th October 2023. Bergerhoff monitoring was conducted at four locations to determine to establish baseline conditions around the Site (see Figure 9-2 below). The location of the Bergerhoff jars were determined by experienced MOR Environmental monitoring personnel with the contents of the jars analysed by an accredited laboratory.

The results of the Bergerhoff dust monitoring are presented in Table 9-4 below.

Table 9-4: Bergerhoff Dust Monitoring Results for 2023

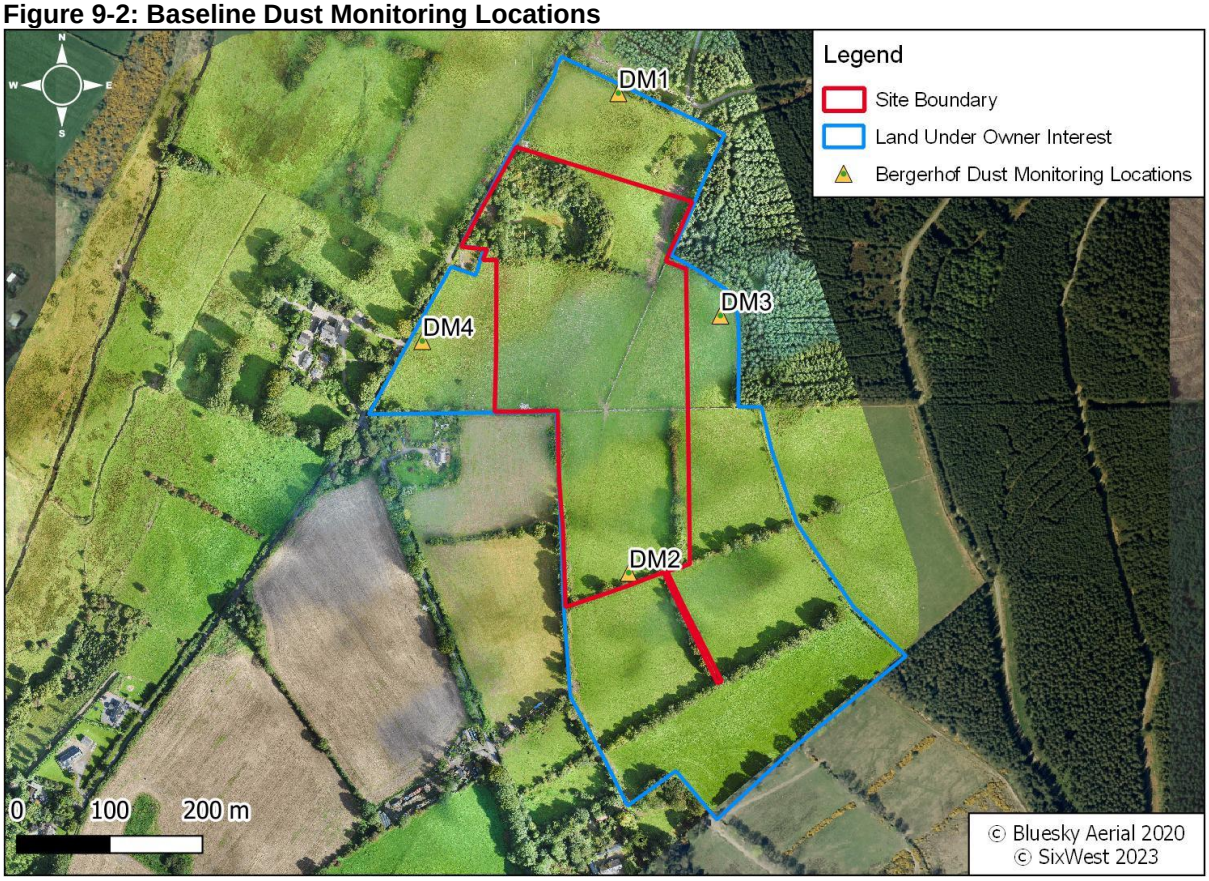
Monitoring Locations	Monitoring Event 1 29/06/2023- 26/07/2023	Monitoring Event 2 26/07/2023- 24/08/2023	Monitoring Event 3 07/09/2023- 05/10/2023	TA Luft Limit mg/m²/day
DM1	-	261*	3	350
DM2	-	-**	-**	350
DM3	23	-**	-**	350
DM4	142	81	-**	350

- Monitoring Location not used during monitoring event.

*Sample jar at location showed major discolouration and turbidity due to organic matter.

**Sample jar at location was damaged from livestock and could therefore not be analysed.

Figure 9-2: Baseline Dust Monitoring Locations



Across the three-baseline monitoring period, the annual mean values recorded were below the TA Luft limit value of 350mg/m^2/day. No individual elevated concentrations of dust results were recorded. Monitoring Event 2 and 3 dust results were affected by livestock which tampered with the Bergerhoff monitoring jar and therefore could not be analysed.

9.3.6 Dust Sensitive Receptors

The Proposed Development will involve activities associated with mineral extraction, such as:

- Site preparation / restoration (working soil and overburden);

- Materials handling;
- On-site transportation; and,
- Off-site truck movements (potential track out).

A risk assessment was completed in accordance with the IAQM's Guidance on The Assessment of Mineral Dust Impacts for Planning .

As identified above, adverse impacts from rock quarries *"are uncommon beyond"* 400m measured from the nearest dust-generating activities. As such, occupied receptors which occur within 400m or less from the Site boundary have been considered in this dust risk assessment.

The greatest potential for high rates of dust deposition and elevated PM_{10} concentrations occurs within 100m of dust-generating activities [12].

Dust-generating activities in this instance will primarily arise from the quarry void where the extractive activities will occur (unless otherwise specified). Six human receptors and one ecological receptor were identified within 400m of dust-generating activities associated with the Proposed Development (SR01-SR06) (Table 9-5 below).

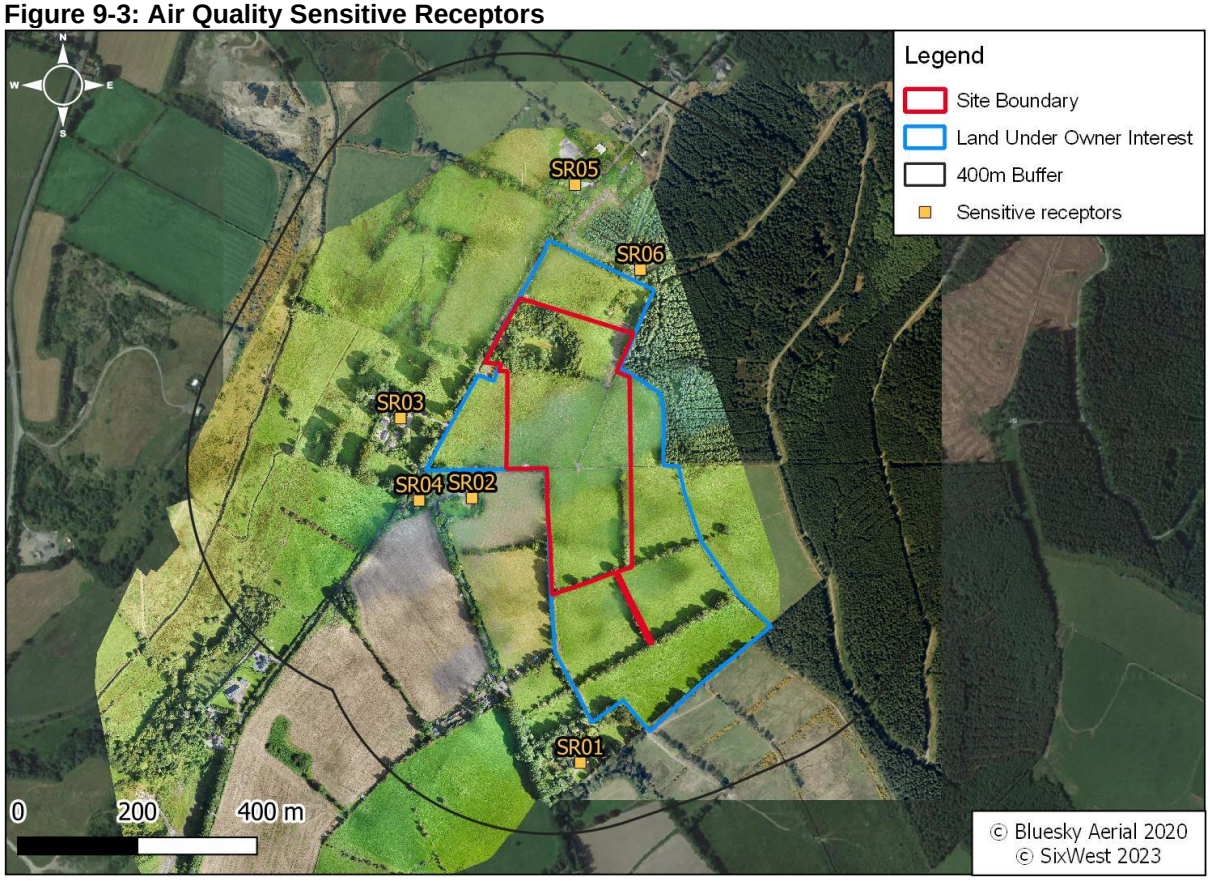
The Proposed Development includes a wheel wash with hardstanding areas which HGVs will use when leaving the Site entrance.

Table 9-5: Identification of Human Sensitive Receptors ('SRs')

ID	ITM (Easting, Northings)		Description of Sensitive Receptor	Distance/ Ordination from Emission Source (m)	Terrain between Site and Receptor
	E	N			
SR01	691952	694867	Proxy for residential dwellings to the south of the Proposed Development	ca. 285m	Terrain between the receptor and dust-generating activities includes agricultural fields. Potential buffers within this terrain are hedgerows around the periphery of the Site and hedgerows forming field boundaries.
SR02	691781	695306	Residential dwelling to the west	ca. 78m	Terrain between the receptor and dust-generating activities includes an agricultural field. Potential buffers within this terrain are hedgerows around the periphery of the Site and hedgerows forming field boundaries.
SR03	691654	695331	Residential dwellings to the west of the Proposed Development	ca. 170m	Terrain between the receptor and dust-generating activities includes tress associated with hedgerows and the Donard Mountain Road.
SR04	691685	695304	Residential Property to the southwest	ca. 159m	Terrain between the receptor and dust-generating activities includes a road, mature trees and hedgerows.
SR05	691948	695828	Proxy for Residential Property to the North	ca. 201m	Terrain between the receptor and dust-generating activities includes an agricultural field, road and woodland associated with Deerpark Forest.
SR06	692056	695689	Public walkway	ca. 135m	Terrain between the receptor and dust-generating activities includes an agricultural

ID	ITM (Easting, Northings)		Description of Sensitive Receptor	Distance/ Ordination from Emission Source (m)	Terrain between Site and Receptor
	E	N			
					field and trees associated with Deerpark Forest.

Figure 9-3: Air Quality Sensitive Receptors



9.3.7 Designated Ecological Receptors

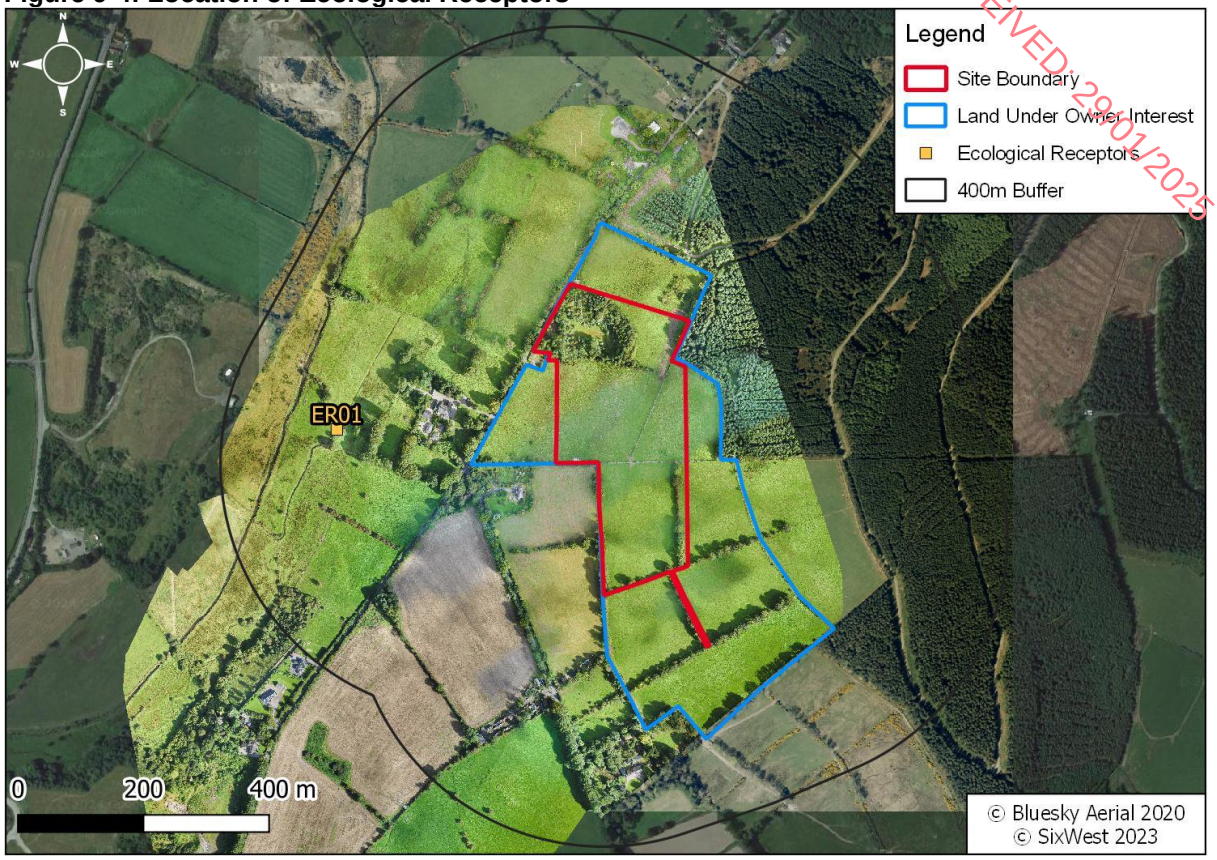
The closest ecological European Protected Designated Sites (Natura 2000) (Slaney River Valley SAC) is located 328m to the Proposed Development. Table 9-6 displays the location of nearby ecological receptors.

Table 9-6: Location of Natura 2000 sites

ID	Site Name	Site Code	Distance (km) & Direction
ER01	Slaney River Valley SAC	000781	328m West

Following the IAQM Guidelines on assessing the effects of mineral dust on ecological receptors, any potential sensitive area will be included within a 400m radius of the Proposed Development. Refer to Chapter 6 (Biodiversity) for further information on these sites. Figure 9-4 below shows the ecological receptors relative to the Proposed Development.

Figure 9-4: Location of Ecological Receptors



9.3.8 The Impact of Weather Conditions on Dust Emissions

Weather conditions can have a significant effect on the dispersion of ambient dust, thus influencing the impacts on nearby sensitive receptors. Higher levels of dust deposition typically occur during dry spells associated with medium to strong breezes (>5.5m/s) or force 4, moderate breeze to force 6, strong breeze, on the Beauford Scale.

A wind rose was completed to determine the potential influence of wind direction on airborne dust particles. The closest Met Eireann weather station which records hourly data is at Oak Park, Co. Carlow. Oak Park is located ca. 24km to the south of the Site.

A wind rose utilising five years of data (2019-2023) has indicated that the prevailing wind blows primarily from a southerly direction (Refer to Figure 9-5 below).

Figure 9-5: Wind Rose utilising data from Oak Park, Co. Carlow 2019-2023

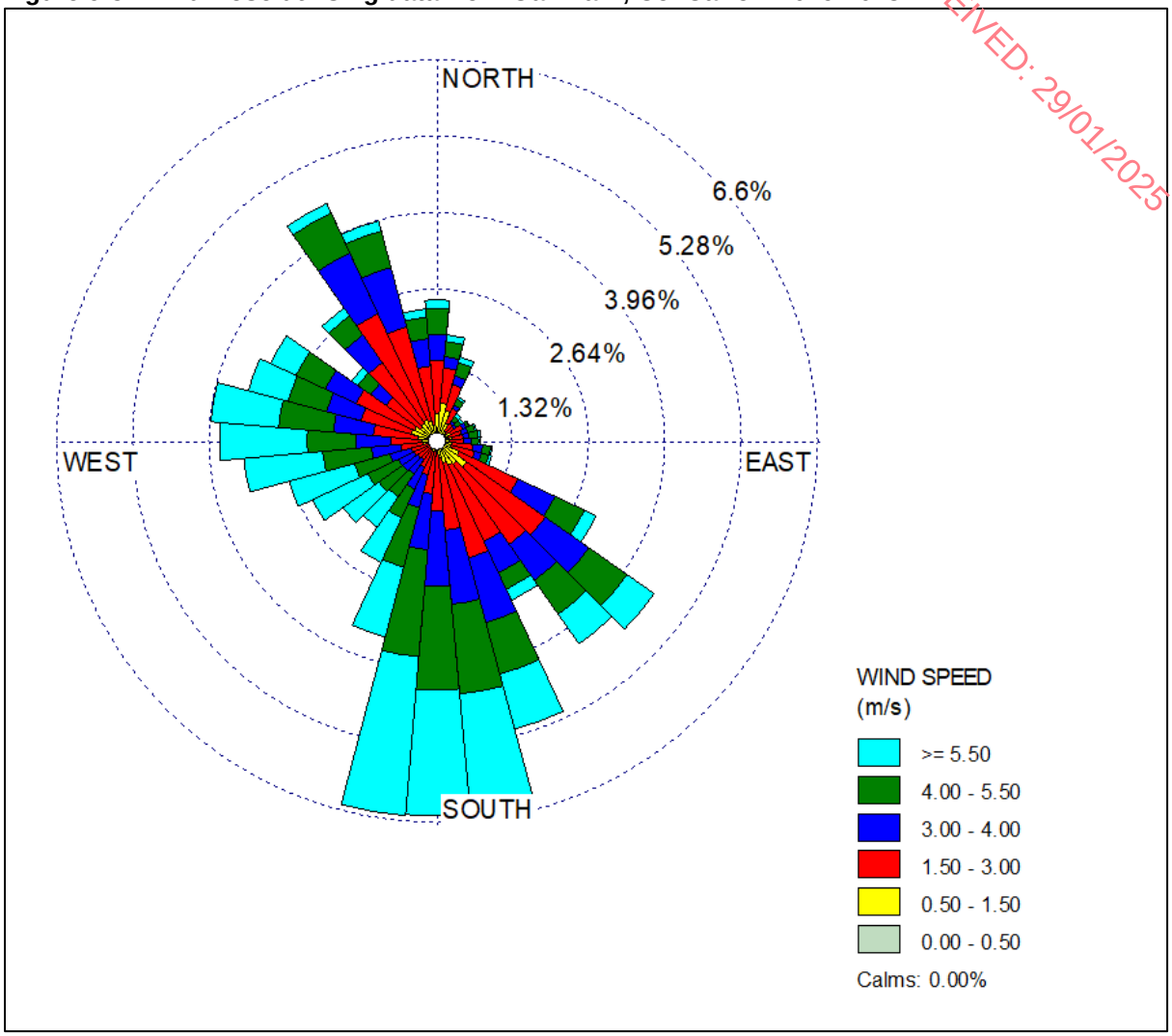


Table 9-7 below summarises the important meteorological variables recorded at the Oak Park station between 2019-2023.

Table 9-7: Summary of Meteorological Data at Oak Park, Co. Carlow 2019-2023

Year	Total Precipitation (mm)	Average Windspeed (m/s)
2019	865.4	7.5
2020	910.1	8.1
2021	784.8	7.0
2022	840.1	7.3
2023	936.9	7.5
Average 2019-2023	**867.5**	**7.5**

The average windspeed data at the Oak Park station between 2019-2023 was 7.5m/s. The prevailing wind direction was from the south (S). This would indicate that receptors in the opposite of these directions would be most sensitive to fugitive dust emissions.

9.4 Characteristics and Potential Effects of the Proposed Development

The main potential effects on air quality from rock quarries are dust emissions, which can have the following impacts:

- Disamenity due to dust deposited on surfaces; and,
- Increased concentrations of dust particles suspended in the air (PM_{10}), which may pose a threat to human and ecological health.

Assessment of disamenity dust and suspended dust particles (PM_{10}) is detailed below. Regarding disamenity dust, three phases of the Proposed Development were considered:

- Construction Phase;
- The Operational Phase; and,
- Rehabilitation Phase.

9.4.1 Construction Phase - Site Preparation / Overburden Stripping

As discussed in Section 3.3.1 above, the Construction Phase will relate to the preparation of the old quarry for aggregate processing activities. Construction of ancillary infrastructure and preparation works on the quarry area adjacent to the local road will be improved to provide for a modern site entrance. Prior to moving into the existing agricultural fields for aggregate processing activities, topsoil and overburden will be removed, and used for the creation of embankments will also occur. Exposed rock outcropping will occur.

9.4.2 Operational Phase - Aggregate Extraction and Processing

As discussed in Section 3.3.2 above, the main activities related to the operational phase Proposed Development is as follows:

- Drilling and blasting of the rock face;
- The crushing and screening of aggregate by size / weight, including the placement of aggregate within stockpiles; and,
- The haulage of aggregate from the Site.

The following equipment will be used during the Operational Phase of the Proposed Development:

- Primary Crusher / Screener;
- Three Wheel Loaders; and
- Excavator.

The movement of HGVs and the operation of on-site plant have the potential to cause effects on local air quality through the release of NO_2 to the atmosphere. Potential traffic emissions were screened out in accordance with the thresholds set out by the Transport Infrastructure of Ireland, Technical Guidance on Air Quality Assessments . According to the guidance, a detailed assessment is required when:

- Heavy goods vehicles ('HGV') (vehicles greater than 3.5 tonnes, including buses and coaches) flows will change by 200 AADT[3] or more.

The anticipated HGV movements associated with the Proposed Development is 84 HGV movements (42 inward and 42 outward trips a day).

[3] Annual Average Daily Traffic ('AADT') is defined as the total two-way traffic volume passing a point or segment of a road for one calendar year, divided by the number of days in a year (365)

According to the IAQM Guidance on Demolition and Construction, exhaust emissions from on-site plant and on-site traffic are unlikely to make a significant impact on local air quality.

Therefore, assessing the potential effects on air quality as a result of plant and traffic both on-site and off-site has also been screened out. Due to very occasional use and the small size of the on-site generator, emissions to air from this generator also has been screened out.

As the restoration phase will include minor works such as the removal of plants and equipment from the Site, no additional sources of dust are considered.

9.4.3 Rehabilitation Phase - Site Closure

The rehabilitation phase will be done following the cessation of the quarry activities in line with a Restoration Plan, which is submitted with this planning application. The rehabilitation will take into account the restoration plan for the existing quarry, the species that will likely utilise the area following completion of the works and also measures to enhance the quarry for these species.

The potential for dust emissions will be similar to that outlined for the construction phase.

9.4.4 Mineral Dust Risk Assessment

9.4.4.1 Suspended Dust

The IAQM Guidance on Mineral Dust states that ;

> *"if the long-term background PM_{10} concentration is less than 17µg/m^3, there is little risk that the Process Contribution (PC) would lead to an exceedance of the annual mean objective……. 17µg/m^3 is considered to be a suitable screening value for an assessment of annual mean PM_{10} concentrations".*

This figure is based on the estimated maximum annual process contribution of 15µg/m^3 for mineral extraction activities.

When determining the background concentrations of PM_{10} at the Proposed Development, it the 2-year (2021-2022) average for Zone D (12.3µg/m^3) was identified as the most appropriate data to be used as background concentrations (Section 9.3.3 above).

Table 9-8 below details the Predicted Environmental Concentrations ('PEC') of ambient PM_{10}.

Table 9-8: Predicted Environmental Concentrations ('PEC') of ambient PM_{10}

Parameters	PM_{10} Concentrations (µg/m^3)
Maximum Process Contribution*	15µg/m^3
Background Concentrations**	12.3µg/m^3
Predicted Environmental Concentration ('PEC')	27.3µg/m^3
Annual Mean Objective*	32µg/m^3
Annual AQS Limit for PM_{10}	40µg/m^3

**determined from the IAQM Guidance. ** determined from the average recorded on-site at the Proposed Development*

The PEC is 27.3µg/m^3, which is below the annual mean objective of 32µg/m^3 According to the IAQM Guidance , if the predicted environmental concentration of PM_{10} is less than 32µg/m^3, there is little risk of the annual AQS limit being exceeded and no further consideration of the risk posed by ambient PM_{10} concentrations is warranted.

9.4.4.2 Disamenity Dust Risk Assessment

As per the IAQM Guidelines, the assessment of disamenity dust follows the Source-Pathway-Receptor Concept, whereby a combination of the Residual Source Emission (Source), frequency of windspeeds (Pathway) and the distance of the receptors to the source (Receptor) determines the likely effects of disamenity dust. Residual Source Emissions were determined for all activities associated with the Proposed Development and will be discussed as cumulative sources of dust emissions.

Table 9-9 below shows the estimation of the magnitude of Residual Source emissions.

The magnitude of Residual Source Emissions was determined based on the scale of the anticipated operations at any one time and was classified between small and large, taking into account the design in mitigation; see Section 9.6 below. The assessment in Table 9-9 was completed in accordance with the IAQM Guidelines on Mineral Dust for Planning, see Appendix 9-1 .

Table 9-9: Classification of the Residual Source of Emissions

Activity	Activity Details (all values are approximate)	Magnitude of Residual Source of Emissions
Site Preparation	• Site area is ca. 8.1ha; • Up to four heavy plant will be active on-site; • Berms and embankments will be created around the boundary of the Site ca. 3m in height and 11m wide; • Site preparation will mainly involve the clearing of vegetation and reduce the floor level and preparing the face for blasting; and, • Removal of overburden.	**Medium**
Mineral Extraction	• Total working area ca. 5.01ha; • Blasting will occur up to 12 times per annum; • Coarse material of larger particle size; and, • 200,000 tonnes of material will be extracted per annum.	**Medium**
Material Handling	• Up to five heavy plants will be in operation at once; • Main extraction area will be located ca. 150m from the nearest receptors to the west; • Rock will be low dust potential material with high moisture content due to ingress groundwater; and, • Hard rock unpaved ground will be used throughout the haul routes and quarry void; and material of low dust potential.	**Medium**
Mineral Processing	• Raw material is of low dust potential; • On-site crushing and screening with conveyors will be carried out within the quarry void; and, • Up to 200,000 tonnes per annum ('tpa') will be processed.	**Medium**

Activity	Activity Details (all values are approximate)	Magnitude of Residual Source of Emissions
Stockpiles and exposed surfaces	• Stockpiles will be short-term- in nature; • Berms will be planted to reduce dust emissions and preserve soil quality; • Soil stockpiles will seeded to preserve soil quality and reduce dust emissions; and, • Materials will be constantly in flux with material removed and added throughout the Operational Phase.	**Medium**
On-site Transportation	• Wheel loaders will be used to transport materials; • Maximum transport speed will be 15km/hr on-site; and, • Hard rock unpaved haul routes will be used to transport materials from the quarry void.	**Small**
Off-site Transportation	• Up to 62 HGV trips (31 HGVs incoming and 31 HGVs outgoing) will be used per day for off-site transportation; • One wheel wash will be present on-site; and, • Site entrance access road to the wheel wash facilities will be paved with hardstanding.	**Medium**

The residual source of emission quantifies how much dust is expected to be generated by activities, including designed in mitigation measures. To determine the impact on sensitive receptors, it is important to consider how the dust will be transported, i.e. the Pathway Effectiveness . The site-specific factors considered to determine the Pathway Effectiveness of the dust emissions are the distance and direction of the receptors, relative to the prevailing wind directions.

For each receptor, wind frequency with speeds >5.5m/s from the direction of the dust source emissions was calculated for the five years of Met Éireann data for the Oak Park meteorological station (2019-2023). The >5.5m/s wind speed is characterised as a moderate breeze and is used as a general threshold for determining when wind dispersion is most likely to occur . According to the IAQM, high-risk meteorological conditions are when the wind is coming from the direction of the dust source at a sufficient strength, during periods of little or no rainfall (<0.2mm) or 'dry days'. As such, meteorological data used for the risk assessment was filtered to only represent dry days. The direction and frequency of these wind speeds are shown in Figure 9-6 below.

Criteria for wind speed ranging from infrequent to very frequent are detailed in Appendix 9-1. Table 9-10 below details the categorisation of wind related to each sensitive receptor along with the Pathway Effectiveness as per the IAQM Guidelines.

When determining the rating of the receptor distance from the dust source, close represents a receptor less than 100m from the source, an intermediate receptor represents a receptor between 100 to 200m from the dust source and a distant distance represents a receptor located between 200-400m from the dust source. Table 9-10 below details these sensitive receptors, and their classification based on the Pathway Effectiveness.

Figure 9-6: Windrose for Oak Park synoptic station 2019-2023

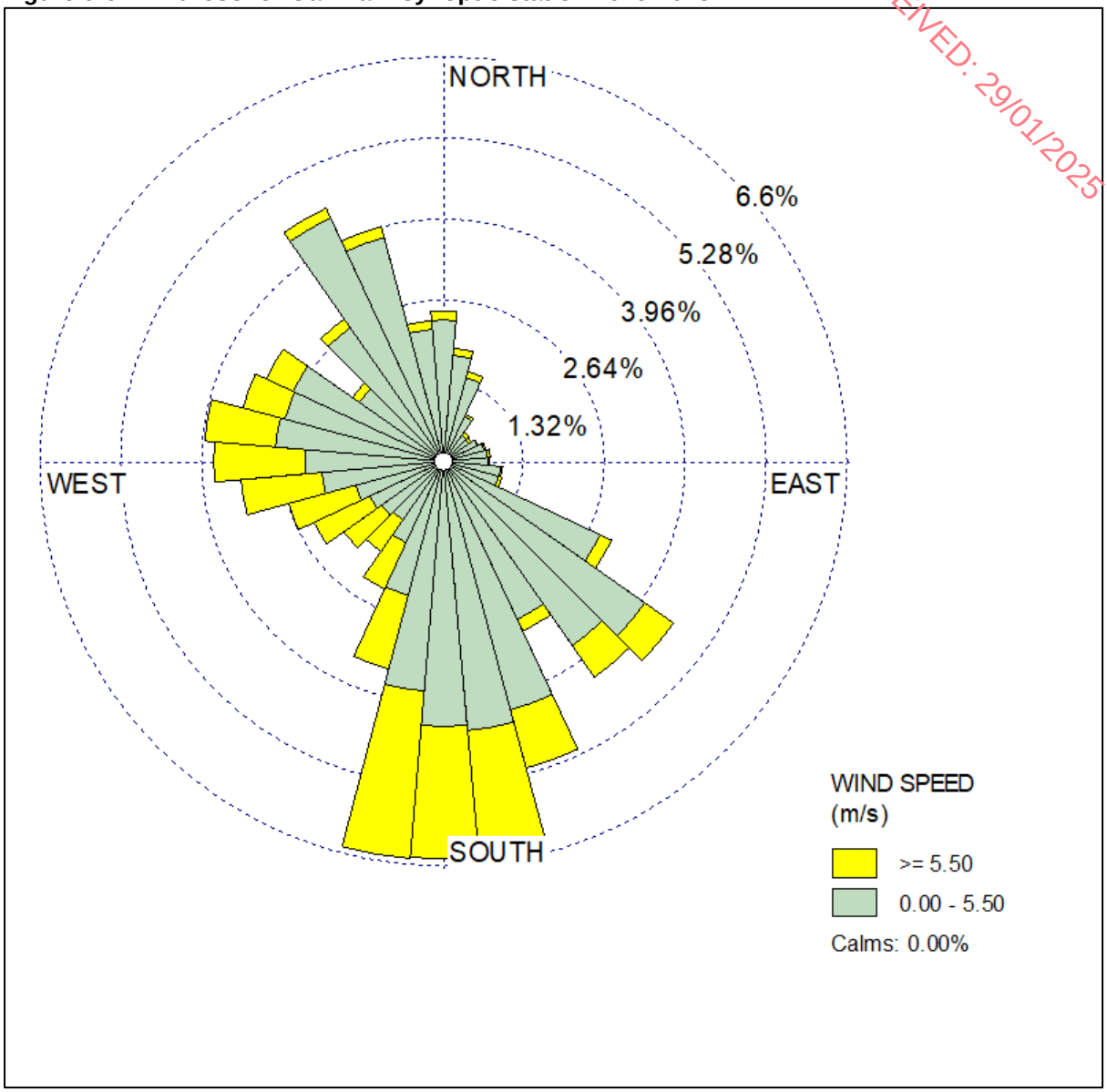


Table 9-10: Classification of the Pathway Effectiveness

ID (Receptor Sensitivity)	Distance from the Emission Source (Orientation to emission Source)	Frequency of wind from the direction of dust source (dry weather) (>5.0m/s)	Pathway Effectiveness
SR01 **(High)**	ca. 285m **(Distant)**	0.7% (307 hours) coming from the north (345 to 15 degrees) **Infrequent**	**Ineffective**
SR02 **(High)**	ca. 78m **(Close)**	0.4% (155 hours) coming from the northeast (35 to 85 degrees) **Infrequent**	**Ineffective**

ID (Receptor Sensitivity)	Distance from the Emission Source (Orientation to emission Source)	Frequency of wind from the direction of dust source (dry weather) (>5.0m/s)	Pathway Effectiveness
SR03 **(High)**	ca. 170m **(Intermediate)**	0.3% (120 hours) coming from the east (65 to 115 degrees) **Infrequent**	**Ineffective**
SR04 **(High)**	ca. 159m **(Intermediate)**	0.2% (109 hours) coming from the northeast (35 to 85 degrees) **Infrequent**	**Ineffective**
SR05 **(High)**	ca. 201m **(Distant)**	8.5% (3692 hours) coming from the south (165 to 195 degrees) **Moderately Frequent**	**Moderately Effective**
SR06 **(Medium)**	ca. 135m **(Intermediate)**	6.6% (2885 hours) coming from the southwest (185 to 225 degrees) **Moderately Frequent**	**Moderately Effective**
ER01 **(High)**	Ca. 337m **(Distant)**	0.2% (91 hours) of winds coming from the east (75-105 degrees) **Infrequent**	**Ineffective**

Note: Close receptors include 5 increments of degrees. Intermediate receptors include 4 increments of degrees. Distant receptors include 3 increments of degrees.

The five residential receptors identified were classified as having a high sensitivity to disamenity dust, as the level of amenity expected is high. The public walkway (SR06) was classified as having a medium sensitivity to disamenity dust, people would expect to enjoy a reasonable level of amenity but would not reasonably expect to enjoy the same level of amenity as in their home. The ecological receptor (ER01), a specially designated SAC, was classified as having a high sensitivity to disamenity dust due to its protected status.

Having considered the distance of the receptors from the emission source and the frequency of winds (>5.5m/s) on dry days, the pathway effectiveness was derived for each sensitive receptor.

From Table 9-10 above, the Pathway Effectiveness for human receptors SR01 – SR04 was identified as “Ineffective”. Two human receptors (SR05 and SR06) were determined to have a “Moderately Effective” Pathway Effectiveness.

The Pathway Effectiveness of ER01 was determined to have an “Ineffective” Pathway.

To identify the potential risk of dust impacts on the receptors, the Pathway Effectiveness and Residual Source Emissions were considered together. As the Residual Source Emissions ranged from small to medium (Table 9-9 above), the medium was applied to them all, as recommended by the IAQM Guidelines .

The estimation of dust impact risk from this process is outlined in Table 9-11 below.

Table 9-11: Dust Impact Risk for Sensitive Receptors

ID	Residual Source Emission	Pathway Effectiveness	Dust Impact Risk
SR01	**Medium**	**Ineffective**	**Negligible Risk**
SR02	**Medium**	**Ineffective**	**Negligible Risk**
SR03	**Medium**	**Ineffective**	**Negligible Risk**
SR04	**Medium**	**Ineffective**	**Negligible Risk**
SR05	**Medium**	**Moderately Effective**	**Low Risk**
SR06	**Medium**	**Moderately Effective**	**Low Risk**
ER01	**Medium**	**Ineffective**	**Negligible Risk**

The Risk of Dust Impact has been classified as having a 'Low Risk' at SR05 and SR06 and a 'Negligible Risk' for all remaining human and ecological receptors, without mitigation measures applied.

To identify the magnitude of disamenity effects on the receptors, the Risk of Dust Impact and sensitivity of the receptors were considered together.

The descriptor is outlined in Table 9-12 below.

Table 9-12: Magnitude of Disamenity Effects on Sensitive Receptors

ID	Receptor Sensitivity	Dust Impact Risk	The Magnitude of the Disamenity Effects
SR01	**High**	**Negligible Risk**	**Negligible Effect**
SR02	**High**	**Negligible Risk**	**Negligible Effect**
SR03	**High**	**Negligible Risk**	**Negligible Effect**
SR04	**High**	**Negligible Risk**	**Negligible Effect**
SR05	**High**	**Low Risk**	**Slight Adverse Effect**
SR06	**Medium**	**Low Risk**	**Negligible Effect**
ER01	**High**	**Negligible Risk**	**Negligible Effect**

It is estimated that the magnitude of the disamenity dust effect will be "Slight Adverse Effects" at SR05, with disamenity dust estimated to have a "Negligible Effect" in the remaining receptors. These ratings are made without the consideration of mitigation measures.

9.5 Proposed Mitigation Measures

9.5.1 Dust Mitigation Measures

The dust risk assessment has identified that dis-amenity dust from the Proposed Development could give rise to "Slight Adverse Effect" to identified receptors without any mitigation measures implemented. To reduce this potential effect, and to ensure the applicant implements basic good practice, the following mitigation measures are to be implemented.

Mitigation measures for the Proposed Development are divided into general measures (e.g. site management and design) and those more specific to the operational phase of the Site (e.g. HGV movements).

The development's dust effects showed the highest dust impact risk of "Slight Adverse Effect" based on the Disamenity dust risk assessment. This highest rating should be considered when applying general mitigation measures. Table 9-13 below details the mitigation measures associated with the Proposed Development.

A Dust Management Plan ('DMP') will be prepared for the Site included in Appendix 9-2 and agreed upon with the local authority prior to commencing Site preparation works. The DMP will be implemented during all phases of the Proposed Development. The mitigation measures can be divided into Design Measures, Construction Phases, Operational Phases and Rehabilitation Phases.

Table 9-13: Dust Mitigation Measures

General Mitigation Measures for the Entire Site
Design Measures The design measures to reduce dust will include: • Hedgerows surrounding the Site boundary will be enhanced during the Construction Phase and maintained during the Operational and Rehabilitation Phases. The hedgerows, once mature, should result in dense foliage; • The materials initially excavated from the Site will be used to build embankments along the southern and western boundaries. The berms will be planted to stabilise the soil, reduce dust nuisance occurring, and once established, will mitigate and significantly reduce the risk of disamenity dust leaving the Site boundary in the subsequent Operational Phase; • Extraction of the Site will be done in phases which will help to reduce large areas of exposed soil which reduce the risk of disamenity dust leaving the Site boundary; • A setback of 150m was put in place from the nearest sensitive receptor, which will further reduce the risk of disamenity dust leaving the Site boundary; • HGVs exiting the Site will be via the existing wheel wash; • Site entrance access road will consist of hardstanding minimising exposed surfaces; and, • Exposed surfaces, e.g. topsoil and overburden storage mounds, will be planted with fast-growing plants.
Construction and Operational Phase The following mitigation measures will be implemented to minimise dust generation, during the Construction Phase and Operational Phases: **General** • A DMP must be produced and adhered to; • Record all dust and air quality complaints, identify cause(s), take appropriate action; • Complaints log will be maintained at the Site office, available for review at any reasonable time; • Provide training to Site personnel on dust mitigation measures to be implemented at the Site; • Complete regular inspections of Site works to ensure compliance with the DMP. The frequency of these inspections should be increased to coincide with activities where the risk of impact is higher during dry and/or windy conditions; • Maintain good communication with the local community.
Site preparation

• Soil stripping and overburden handling will be avoided during dry and windy (>5.5m/s) conditions; and • Overburden will only be worked when it contains a high moisture content.
Mineral processing • Crushing and screening will take place within sheltered parts of the quarry to reduce the likelihood of transport of dust via wind; • Dampen material during dry periods prior to crushing operation; • Crushing and screening plant will be used within its design capacity; and, • All plant and equipment will be subjected to routine preventative maintenance.
Material Handling • Materials will be dampened sufficiently during dry conditions; • Dampen conveyers where required from fixed sprays or mobile bowser; • Clearance of any spillage during extraction should be completed regularly to minimise accumulation of loose dry materials; and, • Minimisation of drop heights will be maintained.
Vehicle movements • Abrupt changes in direction will be avoided where possible; • Regular clearing, grading and maintenance of haul routes will be conducted; • Speed restrictions within and around the quarry (15 km/hr); • Vehicles will be evenly loaded to reduce the possibility of spillages; • Dampen haul routes where required using a water bowser; • Daily application of water to haul routes during dry conditions will be completed; • HGVs will pass through wheel wash onto hardstanding prior to leaving the Site; and, • Road sweepers will be utilised to maintain local roads on a need-to basis.

9.5.2 Rehabilitation Phase

Relevant mitigation measures listed in Section 9.6.1 will be implemented during the Rehabilitation Phase, if and as required. Given the proposed rehabilitation design, dust generation is not anticipated to be significant during this phase.

9.6 Cumulative and In-combination Effects

The surrounding landscape of the Site is primarily used for grazing rather than tillage. Due to the nature of surrounding activities, minimal dust is expected to be generated directly from grazing activities. There is potential that land in the vicinity of the Site is used to cut hay and silage. However, these activities will typically occur during the summer months. As such, given the short-term nature of the activities, the cumulative and in combination effects of agriculture on air quality are determined as not likely or significant Potential Cumulative Ambient Dust Effects.

The background concentrations of PM_{10} have been identified and justified in Section 9.3.3. It is considered that the background concentration of PM_{10} selected from Zone D constitutes the cumulative concentration of PM_{10} from the receiving environment.

The potential concentrations of PM_{10} associated with the Proposed Development were outlined in Section 9.4.4.2, which identified there was little risk of the annual AQS being

exceeded given the existing background concentrations and likely process contribution. As such, the potential for cumulative and in-combination effects to arise from ambient dust is not significant.

9.7 Interactions with other Environmental Attributes

- Chapter 5 – Population and Human Health. Air Quality is an important consideration for human health, as potential PM_{10} concentrations can affect human health. However, the assessment of air quality showed there was little risk that the Proposed Development would have exceeded the AQS standards, indicating negligible effect on human health;
- Chapter 6 – Biodiversity: Air quality can potentially impact ecosystems; however, this assessment demonstrated that the emissions to air from the Proposed Development will have no negative impacts on ecosystems;
- Chapter 7 – Land, Soils and Geology: Air-borne dust arising from the Proposed Development is sourced directly from the geology at the Site. This is a key component of air quality at the Site and has been comprehensively considered in this chapter (Chapter 9);
- Chapter 10 – Climate: Potential emissions associated with vehicle movement on-site can influence GHG emissions associated with the Proposed Development. These potential impacts have been further detailed in the climate chapter. Impacts from fugitive dust are determined to be short-term and therefore the impacts on climate are determined as not significant; and,
- Chapter 14 – Material Assets – Traffic and Transport: Air quality can be impacted by increased traffic volumes. However, the changes to traffic volumes was deemed to be not significant as a result of the Proposed Development, and therefore will not impact local or regional air quality.

9.8 Monitoring

It is proposed that the monitoring of dust deposition is carried out at the Site Boundaries, using the Bergerhoff Method once operational, as detailed in Section 9.3.5 and outlined in Figure 9-2 above.

9.9 Indirect Effects

There have been no significant or likely indirect effects identified outside of those previously assessed throughout the Chapter.

9.10 Residual Effects

Based on the receiving environment, type and intensity of activities (associated with the Proposed Development), the residual effects on human health will be ‘not significant’.

Based on the receiving environment, type and intensity of activities (associated with the Proposed Development), the residual effects on receptors from disamenity dust will be ‘not significant’.

Based on the receiving environment, type and intensity of activities (associated with the Proposed Development), the residual effects on ecological receptors from disamenity dust will be ‘not significant’.

9.11 Reinstatement

The Site will be subject to a Restoration Plan following the cessation of extraction on-site. Details of the Restoration Plan are included in Appendix 6-1.

9.12 Difficulties Encountered

There were no difficulties encountered.

10 CLIMATE

10.1 Introduction

This chapter of the EIAR provides a description and assessment of the likely effects of the Proposed Development on climate change in the context of national greenhouse gas ("GHG') emissions and relevant sectoral targets. This chapter also assesses the potential effects to the Proposed Development from identified climate hazards.

10.2 Methodology

The following standards and methodologies were used for determining the potential impacts of the Proposed Development on climate and also the potential impacts of climate on the Proposed Development from the context of climate hazards:

- Wicklow County Development Plan 2022-2028 [5];
- Wicklow County Council Climate Adaption Strategy, 2019;
- Wicklow County Council Summary Report ;
- Wicklow County Council Draft Climate Action Plan ;
- IEMA: Environmental Impact Assessment Guide to Assessing Greenhouse Gases and Evaluating their Significance, 2022 ;
- International Panel on Climate Change: Guidelines for National Greenhouse Gas Inventories, 2019;
- ISO 1406: Part 1 Specification with guidance at the organizational level for quantification and reporting of greenhouse gas emissions and removals, 2018;
- The European Commission – Climate ADAPT ;
- The European Commission – The European Climate Data Explorer ;
- The European Commission – The Copernicus Climate Change Service ;
- Environmental Protection Agency – Climate Ireland ;
- Global Facility for Disaster Reduction and Recovery – ThinkHazard tool; IE
- Department of Communications, Climate Action and Environment – Climate Action Plan 2023;
- Transport Infrastructure of Ireland – Carbon Tool;
- Department of Communications, Climate Action and Environment – National Adaption Framework, Planning for a Climate Resilient Ireland, 2018; and,
- Government of Ireland – Technical Annex B Climate Change Risk Assessment, 2023;

The potential effects of the Proposed Development on climate were determined through an assessment of the sources of GHG emissions from the Proposed Development. The assessment of GHG emissions follows IEMA's Guidance on *Assessing Greenhouse Gas Emissions and Evaluating their significance* . These guidelines specify the use of emission factors, which were sourced from the Transport Infrastructure of Ireland ('TII') Carbon Tool. The TII Carbon Tool is primarily used for lifecycle assessments of national road and rail projects but provides a comprehensive list of emission factors and methods to calculate GHG that are relative to the Proposed Development.

The potential risks of climate change to the Proposed Development have also been assessed by completing a climate risk assessment. By utilising available policy and guidance, the vulnerability of assets associated with the Proposed Development to potential climate hazards

was determined. The identification of climate hazards was achieved through a detailed desk-based review of local, regional and continental scale tools.

Due to the size and nature of the Proposed Development, there are no potential effects on microclimate in terms of wind tunnelling and shading. As such, the potential effects on microclimate will not be assessed.

10.2.1 Policy Context

10.2.1.1 Paris Climate Agreement

The Paris Agreement is a legally binding international treaty on climate change that was adopted by 196 parties at the COP 21 in Paris 2015. The goal of the agreement is to limit global warming to below 2°C, preferably 1.5°C, compared to pre-industrial levels. The agreement aims to reach a global peaking of GHG emissions as soon as possible to achieve climate neutrality by 2050. The agreement includes commitments from all countries to reduce their emissions and work together to adapt to the impacts of climate change and calls on countries to strengthen their commitments over time. The agreement provides a pathway for developed nations to assist developing nations in their climate mitigation and adaption efforts, while creating a framework for the transparent monitoring and reporting of countries' climate goals.

10.2.1.2 National Climate Adaption Framework

The National Climate Change Adaption Framework ('NCCAF') was developed in 2018 , under the Climate Action Law and Low Carbon Development Act of 2015. The aim of the statutory framework was set out as a national strategy to reduce the vulnerability of the country to the negative effects of climate change and to avail of positive impacts. The strategy also aims at improving the enabling adaption through online engagement and civil society, the private sector and the research community.

The key objective of the NCCAF is to support climate action by setting out policy and with a view of becoming more resource-efficient and contributing to the low carbon economy. The extractive industry is not currently identified under the NCCAF; this assessment has, therefore, utilised the plan to provide context only. For the purpose of the GHG assessment, national limits for the Transport and Electricity sectors will be considered. For those emissions not associated with the Transport or Electricity sector, the GHG emissions will be compared to the First and Second National Carbon Budgets (2021 to 2025, 2026 to 2030).

10.2.1.3 Climate Change Risk Assessment

The minister for the Environment, Climate and Communication has launched a set of guidelines to assist local authorities in preparing climate action plans under the Climate Action and Low Carbon Development (Amendment) Act 2021.

These guidelines have been issued under the provisions of the Act and are, therefore, statutory in nature for the respective local authorities to complete. These are outlined in Technical *Annex B – Climate Change Risk Assessment* . The annex was prepared for local councils to aid in preparing climate risk assessments for their constitutes and includes the following:

- Identifying the range of climate hazards that have previously affected the local authority and its administrative area; and,
- Assessing the exposures and vulnerabilities of the local authority and its administrative area to these hazards.

Whilst the Climate Change Risk Assessment has been adapted at a county level and thus a much larger scale than that of the Proposed Development, the basic premise of identification and classification of hazards will be completed as far as practicable.

10.2.1.4 Climate Action Plan 2024

The Climate Action Plan 2024 is the annual update to Ireland's Climate Action Plan. The plan is the first to be prepared in accordance with the Climate Action and Low Carbon Development (Amendment) Act 2021 .

The climate action plan sets out the roadmap to deliver on Ireland's climate ambitions and aligns with the legally binding economy-wide carbon budgets and sectoral emission ceilings that were agreed by the Government in July 2022 . Whilst the extractive industry is not considered in any of the sectors outlined in the Climate Action Plan, specific industries were used for contextual purposes and are discussed in section 10.3.4 below.

10.2.1.5 Wicklow County Council Development Plan 2022-2028

The CDP contains the following Policy Objectives with respect to climate change [5];

> **"CPO:9.33:** *Enhance the competitiveness of rural areas by supporting innovation in rural economic development and enterprise through the diversification of the rural economy into new sectors and services, including ICT-based industries and those addressing climate change and sustainability.*
>
> **CPO 17.27:** *Geological and soil mapping where available shall be considered in planning conditions relating to settlement, excavation, flooding, food production value and carbon sequestration, to identify prime agricultural lands (for food production), degraded/contaminated lands (which may have implications for water quality, health, fauna), lands with unstable soil/ geology or at risk of landslides , and those which are essential for habitat protection, or have geological significance.*
>
> ***RPO 7.7****: To reduce harmful emissions and achieve and maintain good air quality for all urban and rural areas in the Region and to work with Local authorities and the relevant agencies to support local data collection in the development of air quality monitoring and to inform a regional air quality and greenhouse gas emissions inventory."*

10.2.1.6 Wicklow County Council Climate Adaption Strategy

The Wicklow County Council Climate Change Adaption Strategy forms part of the National Adaption Framework ('NAF') which was published in response to the provisions of the Climate Action and Low Carbon Development Act 2015.

The local authority adaption strategy takes on the role as the primary instrument at a local level to:

- Ensure a proper comprehension of the key risks and vulnerabilities to climate change;
- Bring forward the implementation of climate-resilient actions in a planned and proactive manner; and,
- Ensure that climate adaption considerations are mainstreamed into all plans and policies and integrated into all operations and functions of the local authority.

WCC identified the impacts of current weather extremes and recent climatic trends in Wicklow and identified the most important weather events in the last 30 years using data from Met Eireann. These events were categorised into:

- Heatwaves and drought;
- Strong Winds and storms;
- Snow and Ice;
- High sea level coastal flooding; and,

- Heavy Rainfall.

These hazards will be further discussed in the context of the climate vulnerability assessment.

10.2.2 Assessing Greenhouse Gas Emissions

Anthropogenic GHG emissions have a global effect when they are released into the atmosphere over time. Therefore, assessing the effects of GHG emissions of the development at a local level are inconsequential to these global emissions.

Currently, there is no set methodology to evaluate significance criteria or a defined threshold for GHG emissions for the extractive industry. The quantity of emissions from a quarry is dependent on the size and type of activities that are occurring within a site. The main sources of GHG emissions associated with the Proposed Development are from the use of vehicles on-site as well as the operation of plant and equipment.

According to the IPCC 2019 refinement of the 2006 publications of Guidelines for National Greenhouse Gas Inventories, GHG emissions can be split into three categories (or 'scopes'[4].

- Scope 1: Directive emissions from sources owned or controlled by the reporting entity, such as emissions from combustion of fossil fuels in boilers and vehicles;
- Scope 2: Indirect emissions associated with the generation of purchase heat and steam; and,
- Scope 3: Other indirect emissions that occur in the value chain.

For the purpose of this stage of the assessment, potential GHG emissions have been divided into Scope 1, Scope 2 and Scope 3 emissions, as recognised by the ISO 14064 Part 1 standard . Table 10-1 below details the scopes that were considered for this assessment.

The assessment boundary for assessing GHG emissions will only be associated with activities within the Proposed Development boundary.

Table 10-1: Scoped Emissions used in GHG Assessment

Scope	Source
Scope 1 – Direct Emissions	Operation of on-site plant, generators and HGVs
Scope 2 – Indirect Emissions Associated with the Proposed Development	Electricity purchased for on-site facilities
Scope 3 – Indirect Emissions	Employee and LGV movements assumed to be owned by third owned parties

Scope 1 emissions will arise from the operation of plant/equipment and HGVs operated and owned by the Proposed Development. This is provided in terms of total fuel used during a typical year. The plant/equipment expected to be operating on-site within the Proposed Development boundary includes:

- One Excavator;
- One Crusher;
- One Screener;
- One Conveyor
- One Excavator;

[4] Direct and Indirect emissions do not relate to the EIA Directive of "Direct" and "Indirect" effects and are assessed separately.

- Three Wheel Loaders; and,
- One Generator.

It is estimated that the total anticipated diesel usage at the Site is ca. 330,526 litres per annum. Emission factors (kg of Carbon Dioxide Equivalent ('CO_2e') per litre used) were provided by the TII Carbon Tool , which has taken these specific emission factors from databases such as the SEAI and the BEIS to convert GHG's into CO_2e.

It is estimated that there will be 42 loads per day (25 tonnes per load) or 84 HGV movements (42 truck movements incoming and 42 outgoing movements) will be required in a typical day of outgoing aggregates at the Proposed Development. However, to reflect the 'worst-case' scenario, 50 loads per day were used in the GHG assessment for the Proposed Development. With regards to HGV movements distance as a conservative estimate 30km per day (60km round trip) was used for the assessment.

Scope 2 emissions were based on the electricity usage provided by the client in terms of total annual electricity usage, which was estimated at (16,500kWh).

Scope 3 emissions, those indirectly influenced by the operations of the Proposed Development, include vehicle movements not owned by the company (contracted HGVs, employee vehicles and delivery vehicles). With regards to employee movements (Scope 3 emissions), details from the Central Statistics Office estimate that the average worker travelled in 2022 was 16.8 kilometres [29]. As a conservative estimate 17km per day (34km round trip) was used. Therefore, this was used as an estimated distance for both employee vehicles and miscellaneous LGV vehicles. It is estimated that ca. 18 trips (9 incoming and 9 outgoing) will be used per day to cover staff and miscellaneous journeys (as detailed in Chapter 14).

To ensure consistency in the approach, the emission factors used in this assessment assume an average-laden condition for HGVs both entering and leaving the Site.

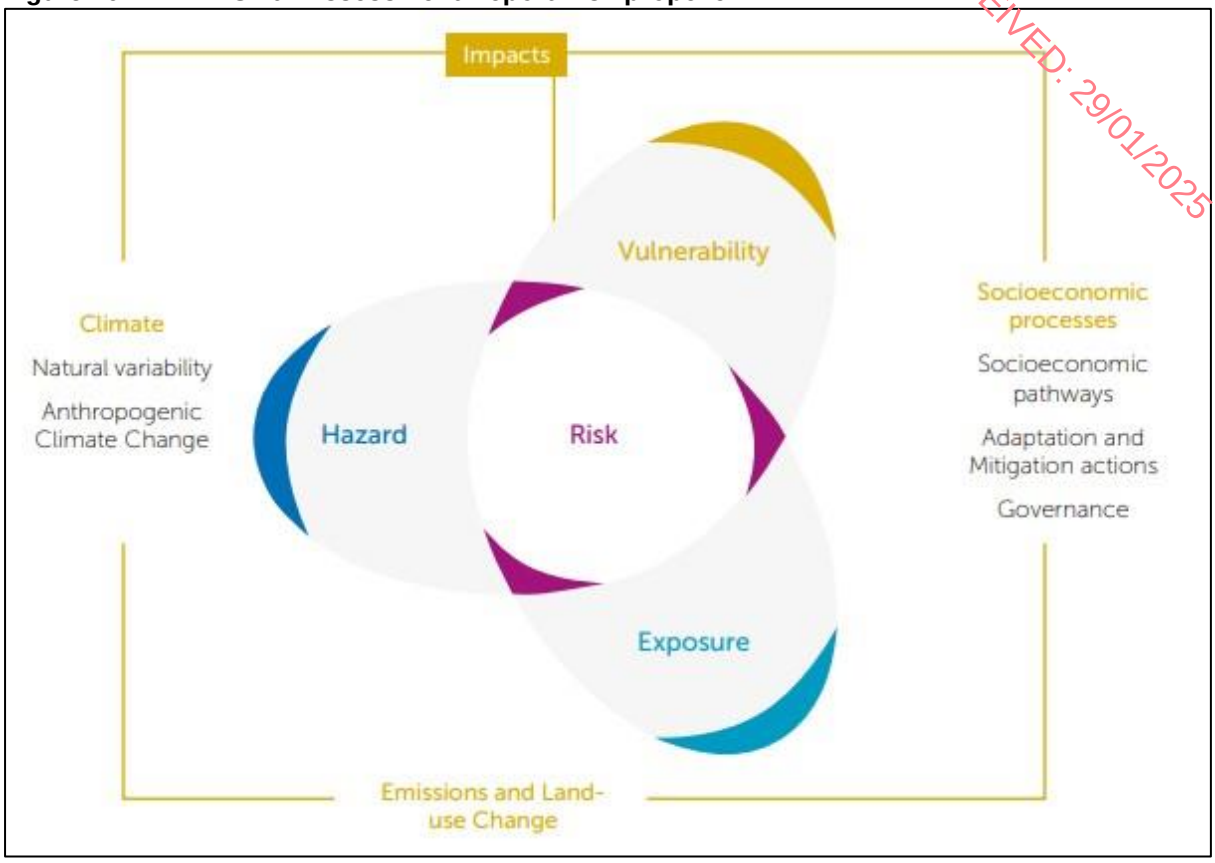
10.2.3 Climate Change Risk Assessment

The IPCC define three key components of a climate risk that interact and combine to generate the risks of climate impacts. These include:

- Hazard: The potential occurrence of a natural or a human-induced physical event or trend (such as a heatwave, heavy rainfall event, or sea level rise) that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provisions, ecosystems and environmental resources;
- Exposure: The presence of people, livelihoods, species or ecosystems, environmental functions, services and resources, infrastructure, or economic, social or cultural assets in places and settings that could be adversely affected (e.g. homes in a flood plain); and,
- Vulnerability: The propensity or predisposition to be adversely affected (e.g. peoples underlying health conditions can be worsened by high temperature or heatwaves).

Figure 10-1 below displays the framework for identifying potential climate risk associated with a development.

Figure 10-1: IPCC Sixth Assessment Report 'risk propeller'



In accordance with the Annex B Guidelines for local councils on identifying and characterising climate hazards, the frequency and the magnitude of impact across various risk areas (from asset damage to reputation) and the exposure of these areas to the potential climate hazards. Due to the scale and nature of the Proposed Development, the climate vulnerability assessment will only be associated with the physical vulnerability of the Proposed Development to climate hazards (present and future) defined as:

> *"Properties of an asset related to the structure or facilities can exacerbate/reduce the impacts before, during or after a hazard event e.g. poor design and construction of building provision of active cooling."*

The impacts of climate risks that will potentially cause disruption to the delivery of services and functions for the Proposed Development are considered as the main focus of this assessment. Descriptions of the level of impacts range from Catastrophic (Widespread service failure with services unable to cope with wide-scale impacts) to Negligible (Appearance of threat but no actual impact on service provision; these are further detailed in Appendix 10-1). The Magnitude of impact, in accordance with the Annex B Guidelines, will only relate to asset damage due to the nature of activities on the Site. The magnitude of impact across the asset damage categories ranges between Negligible (impacts can be absorbed) to catastrophic (Disaster with the potential to lead to shut down or collapse, or loss of assets / network). The frequency of these climate hazards ranges from Rare (<1% occurrence in a year, occurs once in over 100 years) to Very Frequent (>100% occurrence in a year, occurs several times in a single year). Full details on these quantitative / qualitative descriptions are presented in Appendix 10-1.

Future changes in climate hazards will be identified as likely to be of significance if the current climate hazards exposure to the Proposed Development are determined to be significant. A detailed desk-based review of available resources (Climate Ireland, ThinkHazard, Climate-

ADAPT) will be used to determine the potential climate hazards that the Proposed Development may be exposed to in the present and future.

10.3 Receiving Environment

10.3.1 Baseline Climate

The climate of Ireland is primarily driven by ocean influences, mainly the Atlantic, resulting in maritime climate conditions. This results in relative warm summers and mild winters. The wettest months of the year typically occur between November to January. The prevailing wind direction is from the southwest, contributing heavily to the wet weather experienced in the spring and warmer temperatures in the summer.

Typically, climate is averaged weather data over a 30-year period to determine long-term trends in important variables such as temperature, precipitation and windspeed. The period of 30-years is considered long enough to smooth out year-to-year variations. Recently, Met Eireann has compiled a set of climate averages for the period 1991 to 2020

The closest station that has a 30-year average of variables produced for this recent period is the Casement Aerodrome station, located in Co. Dublin (33.6km to the northeast). Table 10-2 below summarises the climate data for the Casement Aerodrome for the period 1991 to 2020.

Table 10-2: Climate Averaged Data from the Casement Aerodrome (1991 to 2020)

Variable	1991 to 2020 Average
Mean Temperature (°C)	9.9
Precipitation (sum of monthly mean in mm)	783.5
Mean of wind speed (kn)	10.1
Mean number of days with gale force winds	16

According to Met Eireann's Climate Average report, which compares the 1961 to 1990 averages to the 1991 to 2020 averages, the following is noted:

- Comparing the 1991 to 2020 annual mean air temperature for Ireland with the 1961 to 1990, there has been an increase in approximately 0.7°C. Spring showed the highest increase (0.8°C), whilst winter showed the smallest increase (0.6°C);
- Annual average rainfall has increased by approximately 7% between the two periods. The greatest increase was seen in the west and north of the country;
- The 30-year average annual distribution of rainfall shows a typical west-to-east decline in the number of rain days and wet days, with east and southeast regions experiencing the lowest number of wet days; and,
- The average annual number of very wet days observed over the period 1991 to 2020 shows that these events are more frequent in the west of the country than in the eastern and midland regions.

10.3.2 Projected Future Climate Change

Observed changes in Ireland's climate over the last century are in line with global and regional trends associated with human induced climate change. Climate projections in Ireland are based on global GHG emission scenarios, predicting the future usage of fossil fuels globally and the corresponding release of GHG gases. The Representative Concentration Pathway ('RCP') is a trajectory adopted by the IPCC. RCP scenario 4.5 (RCP4.5) represents an intermediate scenario with emissions expected to peak in 2040 and then decline . RCP scenario 8.5 (RCP8.5) is the worst-case scenario approach based on an overestimation of projected coal outputs. The range of these scenarios provides an intermediate and worst-case estimation of potential changes in the environment in response to climate change. Based on this range, the following projections were made regarding Ireland's climate:

- Projected seasonal changes in temperature range from 0.9°C to 1.9°C (RCP8.5), with an increase in the duration and intensity of heatwaves expected; and,
- Projected changes in the frequency of very wet days (>30mm of precipitation) range between a 21% increase (RCP4.5) and a 31% increase (RCP8.5).

Projections regarding regional scale sea-level risk and changes in wind speed require more comprehensive research to determine the long-term trends.

10.3.3 Climate Hazards

As discussed in section 10.2.3, climate hazards were identified following a desk-based review of available resources Full details on the hazards identified from the review are presented in Appendix 10-1. For the purpose of this assessment, the following hazards were considered relevant to the vulnerability of the assets associated with the Proposed Development: As identified in section 10.2.3 above, the climate hazards which effect Ireland can be broadly split into:

- Flooding (River);
- Heatwaves / Droughts;
- Cold Snaps;
- Landslides;
- Extreme Rainfall; and,
- Wildfires.

The frequency and level of impact of these hazards will be assessed based on the Annex B Guidelines on Climate Vulnerability Assessments .

10.3.4 National Sectoral Emission Ceiling

The National Sectoral Emission Ceilings refer to the total amount of permitted greenhouse gas ('GHG') emissions that each sector of the economy can produce during a specific period of time.

Under Section 6C of the Climate Action and Low Carbon Development Act (as amended), sectoral emission ceilings are set out to outline the maximum amount of greenhouse gas emissions that are permitted in different sectors of the Irish economy.

The Act commits Ireland to achieve climate neutrality by no later than 2050. The carbon budget programme, which comprises of three successive 5-year periods of national emission ceilings, measured in tonnes of CO_2e (tCO_2e) (Table 10-3 below).

Table 10-3: Ireland's National Carbon Budgets

National Climate Budget	Emission Ceiling for Assessment Period (tonnes of CO_2e)
First Carbon Budget (2021 to 2025)	295,000,000
Second Carbon Budget (2026 to 2030)	200,000,000
Third Carbon Budget (2031 to 2035)	151,000,000

It is outlined that considerations need to be made with regard to how emissions may develop post 2030, to establish a basis for proposals for the provisional third carbon (2031 to 2035).

Within the national carbon budgets, sectoral emission ceilings have been created to reflect the EPA's Emission Inventory. Currently, the sectoral emission ceilings are only presented for the first two carbon budget periods (2021 to 2025 and 2026 to 2030). For GHG emissions associated with the Proposed Development, sectoral emissions for the Transport Sector (Table 10-4) will be used to account for emissions associated with vehicle movements. Emissions associated with the electricity generation will be compared against the Electricity Sector emission ceiling for the respective period (Table 10-4 below).

Table 10-4: Sectoral Emission Ceilings relative to the Proposed Development

Sector	First Sectoral Emission Ceiling (2021 to 2025) (tonnes of CO_2e)	Second Sectoral Emission Ceiling (2026 to 2030) (Tonnes of CO_2e)
Transport	54,000,000	37,000,000
Electricity	40,000,000	20,000,000

Other sources of emissions associated with the Proposed Development, such as the operation of plant and water usage, are not currently accounted for in any of the sectoral emission ceilings under the current Climate Action Plan 2024. As such, these emissions were compared to the first and second national climate budgets, respectively. It is anticipated that emissions beyond 2030 will be influenced by improvements in plant performance, advancements in energy sources, and increased utilisation of renewable energy. Therefore, it is not feasible to extrapolate current estimates of emissions beyond 2030.

10.4 Characteristics and Potential Effects of the Proposed Development

10.4.1 Characteristics of the Proposed Development

GHG emissions will mainly arise from the following activities that will take place at the Proposed Development:

- Movement of HGVs associated with the transport of aggregates to market;
- Use of machinery on-site; and,
- Electricity usage.

10.4.1.1 Site Preparation / Construction Phase

As per the description of the Proposed Development presented in Chapter 3, the Site Preparation Phase will involve blasting, removal of topsoil and overburden. Over the course of the Site Preparation Phase (ca. 12 months), the land will be converted to a quarry landscape, which has the potential to result in net CO_2e loss by the removal of vegetation that would have sequestered carbon. As discussed in more detail in Chapter 6 (section 6.3.2.1), the dominant landscape associated with the Proposed Development is an improved agricultural grassland. As the Site was species-poor in vegetation, the potential for carbon

sequestration was minimal. As such, the net effects of land-use change on GHG emissions associated with the Proposed Development is determined as not significant.

According to the National Stone Sand and Gravel Association , enhanced blasting practices have the potential to reduce electrical energy consumption by minimising the primary and secondary crusher energy requirements. The association outlines that the potential impacts on GHG emissions will be relatively small because indirect emissions due to purchased energy are small at crushed stone and sand-producing plants. As such, the effects of blasting on GHG emissions has been determined as not significant.

10.4.1.2 Operational Phase

The Operational Phase of the Proposed Development is expected to span over 19-27 years and will involve activities such as blasting, mineral processing and haulage of materials to the market. The remaining plant not used during the construction phase identified in section 10.2.2 above will be brought to the Site once the Operational Phase commences.

For the purpose of this assessment, the calculation of GHG emissions will be based on the first two sectoral emission ceilings (2021 to 2025 and 2026 to 2030) as explained in section 10.3.4 above.

To calculate the GHG emissions, a typical year will be used as the basis and then extrapolated over the relative carbon monitoring period. Since the Proposed Development is scheduled to commence in 2024, only two years of CO_2e will be incorporated into the assessment. For the second carbon budget, a total of 5 years' worth of GHG emissions will be assessed.

The GHG emissions associated with the Proposed Development will be sourced from Scope 1 (litres of fuel used per annum by plant machinery and HGV movements), Scope 2 (electricity usage) and Scope 3 (employee and LGV vehicle movements) emissions, which have been identified and discussed in section 10.2.2. above. These emissions encompass direct activities from on-site processing, indirect emissions from purchased electricity, and other emissions associated with the project's supply chain, respectively.

10.4.1.3 Restoration Phase

Upon completion of the extraction activities proposed as part of the Operational Phase, the Site will be subject to a Restoration Plan.

The restoration will be done in line with a Restoration Plan which is submitted with this planning application. The restoration phase of the Proposed Development will provide a mosaic of habitats including woodland areas, boundary vegetation, retained and re-planted treelines, ponds, bare ground scrapes / unvegetated quarry benches and areas of recolonising bare ground. The final restoration phase of the Site will potentially occur in ca. 2048 which is outside the scope of this assessment.

10.4.2 Climate Change Risk Assessment

The Climate Change Vulnerability Assessment determines the sensitivity of the Proposed Development to climate hazards combined with the correspondent exposure of the Proposed Development to these hazards. To determine the potential vulnerability, the receptors associated with the Proposed Development have been divided into the following:

- On-site Assets (e.g. plant, equipment and building);
- Inputs (Electricity);
- Outputs (Mineral Processing, Operating Capacity); and,
- Transport Links.

Table 10-5 below identifies potential impacts to the identified receptors from Climate Change. These impacts were sourced from the UK's Guidance on *Adapting to Climate Change: Industry sector examples for your risk assessment.*

Table 10-5: Potential Impacts on Quarry Receptors from Climate Change

Climate Hazards	Potential Impacts on Quarry Receptors
Temperature-related (cold snaps, heatwaves, droughts)	• Pressures on engine systems, such as bearings or belts; • Fuel storage, both conventional and waste, needs special consideration to avoid spontaneous combustion; • Lower inherent moisture can lead to movement problems and increased dust deposition during mineral processing; • Increased heat or sun exposure can cause the expansion of metallic infrastructure in building elements or tracks, or rapid degradation of materials such as rubbers or plastics; • Wildfires can cause extensive damage to quarry infrastructure; • Working activities may have to be suspended during a wildfire to ensure the safety of their employees and equipment; • Wildfires can cause damage to access roads and transportation routes; • Increased snowing and snow loading could damage buildings and other structures; • Drought restrictions on abstractions may affect the availability of water leading to reduced water for processing use and dust control; and, • Severe cold can lead to contraction of metals and embrittlement of materials such as plastic, rubber and metals.
Wildfires	• Wildfires can cause extensive damage to quarry infrastructure; • Working activities may have to be suspended during a wildfire to ensure the safety of their employees and equipment; and, • Wildfires can cause damage to access roads and transportation routes.
Winds	• Storms and high winds could damage buildings and other structures.
Flooding	• Sea level rise has the potential to cause increased flooding; • Increases in groundwater levels due to sea level rise can cause quarries to become brackish; • Impacts on the wider supply chain infrastructure for critical emissions control plant by docks and road access flooding; • Increased in flow may cause damage caused from flooding; • Bunded areas could get flooded reducing their capacity; • Potential for increased site surface water and flooding; • Increased rainfall can result in the washing of suspended solids from all areas, including stockpiles and roadways causing blocked drainage infrastructure and off-site pollution; and, • Increases in groundwater levels may affect material extraction from the quarry.

Climate Hazards	Potential Impacts on Quarry Receptors
Landslides	• Erosion can lead to the depletion of valuable resources in the quarry, reducing the overall quality and quantity of available resources for extraction; • Landslides and erosion can damage infrastructure beyond the quarry itself; • Landslides can endanger the safety of quarry workers and equipment; and, • Landslides and soil erosion can disrupt quarry operations by blocking access roads and damaging equipment.

10.4.2.1 Frequency of Climate Hazards

Based on the Annex B Guidance on current climate hazards, the frequency of the climate hazards were quantified through an analysis of available information. The frequency scores assigned, rated between 1-5 for each hazard, are justified below.

Table 10-6: Frequency of Climate Hazards

Climate Hazard	Frequency Score	Frequency Description	Justification
Wildfires	1	Rare	According to the Global Wildfire Information Service there is no evidence for wildfire activity within 5km of the Site between 2002 and 2022.
Heatwaves / Droughts	4	Frequent	According to the Met Éireann, the definition of a heat wave in Ireland is shaded air temperatures reaching highs of above 25˚ C on five or more consecutive days at the same location. According to temperature data from a local weather station (Oak Park– ca. 24km to the southwest), the following number of classified warm occurred: • July 2006 (5 consecutive days above threshold); • July 2013(5 consecutive days above threshold); • June 2017 & 2018 (5 and 7 days consecutively above threshold); • July 2018 (10 days consecutively above threshold); • July 2021 (9 days consecutive above threshold); • August 2022 (5 days consecutive above threshold); and, • September 2023 (6 days consecutive above threshold). The frequency of Heatwave/Droughts was given the classification of 'Frequent' as the higher occurrence of heatwaves from 2021-2023.
Extreme Winds	2	Occasional	According to the Met Éireann, the definition of a yellow wind warning in Ireland is widespread mean speeds between 50 and 65km/h. An orange wind warning in Ireland is widespread mean speeds between 65 and 80km/h. According to the wind data from the nearest synoptic station from Oak Park – ca. 24km to the southwest of the Site, there is no evidence of exceedance of yellow or orange wind warnings occurring since 2003.

Climate Hazard	Frequency Score	Frequency Description	Justification
			However, high wind events have occurred nationwide and within the county Wicklow. According to the Wicklow County Council climate change adaptation strategy since 1986 – 2018, ten high wind events have occurred.
Cold Snaps	2	Occasional	According to Met Eireann, a yellow weather warning occurs when low temperatures are expected to be below -3°C. The minimum temperature values from the local Oak park weather station ca. 24km to the southwest indicated the following: • Between 2003 to 2023 the number of times minimum temperatures fell below -3°C was 154 times, including 53 times between 2010 and 2011; and, • Over the last seven years between 2017 and 2023 the levels have fallen below the threshold 29 times, indicating a decreasing frequency of cold spells in the local area.
Extreme Rainfall	3	Common	According to Met Eireann, a yellow weather warning for rainfall occurs when daily precipitation exceeds 30mm in a single day. The daily precipitation values from a local weather station (GlenImaal ca. 6.0km east of the Proposed Development) indicates the following: • Since 1952 to 2000 the number of times daily precipitation exceeded 30mm was 166 times; • Since 2000 to 2022 the number of times daily precipitation exceeded 30mm was 80; • Records show that since 1954, an exceedance in the rainfall threshold would occur on at least one occasion every year: and, • The occurrence of an orange weather warning (>50mm) has occurred 34 times since 1954. The frequency of Extreme Rainfall was given the classification of 'Common' given the occurrence of an orange (>50mm) weather warming since 2000 (13 times).
Flooding	1	Rare	According to flood maps available, the Proposed Development is not located within the bounds of the Catchment-based Flood Risk Assessment and Management (CFRAM) Programme for Low, Medium or High Probability River flood events. The Proposed Development is not located within the boundary of the National Indicative Fluvial mapping – Present Day. The nearest record of a flood event is located ca 1.2km to the west of the Site, at Little Slaney Whitestown (ID-3645).
Landslides	1	Rare	According to the Geological Survey of Ireland (Landslide Susceptibility Map), there are no recorded landslides within 3km of the Site. The susceptibility of the Proposed

Climate Hazard	Frequency Score	Frequency Description	Justification
			Development to landslides has been classified as "Low" to "Moderately High"

It is important to recognise that there can be co-occurrences of multiple hazards (such as prolonged dry temperatures increasing the risk of wildfires). However, given the small spatial nature of the Proposed Development and the rarity of associated hazards, these impacts are not considered further.

10.4.2.2 Potential Impacts of Current Climate Risks

The impacts of current climate risks will result in the disruption to the future delivery of service and function expected to be performed by the Proposed Development. For each of the climate hazards identified, the potential impacts as categorised as "Asset Damage" will be determined in accordance with the Annex B Guidelines (Appendix 10-1). This quantification of potential impacts will be determined for each of the receptors identified.

Table 10-7: Potential Impacts of Receptors to "Asset Damage" as a result of climate change

Receptors	Climate Hazard	Impact Score		Classified Asset Impact	Justification
On-site Assets		Wildfires	2	Minor	The highest impacts associated with on-site assets would be from extreme rainfall, flooding and landslide events. Due to the nature of activities located within a void, assets will be vulnerable to water. However, in more extreme rainfall events given the size of the quarry void water can be stored within the quarry floor. The Proposed Development will create benches on-site which are properly designed and suitable to stabilise slopes to minimise the risk of landslides occurring to on-site assets. The asset damage category of minor is defined as "an adverse event that can be absorbed by taking business continuity action".
		Extreme Winds	1	Negligible	
		Heatwaves/ Droughts	1	Negligible	
		Cold Snaps	2	Minor	
		Extreme Rainfall	2	Minor	
		Flooding	2	Minor	
		Landslides	2	Minor	
Inputs (Electricity and Water)		Wildfires	2	Minor	According to the WCC Climate Adaption strategy, Heatwave/Droughts, Sea level rise, Low temps/Snowfall, extreme rainfall and strong winds have the highest consequence to impact Wicklow. The Proposed Development has access to diesel generators for power supply. Water requirements are marginal, with chemical toilets on-site, bottled water supply for welfare and occasional top-up of wheel wash and dust suppression systems. The asset damage category of minor is defined as "an adverse event that can be absorbed by taking business continuity action".
		Extreme Winds	2	Minor	
		Heatwaves/ Droughts	2	Minor	
		Cold Snaps	2	Minor	
		Extreme Rainfall	2	Minor	
		Flooding	2	Minor	
		Landslides	2	Minor	
Outputs		Wildfires	2	Minor	

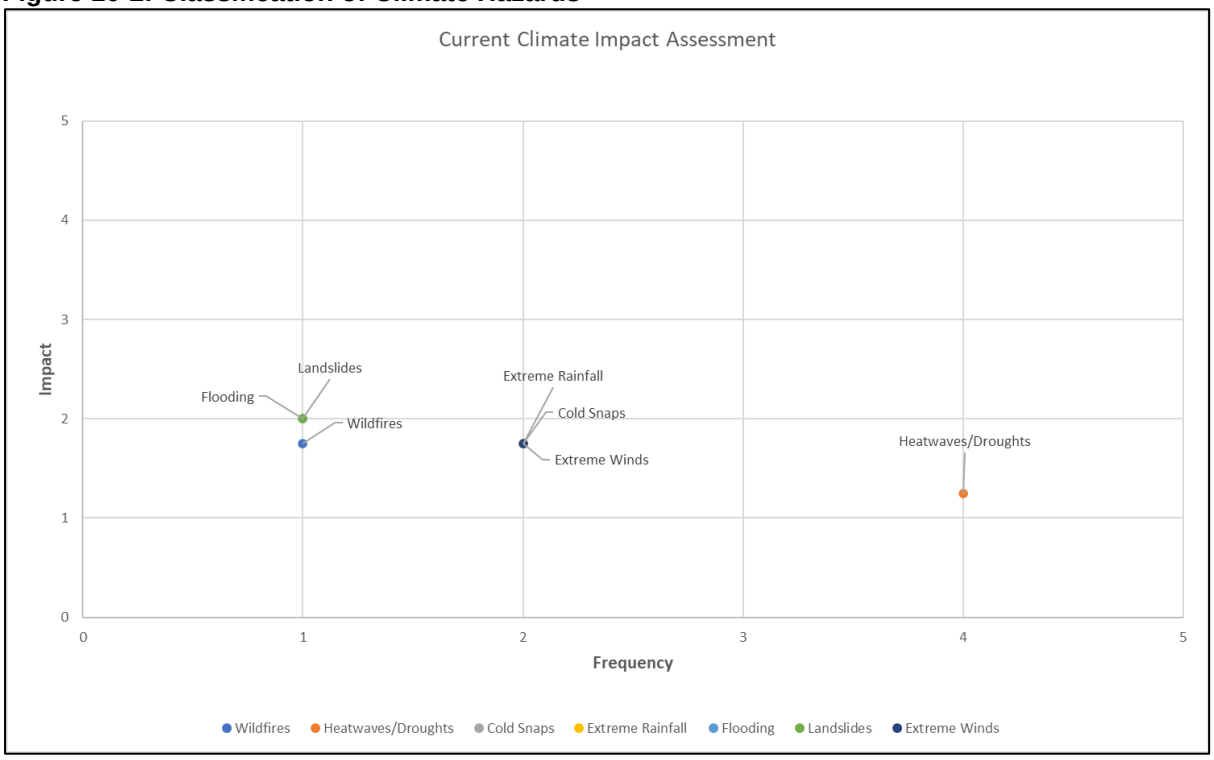
Receptors	Climate Hazard	Impact Score		Classified Asset Impact	Justification
		Extreme Winds	1	Negligible	Due to the nature of activities associated with the Proposed Development (processing and extraction of earth material) the highest level of impact for a hazard was for a flood, extreme rainfall and landslide event. The Proposed Development has access to infrastructure to provide services for the Site in the event of extreme weather events. The asset damage category of minor is defined as "an adverse event that can be absorbed by taking business continuity action".
		Heatwaves/ Droughts	1	Negligible	
		Cold Snaps	1	Negligible	
		Extreme Rainfall	2	Minor	
		Flooding	2	Minor	
		Landslides	2	Minor	
Transport Links		Wildfires	1	Negligible	Due to the nature of activities associated with the Proposed Development (processing and extraction of earth material), the highest level of impact for a hazard was for a flood and landslide event. Due to the infrastructure and the size of the quarry void excess surface water can be stored within the quarry floor to mitigate any impact on haul routes and internal road networks within the quarry void. The asset damage category of minor is defined as "an adverse event that can be absorbed by taking business continuity action".
		Extreme Winds	2	Minor	
		Heatwaves/ Droughts	1	Negligible	
		Cold Snaps	2	Minor	
		Extreme Rainfall	1	Negligible	
		Flooding	2	Minor	
		Landslides	2	Minor	

Based on a qualitative judgement of impacts on assets across all the receptors identified, the frequency and impact score for each hazard was identified and classified for the Proposed Development (Table 10-8 below) with an illustrated graph presented in Figure 10-2.

Table 10-8: Summary of Current Climate Impacts for the hazards identified

Hazard Type	Current Frequency	Current Frequency Score	Average Impact Score (Across all Receptors)
Wildfires	Rare	1	1.8
Extreme Winds	Occasional	2	1.8
Heatwaves/ Droughts	Frequent	4	1.3
Cold Snaps	Occasional	2	1.8
Extreme Rainfall	Common	3	1.8
Flooding	Rare	1	2.0
Landslides	Rare	1	2.0

Figure 10-2: Classification of Climate Hazards



*frequency is measured between 1(Rare) to 5 (Very Frequent). Impact is measured between 1 (Negligible) to 5 (Catastrophic). Further details are presented in Appendix 10-1.

Based on the availability of information, it is not possible to quantify the potential future climate risks associated with wildfires and landslides. Based on this, and their current frequency, the potential effects of these hazards on the Proposed Development are considered not likely and not significant.

10.4.2.3 Potential Future Climate Risk

Understanding how climate change risks may evolve in the future is fundamental to identifying how existing risks may change as a result of climate change.

Table 10-9 below presents the future changes in climate hazards expected due to climate change, based on a desk-based review of the Climate Ireland platform. As assets are expected to remain similar throughout the Operational Phase of the Proposed Development, the level of impacts from these hazards will remain the same. Whilst the Operational Phase of the Proposed Development is expected to cease by ca. 2049 for a complete understanding of future climate risks, the CMIP climate scenarios outlined by Climate Ireland (RCP4.5 and RCP8.5) for the future period 2021-2050 will be discussed.

The Climate Ireland platform was used to determine the potential changes in frequency of these hazards. All climate hazards were assessed relative to the Proposed Development area as far as practicable.

Table 10-9: Future Changes in climate hazards expected due to Climate Change

Climate Hazard	Current Frequency Description	Future Frequency Description	Justification
Flooding	Rare	Rare	According to the CFRAM Flood maps, the Proposed Development does not fall within the Mid-Range / High-End future scenario for Fluvial, or River Flood Extents. Given there is no change in the current and potential future change in frequency of flood events associated with the Proposed Development, the projected frequency of future flooding will remain Rare.
Heatwaves/Droughts	Frequent	Frequent	According to the Climate Ireland platform under RCP4.5 and RCP8.5, the number of heatwaves impacting the area associated with the Proposed Development are expected to increase to 0.1 and 0.15 heatwaves. Given the area associated with the Proposed Development shows higher levels of projected drought occurrences (Figure 10-3), compared to the rest of the country, the frequency of the hazard has been classified as Frequent.
Cold Snap	Occasional	Occasional	According to the Climate Ireland platform, under RCP4.5 the number of ice days (where the number of days when maximum temperature is <0°C) are expected to be 0.1 - 0.5 days between 2021-2050 associated with the Proposed Development. Under RCP8.5, the number of ice days are expected to remain the same at 0.1- 0.5 days over the same period. Due to the low change in frequency expected for ice days, the frequency of cold snap hazards will remain as occasional (Figure 10-5 below).
Extreme Rainfall	Occasional	Occasional	According to the Climate Ireland platform, under RCP4.5 the number of days where precipitation will exceed 20mm (classified as a “Wet Day”) is expected to be ca. 6-9 days. The number of wet days are modelled as 6-9 days under RCP8.5 also (Figure 10-4). Given the existing frequency of current rainfall events, under future climate change, the frequency of extreme rainfall is also classified as Common. No data was available for ‘Very Wet Days’ at the time of writing this report

Figure 10-3: RCP4.5 and RCP8.5 Projected changes in the number of heatwaves (2021-2050)

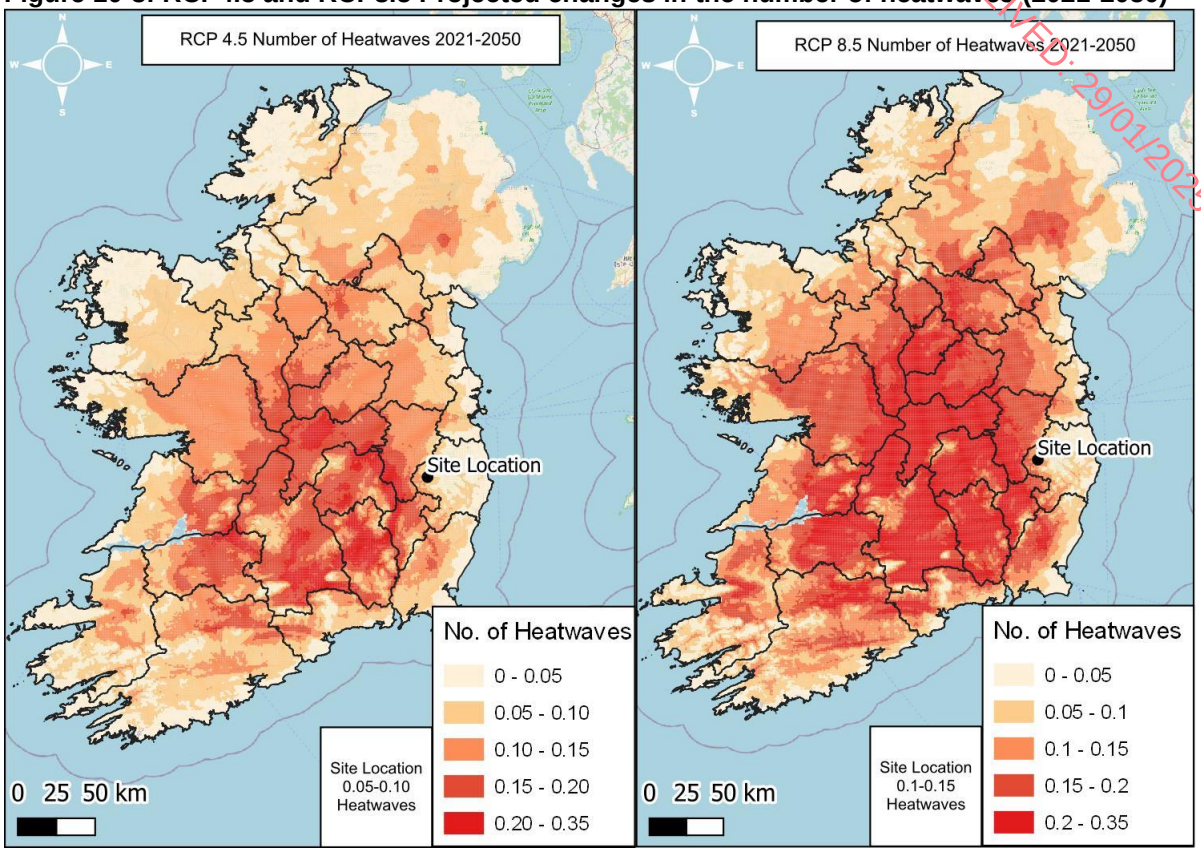


Figure 10-4: RCP4.5 and RCP8.5 Projected changes in the number of Rain Days (2021-2050)

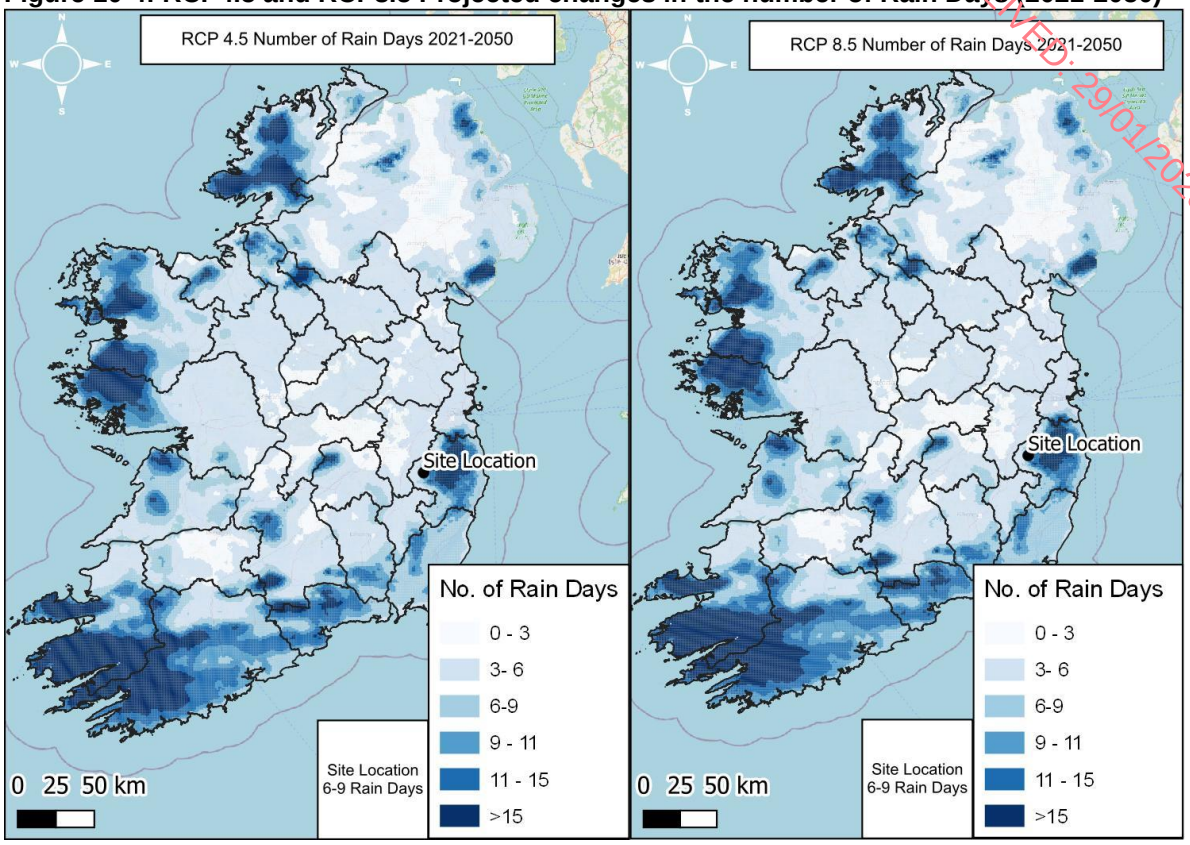
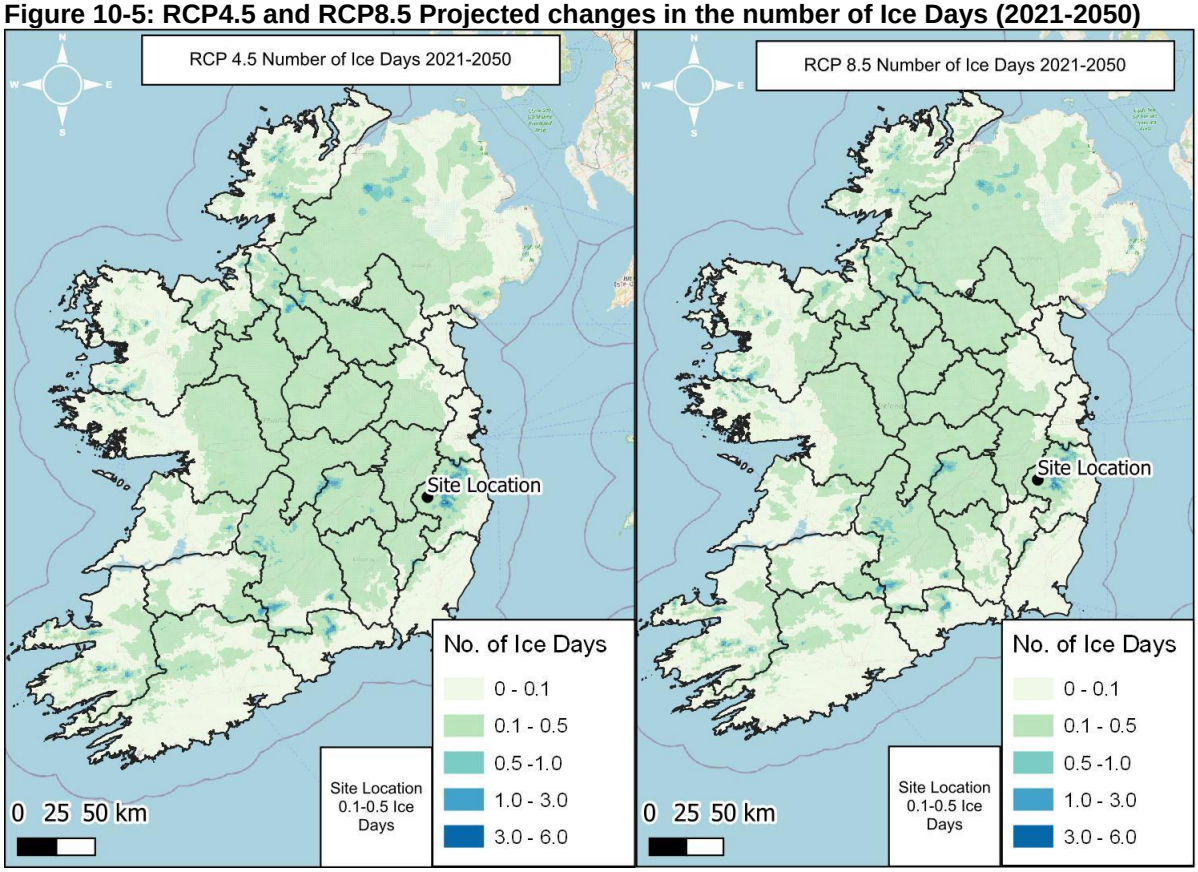


Figure 10-5: RCP4.5 and RCP8.5 Projected changes in the number of Ice Days (2021-2050)



Based on the availability of evidence, the frequency of most climate hazards associated with the Proposed Development will remain the same under future climate conditions. The frequency of heatwaves are expected to increase as a result of future climate change. However, the future frequency is still classified as 'frequent' see Table 10-9 above.

Due to the nature of the hazards identified and their understood change in frequency under future climate change, the County Council Climate Adaption Strategy is deemed appropriate to the scale of activities associated with the Proposed Development.

As the extractive industry is not currently covered as part of the climate adaption strategy for WCC, the indirect adaption measures proposed (such as sustainable management of water resources in response to drought conditions and road improvement schemes as a result of warm weather) are deemed applicable to the Proposed Development. As such the impacts of climate on the Proposed Development are considered not significant in the context of these regional climate adaption strategies.

10.4.3 Greenhouse Gas Assessment

10.4.3.1 Operational Phase

The emissions will be calculated for a typical year (288 days) and were compared against the relevant sectoral emission ceilings to evaluate significance.

The Operational Phase is expected to last up to ca. 19-27 years. However, emissions were not completed past 2030 as the sectoral emission ceilings outline the difficulties in quantifying emissions from sectors post-2030. The extrapolation of emissions associated with the Proposed Development represents a conservative estimation, as changes in technology will likely reduce emissions in the future.

The Proposed Development is expected to use ca. 330,5266 litres of diesel per annum to fuel the on-site plant. These total scope emissions equate to ca. 674.5 tCO_2e being released as a result of this process.

Thus, for the purpose of comparing emissions against the National Carbon Budget (295,000,000 tCO_2e), 674.5 tonnes of CO_2e will be considered representative for a typical year of fuel usage by, machinery and plant operations (Table 10-10 below).

Table 10-10: Scope 1 Emissions in the context of National Carbon Budgets

GHG Emission Source	**Tonnes of CO_2e (per year)**
Scope 1 Emissions (Plant, Machinery Fuel Usage)	674.5
2024 to 2025	**Tonnes of CO_2e (2024 to 2025)**
Cumulative plant emissions for the period 2024 to 2025	1,349
Ireland's First National Carbon Budget 2021 to 2025	295,000,000
Contribution to remaining first sectoral carbon budget (%)	0.0005%
2026 to 2030	**Tonnes of CO_2e (2026 to 2030)**
Cumulative plant emissions for the period 2026 to 2030	3,373
Ireland's Second National Carbon Budget (2026 to 2030)	200,000,000

Contribution to second sectoral carbon budget (%)	0.002%

Scope 1 emissions will contribute to 0.0005% of Ireland First National Carbon Budget and 0.002% to Ireland's Second National Carbon Budget.

Regarding Scope 2 emissions, the 16,500kWh is expected to result in 4.97 tCO_2e across a typical year. Across the period associated with the first sectoral emission ceiling for the Electricity sector (2024 to 2025), this will equate to 9.94 tCO_2e and 25 tCO_2e for the second sectoral emission ceiling period (2025-2030). These low emissions are considered insignificant in the context of the Electricity Sectoral Emission Ceilings (0.00002% and 0.0001%).

Regarding Scope 3 emissions, HGV movements and employee vehicles/transportation tCO_2e was totalled. Table 10-11 shows Scope 3 emissions compared against the sectoral emissions for the Transport sector. It is estimated that at maximum 50 loads per day (25 tonnes per load) or 100 HGV movements are expected which total scope emissions equates to ca. 927 tCO_2e being released as a result of this process. It is estimated that at for employee transport, eight employee vehicles and one light good vehicle ('LGV') are expected which total scope emissions equates to ca. 19.1tCO_2e. Total Scope 3 emissions are estimated to be 946.1 tCO_2e.

Table 10-11: Transportation Emissions associated with the Proposed Development

GHG Emission Source	**Tonnes of CO_2e (per year)**
HGVs and LGVs (deliveries and employee vehicles) associated with Proposed Development	946.1
2024 to 2025	**Tonnes of CO_2e (2024 to 2025)**
Cumulative vehicle emissions for period 2024 to 2025	1,892.25
First Carbon Budget 2021 to 2025	54,000,000
Contribution to remaining first sectoral carbon budget (%)	0.004%
2026 to 2030	**Tonnes of CO_2e (2026 to 2030)**
Extrapolations of vehicle emissions for period 2026 to 2030	4,730.63
Carbon Budget for Transport (2026 to 2030)	37,000,000
Contribution to second sectoral carbon budget (%)	0.01%

It is calculated that vehicle emissions related to the assessment boundary will emit 946.1 tonnes of CO_2e per annum from vehicles, based on a conservative estimation of current technologies. Compared to the sectoral emission ceiling from the first carbon budget based on two years of operations (2024 and 2025), vehicle emissions would contribute to 0.004% of the overall budget. When these emissions are further extrapolated over a 5-year period to reflect the 2026 to 2030 carbon budget, the Proposed Development will contribute to 0.01% of these emissions across the period.

Due to the low contributions of GHG emissions to the relative sectoral emission ceiling and national carbon budgets, the effects of the Proposed Development on climate are determined as "not significant".

10.4.4 Unplanned Events

No unplanned events that would have a major impact on GHG emissions associated with the Proposed Development could occur.

10.5 Proposed Mitigation Measures

Mitigation measures will be introduced to avoid, reduce and replace carbon emissions associated with the Proposed Development. These measures will follow the mitigation hierarchy, which includes the following approaches:

Avoid: The avoidance of GHG emissions involves strategies to minimise emissions by avoiding or reducing activities that contribute to them, including:

- Waste Management: Effective waste management practices, including recycling and composting programmes, to minimise landfill waste and associated methane emissions.

Reduce: The reduction of GHG emissions focuses on implementing measures that minimise emissions during the Construction Phase. These include:

- Plant and Operations: The Operational Phase will reduce the idling of on-site plant when not in use; and,
- Blasting practices: Reduce electrical energy consumption by minimising the primary and secondary crusher energy requirements.

Replace: The replacement approach involves substituting high-emission activities or materials with lower-emission alternatives. These include:

- Site Equipment: Site equipment worn will be reused as far as practicable.

10.6 Cumulative and In-combination Effects

As discussed throughout this chapter, the assessment boundary of this GHG emissions assessment took into account the Scope 1, 2 and 3 emissions anticipated as a result of the Proposed Development. The emissions presented in section 10.4.3 above represent a cumulative assessment of the Proposed Development in the context of national and sectoral emission ceilings up to 2030.

10.7 Interactions with other Environmental Variables

- Chapter 6 – Biodiversity: Climate Change has the potential to impact ecosystems. However, the effects of GHG emissions associated with the Proposed Development was determined as not significant;
- Chapter 8 – Water (Hydrogeology & Hydrology): Climate Change can have a direct impact on water. The frequency of extreme rainfall events is expected to increase with changing climate. Based on current climate information, the vulnerability of the Proposed Development to flooding is considered to be low;
- Chapter 9 – Air Quality: GHG Emissions associated with this development (arising from plants and vehicles) and the main air quality impact associated with this development (dust) so not directly interact; and,
- Chapter 14 – Material Assets: Traffic and Transport. Climate change is directly linked to GHG emissions, with road traffic considered one of the highest contributors to national emissions. The assessment on GHG emissions from HGV movements has shown the effects to be not significant.

10.8 Indirect Effects

All significant and likely impacts have been considered in this chapter. No additional indirect effects were identified during this assessment.

10.9 Residual Effects

The effects of GHG emissions as a result of the Proposed Development will be 'not significant' based on the size and type of the development. These emissions will not have significant impact on National Emissions Ceiling or the Sectoral Emissions Ceilings. The effects of climate on the Proposed Development will be 'not significant' based on the results of the climate change risk assessment.

10.10 Monitoring

No monitoring of GHG emissions is required.

10.11 Reinstatement

The restoration phase of the Proposed Development outlines how the Site will be restored to a mosaic of habitats, including woodland areas, retained and re-planted treelines and a species-rich grassland. Once the restoration is completed, the Proposed Development will likely act as a sink of GHG emissions as a result of a revegetated landscape. However, quantifying this effect is outside the scope of this assessment.

Details of the Restoration Plan are included in Appendix 6-1.

10.12 Difficulties Encountered

No difficulties were encountered.

11 NOISE AND VIBRATION

11.1 Introduction

This Chapter of the EIAR provides a description and assessment of the likely impact of the Proposed Development on noise and vibration.

The following policies relating to the assessment of noise regarding the extractive industry are contained within CDP [5]:

RPO 3.7

> *'Local authorities shall have regard to environmental and sustainability considerations for meeting sustainable development targets and climate action commitments, in accordance with the National Adaptation Framework. In order to recognise the potential for impacts on the environment, Local authorities shall address the proper site/route selection of any new development and examine environmental constraints including but not limited to biodiversity, flooding, landscape, cultural heritage, material assets, including the capacity of services to serve any new development.'*

CPO 12.41

> *'To ensure that all new developments in proximity to National Routes provide suitable protection against traffic noise in compliance with S.I No. 140 of 2006 Environmental Noise Regulations and any subsequent amendments to these regulations.'*

CPO 15.12

> *'To implement the Wicklow County Council Noise Action Plan 2018-2023 (and any subsequent Plan) in order to avoid, prevent and reduce the harmful effects, including annoyance, due to environmental noise exposure.'*

CPO 15.13

> *'To enforce, where applicable, the provisions of the Environmental Protection Agency (EPA) Acts 1992 and 2003, and EPA Noise Regulations 2006.'*

CPO 15.14

> *'To regulate and control activities likely to give rise to excessive noise (other than those activities which are regulated by the EPA).'*

CPO 15.15

> *'To require proposals for new developments with the potential to create excessive noise to prepare a construction and/or operation management plans to control such emissions.'*

CPO 15.16

> *'To require activities likely to give rise to excessive noise to install noise mitigation measures to undertake noise monitoring and to provide an annual monitoring audit.'*

In this Chapter the following is presented:

- Quantifying the existing ambient and background acoustic / sound environment;
- Quantifying the likely construction and operational noise associated with the Proposed Development;

- Assess the likely significance of impacts arising from the Proposed Development; and,
- Outlining the relevant and proportional mitigation measures to the project design.

11.2 Methodology

The following acoustic standards and guidance documents were utilised to evaluate the baseline conditions and in the assessment of impacts:

- Department of Environment Heritage and Local Government ('DEHLG') - Quarries and Ancillary Activities: Guidelines for Planning Authorities, 2004 [12];
- EPA 2006, Environmental Management Guidelines, Environmental Management in the Extractive Industry (Non-Scheduled Minerals), 2006;
- Irish Concrete Federation ('ICF') 2005, Environmental Code, Second Edition, October 2005 .
- BS5228-1:2009+A1:2014, Code of practice for noise and vibration control on construction and open sites, Noise ;
- SI No 140/2006 Environmental Noise Regulations 2006 ;
- ANC Guidelines (Greenbook) Environmental noise measurement guide 2013 ;
- BS4142:2014 Methods for rating and assessing industrial and commercial sound, 2014;
- IEMA Guidelines for environmental noise impact assessment, 2014 ;
- ISO 1996-1:2016 Acoustics - Description, measurements and assessment of environmental noise - Part 1: Basic quantities and assessment procedures 2003;
- ISO 1996-2:2017 Acoustics - Description, measurement and assessment of environmental noise - Part 2: Determination of sound pressure levels;
- NRA Guidelines for the treatment of noise and vibration in National Road Schemes, 2004 ;
- NRA Good practice guidance for the treatment of noise during the planning of National Road schemes, March 2014 ;
- Smith, Peterson and Owens Acoustics and Noise Control, 1996 ;
- World Health Organization's ('WHO') Night noise guidelines for Europe ;
- World Health Organization's ('WHO') Guidelines for Community Noise ;
- Wicklow Noise Action Plan 2011-2023 ;
- Wicklow County Development Plan 2022-2028 [5]; and,
- Aggregate Levy Sustainability Fund ('ALSF'): Sustainable Aggregates Theme 1 - Reducing the environmental effect of aggregate quarrying: Dust, noise and vibration, year unknown .

A glossary of terms utilised within this report is given in Appendix 11-1.

This chapter assesses noise impact arising from the Proposed Development though two distinct means.

An assessment on the likely change in the acoustic environment, as audible at sensitive receptors. This methodology is based on the Institute of Acoustics ('IOA') / IEMA guidelines above.

An assessment on the likely site-specific noise emission audible at sensitive receptors rated against standard limits for noise nuisance. This methodology is in-line with the EPA and government guidelines above.

11.2.1 Criteria Noise Impact

The limits outlined here are taken from guidelines relevant to the Proposed Development and will be utilised to ensure on-site activities can be monitored and noise control implemented. The limits are similar to international criteria for the protection of human health from noise nuisance and protection of human health. These limits will therefore be applied as the criteria within this Chapter for noise impact from the Proposed Development.

11.2.2 Site Preparation (Construction Phase)

Site preparation phase noise will be assessed utilising the British Standard BS5228-1+A1:2014 , which is designed for the assessment of noise arising from construction and open sites.

This standard identifies a methodology (the ABC method, section E.3.2 of standard) for assigning construction noise limits at Noise Sensitive Receptors ('NSRs') based upon the existing ambient noise levels. An excerpt detailing the ABC method is shown in Table 11-1.

Table 11-1: BS5228 ABC Method for Assessing Construction Noise Impact

Assessment category and threshold value period (L_{Aeq})	**Threshold value, in decibels (dB) ($L_{Aeq,T}$)**		
	Category A[A)]	**Category B[B)]**	**Category C[C)]**
Night-time (23:00-07:00)	45	50	55
Evening and weekends [D)]	55	60	65
Daytime (07:00-19:00) and Saturday (07:00-13:00)	65	70	75

Note 1	A potential significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the Site exceeds the threshold level for the category appropriate to the ambient noise level.
Note 2	If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potentially significant effect is indicated if the total $L_{Aeq,T}$ noise level for the period increases by more than 3dB due to site noise.
Note 3	Applied to all residential receptors only.
A)	Category A: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.
B)	Category B: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as Category A values.
C)	Category C: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than Category A values.
D)	19:00-23:00 weekdays, 13:00-23:00 Saturday and 07:00-23:00 Sunday.

This method requires an understanding of the receiving environmental at NSRs to allocate suitable construction noise limits.

11.2.3 Operational Site-Specific Noise

Historical activities at the Site, ambient monitoring and best guidance for quarry noise control issued by the EPA , DECLG Quarry Guidelines [12] and Irish Concrete Federation which detail recommended noise limits of:

Daytime (i.e. 08:00 to 20:00) $L_{Aeq,1hr}$ 55dB(A).

Night-time (i.e. 20:00 to 08:00) $L_{Aeq,1hr}$ 45dB(A).

Under the requirements of the Environmental Noise Regulations 2006 (S.I. No. 140 of 2006) competent authorities have the remit to classify 'Quiet Areas'. The EPA have developed a Quiet Area Screening methodology which has been prepared for this Site. A modification to the setting of limits at baseline monitoring methods are triggered in 'Quiet Areas'.

11.2.4 Site Associated Road Traffic

Vehicles accessing and egressing the Site via the L4320 (Donard Mountain Road) which branches off the L4321 local road and then travel along the surrounding local roads. The surrounding roads are not a major road as per the Environmental Noise Regulations 2006 and therefore no strategic noise maps have been developed.

The Proposed Development will utilise the existing access gate and create internal haul routes within the Quarry. The entrance to the quarry is located along the northwest boundary of the Site. The entrance is located off local road L4320 which branches off the L4321. All HGVs will travel southwest on the unnamed local road before accessing L4321. HGVs will travel west before accessing the N81 and travelling north or south. Return routes follow the routes outlined above.

Traffic from the Site will be restricted from 07:00 to 19:00 Monday to Friday.

This Chapter based on the following has not identified significant and likely impacts arising from the Proposed Development for road traffic noise and it has therefore been screened out of further assessment:

- Existing road traffic movements are established from the existing operation; and,
- No significant change on permitted traffic volumes Chapter 14 (Material Assets).

11.2.5 Site Blasting

During the blasting events, the monitoring criteria are set to ensure the safety of residents and their buildings. There are two distinct aspects that are therefore monitored:

- **Air overpressure** - the sound pressure wave transmitted through the air from the blast. Although much of this sound pressure wave is generated under 20Hz (low frequency), it is accompanied by higher, audible frequencies, ensuring that the sound pressure wave is audible. This is typically due to the inaudible less than 20Hz component, monitored under a dB linear weighting (also known as un-weighted); and,
- **Vibration -** the acoustic pressure wave transmitted through the ground from the blast. Although the pressure is transmitted through the ground, reverberation within surface structures, including building components (glass), can result in an audible emission.

Both air overpressure and vibration are emitted from the source blast in predominately low frequencies, therefore both are predominately sensory rather than audible.

National guidance from the EPA and ICF relating to blast limits at sensitive receptors are outlined in Table 11-2:

Table 11-2: Blasting Limits

Parameter	EPA	ICF
Ground borne Vibration Limit	**Peak particle velocity = 12mm/s**, measured in any of the three mutually orthogonal directions at the receiving location (for vibration with a frequency of less than 40Hz).	The vibration levels from blasting should not exceed a **peak particle velocity of 12mm/s**, measured in any three mutually orthogonal directions at a receiver location. These levels are well below the levels at which structural damage occurs.
Air Overpressure Limit	**125dB (linear maximum peak value) with a 95% confidence limit.**	Blasting should not give rise to air overpressure values **at sensitive locations which are in excess of 125dB (Lin) max pea**k. To allow for wind fluctuations and weather conditions**, 95%** of all air over-pressure levels measured at the nearest noise-sensitive locations **should conform to the specified limit value**. No individual air over-pressure value should exceed the limit value by more than 5dB (Lin).
Other Notes	Normal hours of blasting should be defined (e.g. 09:00 - 18:00 Monday to Friday), and provision should be included to permit blasting outside these hours for emergency or safety reasons beyond the control of the quarry operator. It is recommended that quarry operators provide advance notification of blasting to nearby residents through the use of written notes, signage at site entrance, telephone, or warning sirens (or a combination of these methods).	Planning permissions will normally specify hours of blasting, and the local community should be advised in advance. Blast information, including vibration, air overpressure, explosive charge and distance of the blast from blast-sensitive installation, should be monitored and recorded.

It is proposed within this EIAR that a limit for blasting events, as measured at sensitive receptors, will be in line with the DEHLG and EPA guidance of 12mm per second peak particle velocity ('PPV').

11.2.6 Noise Modelling

Noise modelling was carried out using iNoise version 2024 software. The noise model has been developed for the Proposed Development to incorporate the new noise emission sources and the layout of the local environment. The existing and future noise models only assess site-specific emissions – i.e., it does not incorporate existing ambient sources such as road traffic. The modelling inputs and outputs are presented in Appendix 11-2 and Appendix 11-3.

11.3 Receiving Environment

A review of the locality was conducted utilising OSI online mapping, Google and Bing Aerial Photography.

Based on this research, Noise Sensitive Receptors ('NSRs') were identified in the locality and are shown in Figure 11-1 and described in Table 11-3.

Figure 11-1: Noise Sensitive Receptor Locations

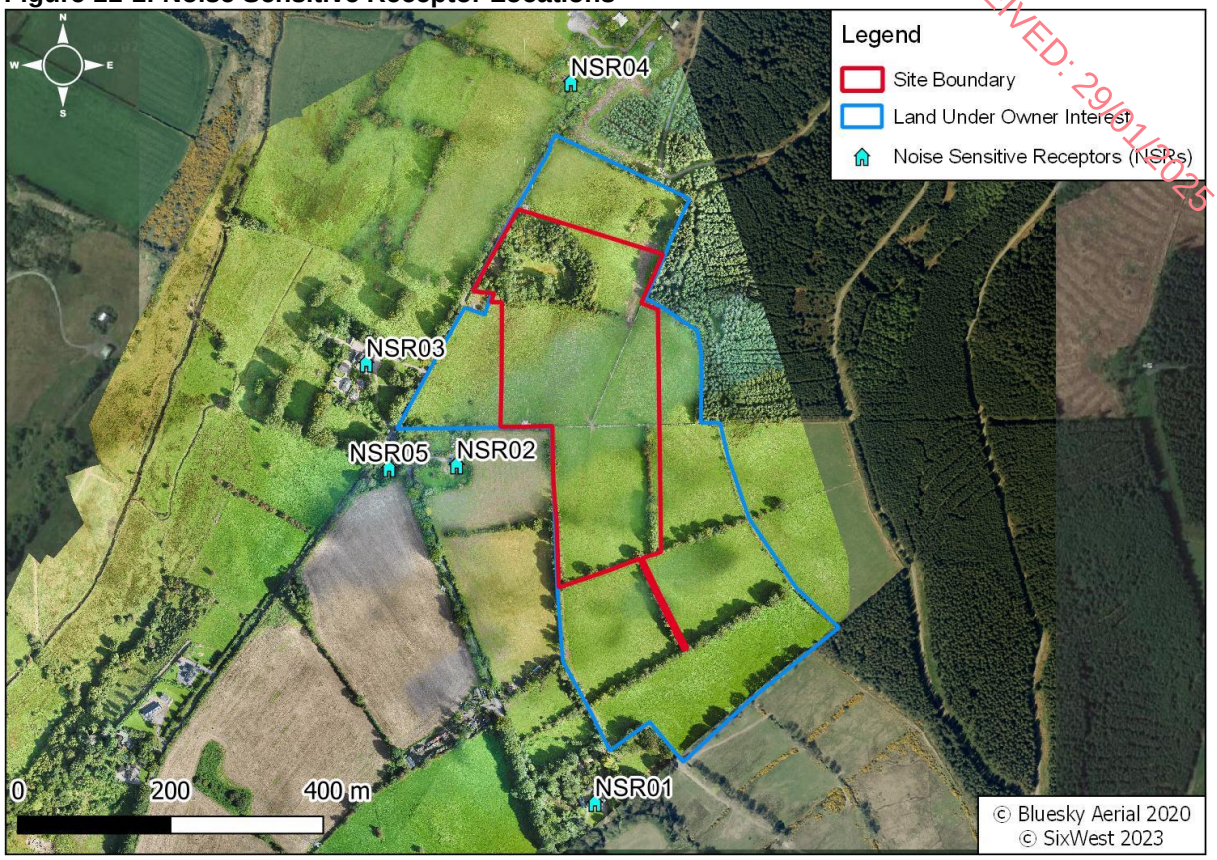


Table 11-3: Identification of Noise Sensitive Receptors ('NSRs')

ID	Location Relevant to Site	Easting (ITM)	Northing (ITM)	Distance to Site Boundary (m)
NSR01	Residential dwelling located to the south of the Site.	691955	694866	ca.230m
NSR02	Residential dwelling located to the west of the Site.	691774	695308	ca.75m
NSR03	Residential dwelling located to the west of the Site. Identified in Chapter 13 as Protected Structure No. 3	691656	695441	ca.168m
NSR04	Residential dwelling located to the north of the Site.	691923	695809	ca.181m
NSR05	Residential dwelling located to the west of the Site.	691686	695304	ca.155m

The Site is in an agricultural area, with several agricultural activities in the immediate locality. It's located east of the N81.

There are several residential properties within the vicinity of the Site, with the closest, NSR02, being located ca. 75m from the Site boundary, refer to Figure 11-1.

11.3.1 Baseline Ambient Sound Assessment

11.3.2 Screening for Quiet Area

Quiet Area is a defined criteria for areas with low intrusion of human activities and have been specified within the Environmental Noise Directive and subsequent S.I. Noise Regulations as areas that should be identified within each Local Authority area for special consideration.

Wicklow Noise Action Plan 2018-2023 define a 'Quiet Area in an Open Country' as

> *"an area, delimited by an action planning authority following consultation with the Agency and approval by the Minister, that is undisturbed by noise from traffic, industry or recreational activities"*

It also states:

> *"Wicklow County Council as the Action Planning Authority may during the lifetime of this Action Plan identifies quiet areas in open countryside and will undertake public consultation prior to any recommendation for approval by the Minister."*

The area of the Proposed Development has not been identified as a quiet area. Wicklow Noise Action Plan 2024-2028 has been reviewed; however, at the time of preparing this assessment, it is draft and not currently enforced.

NG4 identifies a specific screening mechanism for Quiet Areas, and the screening process is shown in Table 11-4.

Table 11-4: Screening for Quiet Area

Parameter	Quiet Noise Criteria Distance	Criteria Met	Note
Distance to an urban area with population >1,000 persons.	>3km	Yes	No distance urban area within the criterion.
Distance to an urban area with population >5,000 persons.	>10km	Yes	
Distance to an urban area with population >10,000 persons.	>15km	Yes	
Distance to local industry (small or individual activities).	>3km	No	Local industry west of the Site.
Distance to major industry centre.	>10km	Yes	No major industry centre within 10km.
Distance to National Primary Route.	>5km	No	N81 road ca. 700m west.
Distance to Motorway or Dual Carriageway.	>7.5km	Yes	No motorway within 7.5km.
Site locality is 'Quiet Area'		**No**	**Proximity to urban areas, industry and National Roads.**

The Quiet Area screening does not identify if an area has high, moderate, or low ambient noise, rather only if the locality is at a distance to select human noise emission sources. Therefore, it is always necessary to monitor the local environment.

NG4 identified that an area could be identified as a Low Background Noise if they satisfy the following criteria:

- Average Daytime Background Noise Level ≤40dB L_{AF90};
- Average Evening Background Noise Level ≤35dB L_{AF90}; and,
- Average Night-time Background Noise Level ≤30dB L_{AF90}.

The three criteria presented above need to be satisfied for any of the measurement locations, so the location is deemed to be in area of low background noise. Only daytime measurements were conducted on the baseline so that statements cannot be conducted.

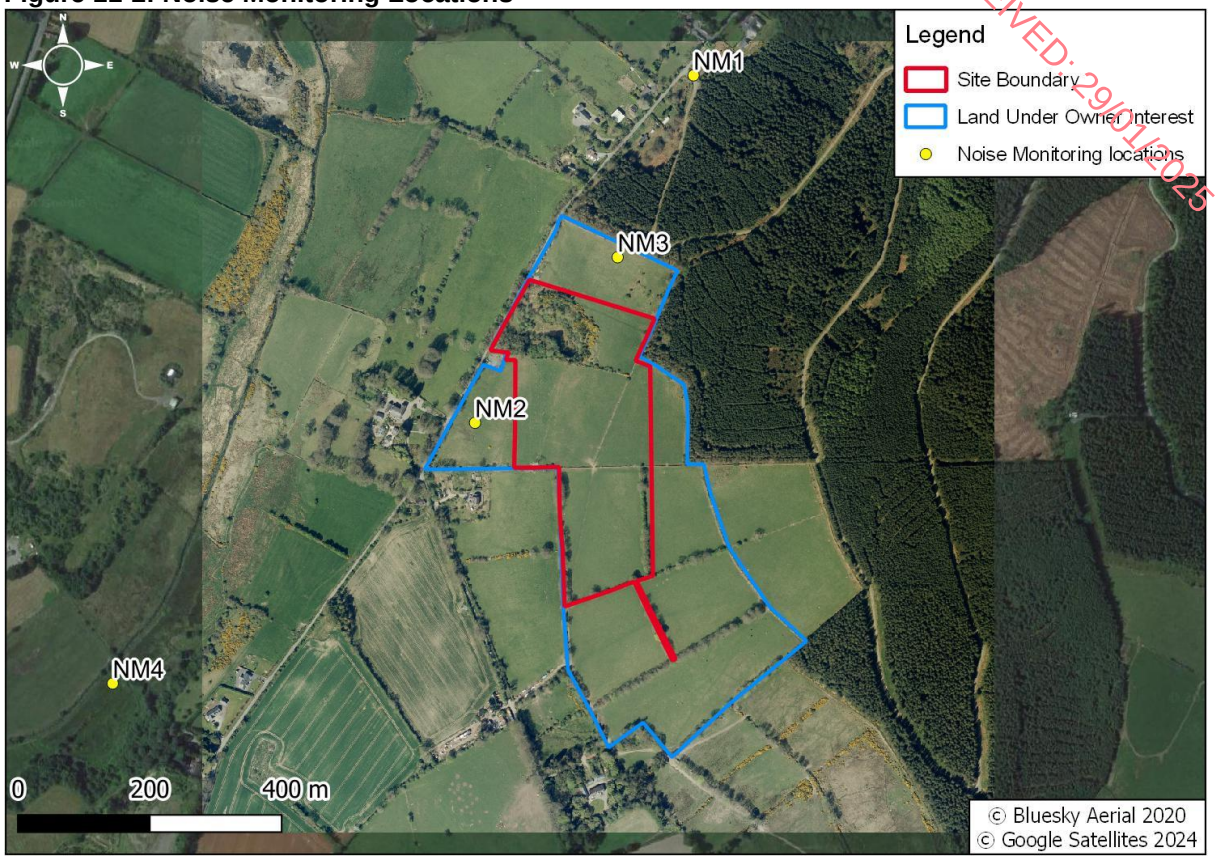
The Proposed Development is only working during daytime hours, and in terms of compliance, this is under the EPA's non-schedules activities criteria presented in Section 11.2.3 above and the government's agreement or government policy on enquiries for environmental management. Baseline Ambient Acoustic Environment Survey

Monitoring locations are identified as boundary or proxy locations to NSRs in Table 11-5 below and shown in Figure 11-2. NSR proxy locations are deemed to be representative of the likely noise audible at NSRs arising from the Site. Boundary locations are at a distance from NSRs and are utilised to evaluate Site-specific or ambient noise levels.

Table 11-5: Noise Monitoring Locations

Monitoring Point	Easting	Northing	Description
NM1	692104	695951	Located north of the Site at the gate entrance of the forest ca. 286m north of the north site boundary.
NM2	691772	695425	Located on the west field boundary of the Site.
NM3	691988	695676	Located on the north field boundary of the Site.
NM4	691223	695029	Located at the river side ca. 566m west of the southwest site boundary.

Figure 11-2: Noise Monitoring Locations



11.3.2.1 Competent Person

The monitoring and analysis of the data was conducted by a MOR Environmental Acoustician. This monitoring programme, data and report was directed and reviewed by a full member of the Institute of Acoustics ('MIOA') and the Association of Acoustic Consultants of Ireland ('AACI') with over 15+ years' experience in environmental and acoustic consultancy.

11.3.2.2 Measurements

Four noise monitoring locations (NM1 – NM4) to characterise local ambient sound levels were undertaken. As there are no activities occurring on-site, the Site is under agricultural use, ambient measurements were taken for a duration of 30 minutes. The four monitoring locations were attended measurements and included: Two readings taken during the daytime.

At all locations, the Sound Level Meter ('SLM') was positioned to maximise distance from reflective surfaces and mounted on a tripod to an approximate height of 1.2 to 1.5 metres over ground level.

11.3.2.3 Equipment

Noise measurements were carried out using a Type 1 Hand-held Analyser SLM (Type 1/ Class 1), equipped with Frequency Analysis Software:

The SLM was laboratory-calibrated within the last 24 months.:

- NTi XL2 Audio Acoustic Hand-held Analyser sound level meter ('SLM'). Serial number: A2A-18871-E0.

The SLM was field calibrated utilising a:

- BK Type 4231 Calibrator. Serial no: 2217952.

The Bruel & Kjaer sound level calibrator type 4231 was laboratory-calibrated within the last 12 months. Broadband noise levels were measured using the A-weighted network and a fast-sampling interval unless otherwise stated.

Laboratory calibration certificates for the two SLMs and the BK 4231 field calibrator are available upon request.

A handheld GPS (Garmin GPS60) was utilised to accurately position the SLM.

11.3.2.4 Weather Conditions

The prevailing weather conditions at the time of measurement were noted and recorded in the survey report. A portable anemometer (Kestral 2500) was used to record wind speed before, during and after the noise survey periods.

The closest meteorological synoptic station is Casement, Co. Dublin ca. 35km northeast of the Site. The summary of the Met Éireann weather data from this synoptic station on the day of the monitoring even is shown in Table 11-6.

Table 11-6: Met Éireann Summary for Synoptic Weather Station

Date	Rainfall (mm)	Max Temp (◦C)	Min Temp (◦C)	Mean Wind speed (knots)	Maximum Gusts (if >34knots)
29/06/2023	tr	19.9	8.2	9.5	-

Weather conditions during the monitoring period were acceptable for the acoustic survey, as per relevant guidance.

A survey of the local ambient acoustic environment was conducted by MOR Environmental on 29th June 2023. The monitoring results of the ambient acoustic environment survey undertaken is detailed below in Table 11-7 below. One-third of octave frequency charts and plates of the monitoring locations are attached in Appendix 11-4.

Table 11-7: Daytime Noise Monitoring Results 29th June 2023

NM	Start Time	Elapsed Time	$L_{Aeq,T}$ dB	L_{AFmax} dB	$L_{AF90,T}$ dB	Commentary
NM1 Run 1	2023-06-29 15:21	0:30:00	48	73	35	A car passes on the main road near SLM. Bird song/call constant. Traffic count 15:22-15:27: 3 cars. Constant engine/generator audible (SW) faint. Plane (W) at 15:24, 15:31 and 15:48. Reverse alarm (SW) at 15:30 and 15:40. Loading (SW) between 15:30 and 15:50. Distant truck (W) driving on between 15:33-50. Wind speed:0-3m/s.
NM1 Run 2	2023-06-29 15:51	0:30:00	50	74	34	Bird song constant. A car passes near SLM. Traffic count: 15:52-15:57: 3 cars. Reverse alarms (SW) at 15:59, 16:02/110/12/17. Truck pass at 15:05 and 15:20. (Highly audible). A dog barks nearby with neighbours speaking at 16:11. Loading (SW) at 16:10/12/18. Plane (W) at 15:53/55 and 16:06. Wind speed:0-3m/s.
NM2 Run 1	2023-06-29 09:55	0:30:00	41	58	35	Bird song/insects (crickets, unknown exactly but similar sound) audible. HGV/Generator audible faintly (W) between 10:10 and 10:20 Car pass at 10:04/09/10/11/14/15/16/17/19/20. Plane (NW) at 09:58, 10:16/24. Dog bark (W) at 10:01 faint. Reverse alarms (W) at 10:10 and 10:14 faint. Loading/banging (W) between 10:11-15 (faint). Wind speed: 0-2m/s.

NM	Start Time	Elapsed Time	$L_{Aeq,T}$ dB	L_{AFmax} dB	$L_{AF90,T}$ dB	Commentary
NM2 Run 2	2023-06-29 10:25	0:30:00	43	60	36	Bird song and insects (crickets) audible. Vehicle pass between 10:25-53. Plane (NW) at 10:29/35/47. Generator/JCB engine audible (NW) between 10:29-10:50 faint. Distant traffic (N, NW) regular. Reverse alarms (W) AT 10:31/36. Bang/loading (W) between 10:32-10:43. Wind speed: 0-2m/s.
NM3 Run 1	2023-06-29 11:25	0:30:00	42	58	38	Bird song and insects (crickets) audible. Wind/leaves rustling. Drilling (SW) at 11:31/33. Reverse alarms (SW) between 11:26-11:46. Loading (SW) between 11:27-11:47. Distant HGV driving (W) on multiple times. A car passes on the public road between 11:27-50. Wind speed: 0-4.5m/s.
NM3 Run 2	2023-06-29 11:56	0:30:00	42	56	38	Bird song and insects. Wind/leaves rustling. Reverse alarms (SW) faint between 11:58-12:26. Loading (SW) between 11:59-12:26. Distant HGV (NW) on a public road at 11:58. Car pass (public road) between 12:00-22. Plane (S) at 11:59. Wind speed: 0-4.5m/s.
NM4 Run 1	2023-06-29 14:01	0:30:00	46	58	40	Bird song. Plane (E) at 14:17. Truck engine idling in distance (W) between 14:07 and 14:30. Loading (W) between 14:09 and 14:30. Reverse alarms (W) at 14:22/23. Horn (W).

NM	Start Time	Elapsed Time	$L_{Aeq,T}$ dB	L_{AFmax} dB	$L_{AF90,T}$ dB	Commentary
						Passing cars on a public road (S) constant. Wind speed: 0-3m/s.
NM4 Run 2	2023-06-29 14:32	0:30:00	46	58	39	Bird song and insects (crickets) audible. Reverse alarms (W) between 14:33-14:37. Loading (W) at 14:36/37/46/51/58. Traffic (S) regular. HGV idling (W) in distance constant. 14:34: Tractor main road. Plane (W) at 14:35/55. Wind speed: 0-3m/s.

11.3.3 Characterisation of the Ambient Acoustic Environment

The noise survey found that the local ambient acoustic environment was influenced by:

- Agriculture - domestic animals, farm machinery and birdsong;
- Industry – Traffic and reverse alarms; and,
- Transport - traffic noise from local road movements.

Generally, higher levels of ambient acoustic sound were found at NM1 and NM4 due to the proximity of the SLM to roads.

The remaining monitoring locations NM3 and NM4 were influenced by birdsong and bird calls, and local traffic passing.

All monitoring locations recorded $L_{Aeq,T}$ values of 41dB to 50dB.

The background ambient acoustic environment for all monitoring locations as $L_{A90,T}$ ranged from 34dB to 40dB.

11.3.4 Conclusion of Existing Ambient Acoustic Environment

Based on the desk-based review of the area and the baseline survey carried out by MOR Environmental on 29th June 2023, it is reasonable to conclude that the ambient existing sound levels surrounding the Site are low to moderate with significant influence at NSRs arising from traffic on the local roads and the distant N81 road.

11.4 Characteristics and Potential Impacts of the Proposed Development

The potential for noise arising from the development has three distinct phases - the Site Preparation Phase, Operational Phase and Rehabilitation Phase. The sources and potential impacts arising from the phases are distinctly different and, therefore, have been discussed separately.

11.4.1 Site Preparation Phase Noise (Construction Phase)

Noise during the Site Preparation Phase will consist mainly of topsoil and overburden removal and construction of soil embankments.

The Site Preparation Phase work will require the use of a bulldozer or similar unit along with an excavator unit for the creation of the embankment.

Table 11-8 below gives typical sound pressure levels ($L_{Aeq,T}$) for typical equipment employed for such works. The Site Preparation Phase will last for 3-4 months.

Table 11-8: Site Preparation Phase Sound Pressure Levels

Plant	Description	Reference	Sound Pressure ($L_{Aeq,T}$) at 10m
Bulldozer	Clearing of soils	C.8.07	75
Excavator	Creation of embankments	C.9.06	91

Activities with negligible sound, such as surveying, planting embankments, etc., have been omitted. Similarly, activities that are characteristic of the agricultural area, including fencing and hedgerow maintenance, have not been assessed.

Table 11-9 below details the construction noise impact at NSRs utilising the BS5228 ABC Method for peak noise associated with the Site Preparation Phase and a combined sound pressure of 91dB at the source.

Table 11-9: Construction Noise Assessment (BS 5228 Example ABC Method)

NSR	Predicted Site Specific Sound Pressure Level $L_{Aeq,T}$ dB	Lowest Measured Ambient Sound Pressure Level $L_{Aeq,T}$ dB	Combined Noise Level (Predicted + Measured Ambient $L_{Aeq,T}$)	65dB Threshold Compliant
NSR01	50	42	51	Yes
NSR02	62	41	62	Yes
NSR03	55	41	55	Yes
NSR04	54	48	55	Yes
NSR05	55	41	55	Yes

All of the NSRs identified will experience less than a $L_{Aeq,1hr}$ of 65dB. These values represent the worst case when the plant will be operational at the extraction area to each of the properties for a constant duration of 1 hour.

11.4.2 Site Preparation Phase Vibration (Construction Phase)

Vibration from the Site Preparation Phase of works is negligible.

11.4.3 Operational Phase Noise

Noise during the Site's Operational Phase will consist of blast preparation, blasting, rock breaking (2-3 days post-blast), crushing, screening and aggregate transport.

The future acoustic emissions will be similar to ongoing activities within the rock quarry. These can be broadly divided into two distinct steps:

- Blasting preparation; and,
- Aggregate processing.

Blasting preparation involves the use of a drilling rig on the top of the bench to be removed. Upon completion of the initial work, the blast event will occur. During the blast event, the Applicant will shut down and remove of all personnel from the quarry as explosives are used to break/shatter a portion of the rock face to the ground. No further activities are conducted until the Site is declared safe.

Aggregate processing is the breaking of the larger boulders, the crushing and screening of aggregate and stockpiling of the aggregate and haulage of the aggregate off-site. This is the primary activity within the quarry.

Table 11-10 below gives typical sound pressure ($L_{Aeq,T}$) values for plant utilised within rock quarries for each of the steps.

Table 11-10: Site Operation Sound Pressure Levels

Plant	Description	Reference	Sound Pressure L_{Aeq} at 10m
Drilling Rig	Tracked rig installing blast holes to 125mm diameter	C.9.01	90
Tracked Excavator	Mounted with rock breaker, operational within quarry floor	C.9.11	93
Wheeled loader	Transporting aggregate within quarry floor	C.9.07	90

Plant	Description	Reference	Sound Pressure L_{Aeq} at 10m
Tracked mobile plant	Crushing and screening of aggregate	C.9.14	90
Lorry / HGV	4 Axle truck movement on-site	C.2.34	80

Three peak scenarios have been assessed where the plant is working simultaneously within the quarry.

There are three operational models for the Proposed Development as presented below:

- Scenario A – Normal operation at the first bench, 179m, includes all the plants presented in Table 11-10 operating simultaneously;
- Scenario B – Normal operation of the quarry at the first bench, 179m, without the Drilling Rig presented in Table 11-10, as the drilling on the top face will only be a short-term event, but it will re-occur during each new phase of the quarry; and,
- Scenario C – HGVs movements only from 7am to 8am, as presented in Section 3.4.1 to as they will have the lower limit specified in Section 11.2.3.

The operational phase of the Site have undergone modelling within specialist noise modelling software iNoise V2024. The results of the modelling are given in Appendix 11-3. The results are predicted at 1.5m and 4m height to represent the ground and first floor typically for daytime and night-time assessment. The Proposed Development will typically operate during daytime periods; however, the maximum of the predicted values is used to represent the worst-case scenario.

Following the construction phase, soil embankments will be in place, and these will offer visual and acoustic screening to all works at the top of the face and will act as an additional acoustic barrier to noise occurring within the Site.

Additionally, the predicted change is the worst-case scenario as only the initial bench has been modelled as the working floor. As the works progress for each bench, the noise will be reduced at NSRs due to the increasing relative height of noise sources to the berms, cliff face and NSRs.

11.4.3.1 Scenario A – Results

The cumulative impact from the ambient acoustic environment and the Proposed Development have been calculated. The cumulative values are shown from the Proposed Development for the Operational Phase of Scenario A and against EPA & ICF limit ($L_{Aeq,T}$ 55dBA) in Table 11-11, with Figure 11-3 showing daytime contours.

Figure 11-3: L_{day} noise contours for Scenario A at 4m height, first bench with drilling rig

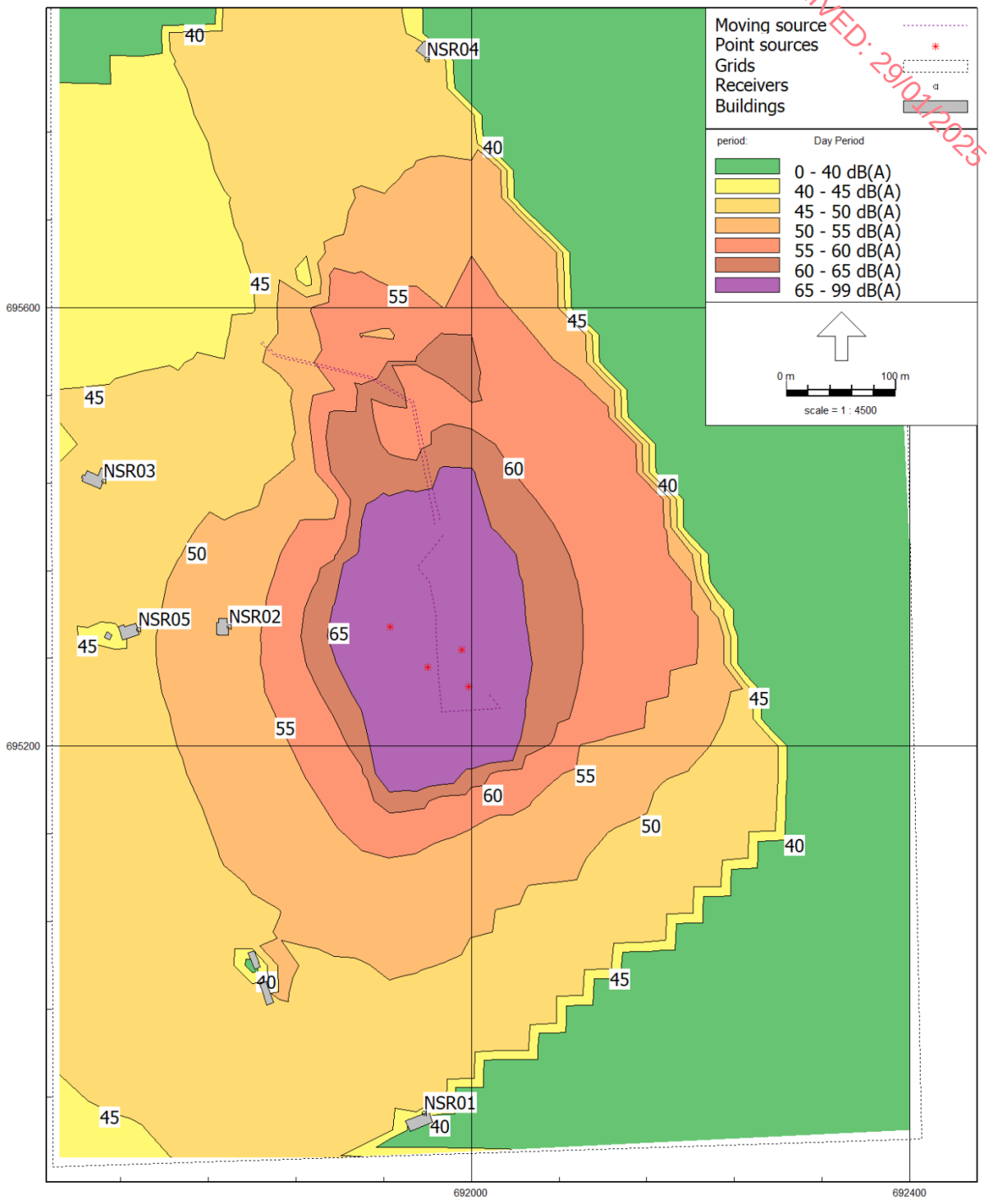


Table 11-11: Operational Noise Assessment Bench – Scenario A with Drilling Rig

NSR	Predictor Output $L_{Aeq,1hr}$ (dB)	Ambient Measured $L_{Aeq,1hr}$ (dB)	Ambient Measured $L_{A90,1hr}$ (dB)	Predicted Cumulative (Predictor + L_{A90}) (dB)	EPA & ICF L_{Aeq} Limit (dB)	Complaint?
NSR01	47	42	38	47	55	Yes
NSR02	52	41	35	52		Yes

NSR	Predictor Output $L_{Aeq,1hr}$ (dB)	Ambient Measured $L_{Aeq,1hr}$ (dB)	Ambient Measured $L_{A90,1hr}$ (dB)	Predicted Cumulative (Predictor + L_{A90}) (dB)	EPA & ICF L_{Aeq} Limit (dB)	Complaint?
NSR03	47	41	35	48		Yes
NSR04	47	48	34	47		Yes
NSR05	50	41	35	50		Yes

Table 11-11 above shows that all NSRs will be compliant with the typical noise nuisance values. The predicted highest site-specific sound levels will be present at NSR02 to the southwest, with $L_{Aeq,T}$ value of 51dBA.

The blast event itself is a short-duration, high-intensity, predominately low-frequency event. An integral part of the operation of the rock quarry is the emission during the blast into the air, which is known as air overpressure. As stated, the predominant sound pressure within this air overpressure is low frequency and inaudible.

As a standard procedure all blast events on the Site will be monitored by the blast specialist for both air-over pressure and vibrations. Receptors within 500m will be informed prior to any blast activity, with monitoring occurring at the closest receptor to the blast.

The blast event is a short duration, locally significant effect. The blast specialist will ensure all blasts will be conducted in line with relevant health and safety requirements, and ensure, through the design of the proposed blast, that air overpressure levels will be below the limits established in Section 11.2.5.

Prior to any blast a blast specification will be developed by the explosive's supervisor, be specific to each individual blast to occur on the Site and take full cognisance of the Site conditions on the day of the blast event. This specification will ensure:

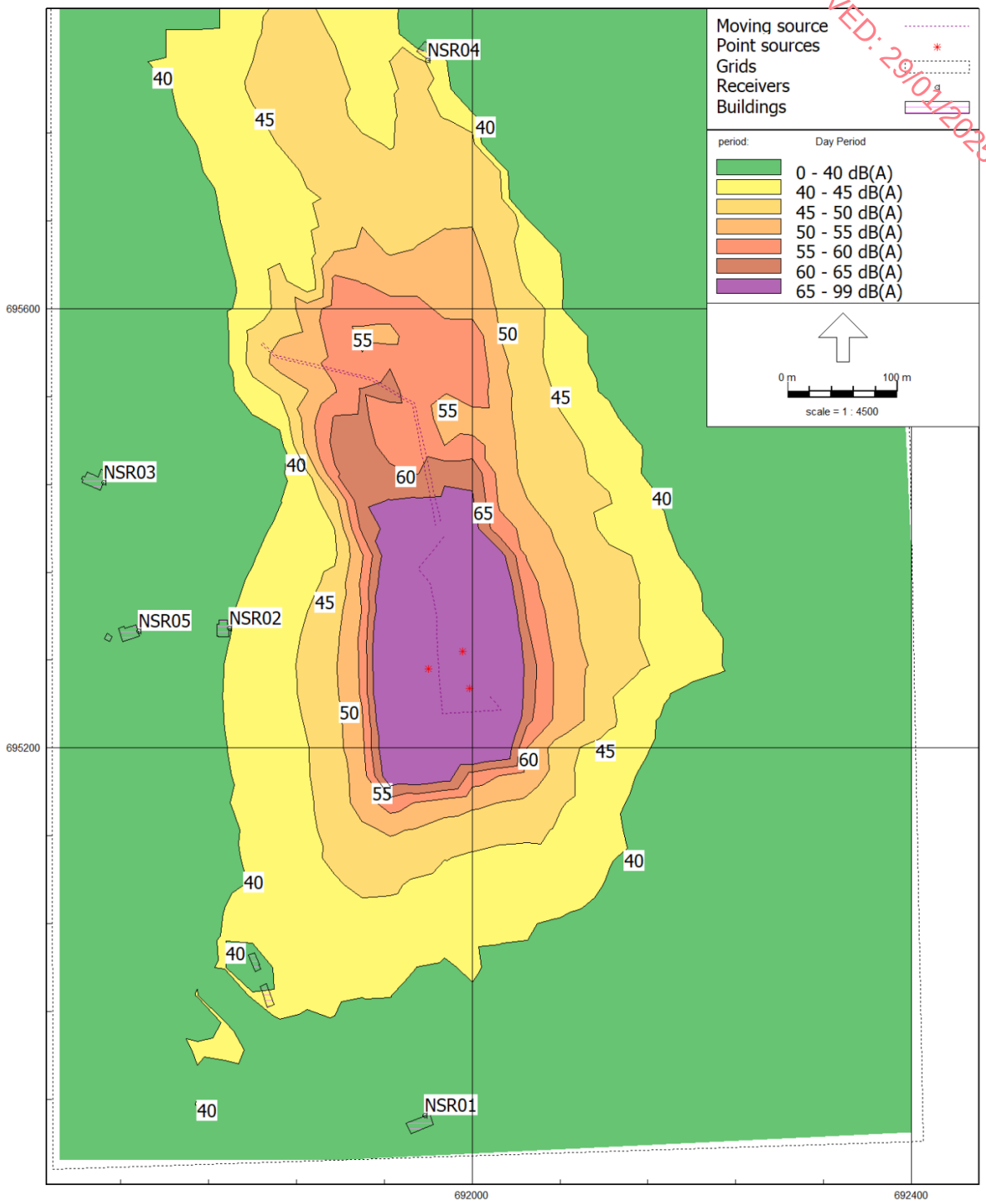
- Minimisation of fly rock being projected outside of the declared danger zone;
- Minimise the risk of misfires; and,
- Enable the location of misfires to be identified;

Ensure faces are left in a safe condition following the blast event.

11.4.3.2 Scenario B - Results

The cumulative impact from the ambient acoustic environment and the Proposed Development have been calculated. The cumulative values are shown from the Proposed Development for the Operational Phase of Scenario B and against EPA & ICF limit (55dB $L_{Aeq,T}$) in Table 11-12, with Figure 11-4 showing daytime contours.

Figure 11-4: L_{day} noise contours for Scenario B at 4m height at first bench



These values are a worst-case scenario and demonstrate that the Proposed Development will operate in compliance with typical noise nuisance criteria at all identified NSRs.

Table 11-12: Operational Noise Assessment Bench – Scenario B without Drilling Rig

NSR	Predictor Output $L_{Aeq,1hr}$ (dB)	Ambient Measured $L_{Aeq,1hr}$ (dB)	Ambient Measured $L_{A90,1hr}$ (dB)	Predicted Cumulative (iNoise + L_{A90}) (dB)	EPA & ICF L_{Aeq} Limit (dB)	Complaint?
NSR01	36	42	38	40	55	Yes

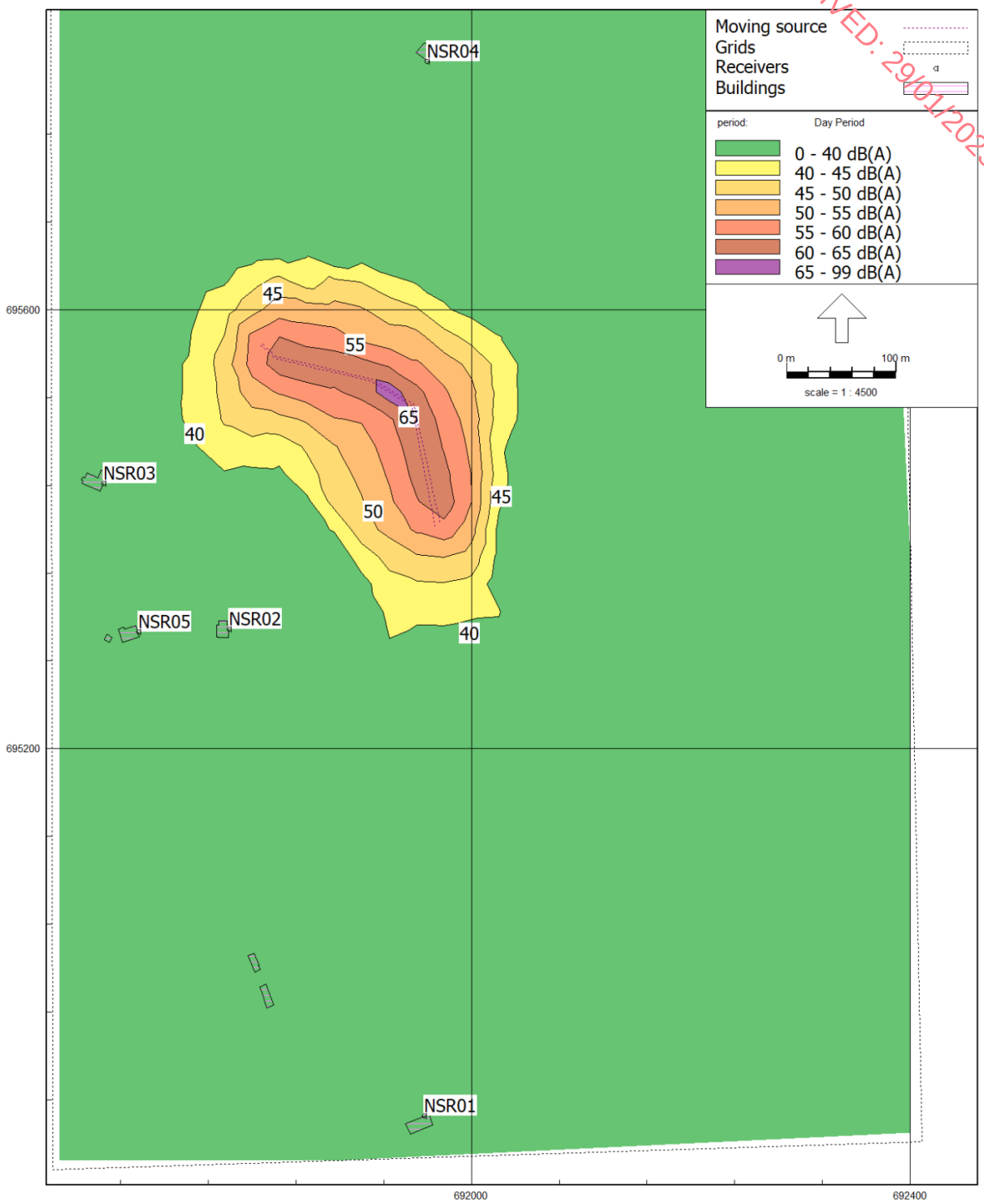
NSR	Predictor Output $L_{Aeq,1hr}$ (dB)	Ambient Measured $L_{Aeq,1hr}$ (dB)	Ambient Measured $L_{A90,1hr}$ (dB)	Predicted Cumulative (iNoise + L_{A90}) (dB)	EPA & ICF L_{Aeq} Limit (dB)	Complaint?
NSR02	40	41	35	41		Yes
NSR03	35	41	35	38		Yes
NSR04	43	48	34	44		Yes
NSR05	37	41	35	39		Yes

Table 11-12 above show that all NSRs will be compliant with the typical noise nuisance values. These values represent the typical operational noise occurring day-to-day within the Quarry.

11.4.3.3 Scenario C – Results

The cumulative impact from the ambient acoustic environment and the Proposed Development have been calculated. The cumulative values are shown from the Proposed Development for the Operational Phase of Scenario C and against EPA & ICF limit ($L_{Aeq,T}$ 45dB) in Table 11-13, with Figure 11-5 showing daytime contours.

Figure 11-5: L_{day} noise contours for Scenario C at 4m height HGV Movement only



These values are a worst-case scenario and demonstrate that the Proposed Development will operate in compliance with typical noise nuisance criteria at all identified NSRs.

Table 11-13: Operational Noise Assessment Bench – Scenario C, only HGVs

NSR	Predictor Output $L_{Aeq,1hr}$ (dB)	Ambient Measured $L_{Aeq,1hr}$ (dB)	Ambient Measured $L_{A90,1hr}$ (dB)	Predicted Cumulative (iNoise + L_{A90}) (dB)	EPA & ICF L_{Aeq} Limit (dB)	Complaint?
NSR01	16	42	38	38	45	Yes

NSR	Predictor Output $L_{Aeq,1hr}$ (dB)	Ambient Measured $L_{Aeq,1hr}$ (dB)	Ambient Measured $L_{A90,1hr}$ (dB)	Predicted Cumulative (iNoise + L_{A90}) (dB)	EPA & ICF L_{Aeq} Limit (dB)	Complaint?
NSR02	26	41	35	36		Yes
NSR03	33	41	35	37		Yes
NSR04	27	48	34	35		Yes
NSR05	27	41	35	36		Yes

Table 11-13 above show that all NSRs will be compliant with the typical noise nuisance values for outside daytime hours. These values represent a worst-case scenario where the 31 loads will occur from 7am to 8am, which is not a typical scenario.

11.4.4 Operational Phase Vibration

Operational Phase vibration will occur during quarry face blasting. Efficient blasting ensures that as much of the explosive energy as possible is utilised for rock fragmentation, and ground vibration and air overpressure is an inefficient use of this energy .

Therefore, the blast event has a short duration, locally significant impact.

11.4.5 Rehabilitation Phase Noise

Noise during the rehabilitation of the Site will be associated with the following:

- Topsoil from the embankments will be spread along with planting to enable the rehabilitation of the Site.

This activity will require minimal plant, consisting of the tractor to spread seeds. Table 11-14 below gives typical sound pressure ($L_{Aeq,T}$) values for plant utilised in quarry restoration sites for each of the steps. The activities will be similar to the Site preparation and will be a finite short schedule of works associated with the closure of the quarry, as per the Guidance of DoHLG , the rehabilitation phase activities are in line with site preparation phase noise values and noise limits set out in section 11.2.2 above.

Table 11-14: Restoration Sound Pressure Levels

Activity	Plant	Description	Reference	Sound Pressure L_{Aeq} at 10m
Restoration	Tractor	Spreading seeds - towing equipment	C.4. 74	71

These activities will predominantly occur within the existing pit floor. The peak site-specific emissions from the Proposed Development at the closest NSR to the extraction area, NSR02 ca. 75m from the Site Boundary, is calculated to be 53dBA. This is below the noise nuisance limits of $L_{Aeq,1hr}$ of 65dBA.

The Proposed Development will not introduce new sound characteristics, nor will the restoration stage present sound qualities typically deemed to be objectionable, such as tonal or clearly impulsive/impact sounds.

Based on the assessment the predicted impact is deemed to be not significant short-term impact on a local basis.

11.4.6 Rehabilitation Phase Vibration

No Rehabilitation Phase vibration is likely.

11.5 Proposed Mitigation Measures

11.5.1 Site Preparation Phase

11.5.1.1 Noise

Based on the assessment conducted here, typical mitigation measures should be implemented as:

- Site Preparation Phase works will be designed to avoid noisy work outside the hours of:
    - Monday to Friday 07:00 to 19:00; and,
    - Saturday 07:00 to 13:00.
- Work occurring outside these hours will be subject to tighter construction stage noise limits, as per BS5228 (Section 11.2.2 of this EIAR);
- Nomination of a responsible person to accept and respond to complaints;
- Ensuring all plant and equipment is serviced and in good repair;
- Avoidance of plant or equipment left idling;
- Planning of works to ensure drop heights from equipment or during demolition are minimised to reduce noise generated; and,
- Noise monitoring programme during construction phase works.

The effects on Site Preparation Phase noise is Not Significant.

11.5.1.2 Vibration

No mitigation required for the Site Preparation Phase relating to vibration control.

11.5.2 Operational Phase

11.5.2.1 Noise

Plant operating hours will be from Monday to Friday, 08:00 to 18:00, and Saturday, 08:00 to 14:00. No quarrying activities will take place on Sundays or Public Holidays.

The associated equipment during the Operational Phase will be in proximity to the working face of the quarry at different intervals during the operational lifetime within the Site. This will aid in reducing noise emissions from the operations on-site. Acoustic berms created during the Site Preparation Phase will also aid in reducing noise emissions from the Site.

The following mitigation measures will be in place as part of the operational phase on-site:

- All plant (fixed and mobile) is maintained to a high standard to reduce any tonal or impulsive sounds;
- All plant is throttled down or switched off when not in use;
- Drop heights of material are minimised;
- Rubber linings are used on chutes and transfer points;
- Where possible, plant and machinery are enclosed or cladded; and,
- Internal routes are reduced in gradients and routed to minimise noise emissions from vehicles on-site.

Air overpressure from a blast is difficult to control because of its variability, however, much can be done to reduce the effect. In line with best practice mitigation measures from vibration

sources, good communication and public relations are a key factor in reducing any startle effects on residents.

11.5.2.2 Vibration

Operational stage vibration will arise during quarry face blast events. The control of the ground-borne vibration will be a key aspect of the blast specialist approach. Design methods to reduce groundborne vibration will include the following items as identified in BS 5228-2 :

- Ensuring appropriate burden to avoid over or under-confinement of the charge;
- Accurate setting out and drilling;
- Appropriate charging;
- Appropriate stemming with appropriate material such as sized gravel or stone chippings;
- Using delay detonations to ensure smaller maximum instantons charges;
- Using decked charges and in-hole delays;
- Blast monitoring to enable adjustment of subsequent charges;
- Blasting should occur between Monday to Friday, 09:00 to 17:00.
- Communications should occur with all residences within 500m of the blast regarding the scheduling of the events;
- Designing each blast to maximise its efficiency and reduce the transmission of vibration; and,
- Avoid the use of exposed detonating cords on the surface in order to minimise air overpressure.

It will be the task of the competent blast engineer to take into consideration the current quarry face, the known geology and modern blasting best practices, to maximise the efficiency and thereby minimise energy loss through ground-borne vibration to the surrounding environment.

11.5.3 Rehabilitation Phase

11.5.3.1 Noise

The Rehabilitation Phase will be temporary insofar as it will be at periodic intervals over the lifetime of the quarry.

The Rehabilitation Phase will be limited to the operational times of 08:00 to 18:00, Monday to Friday and 08:00 to 14:00 on Saturdays. No works will occur on Sundays or Public Holidays.

Mitigation measures as mentioned in Section 11.5.1 will be adhered to including:

- All mobile plant will be maintained to a high standard to reduce any tonal or impulsive sounds; and,
- All mobile plant throttled down or switched off when not in use.

11.5.3.2 Vibration

No likely significant vibration impacts to sensitive receptors during the Rehabilitation Phase.

11.6 Cumulative and In-Combination Effects

The Proposed Development has been assessed in relation to the potential variation in ambient noise levels and found no significant effects.

Residual effects, following the implementation of mitigation measures are assessed to be likely imperceptible and long-term during the construction and operational phases, and likely not significant and short-term during the rehabilitation phase. As such, the Proposed Development will not have a cumulative and in-combination effect with this development either during the construction phase or operational phase.

There are no newly authorised or applied for developments in sufficient proximity to the Site likely to result in cumulative noise effects to identified NSRs.

11.7 Interactions with Other Environmental Attributes

Noise is closely linked with human beings, as residential receptors are the primary noise-sensitive receptors and have been discussed as the primary receptor in this chapter.

Noise can influence fauna through the disturbance of animals, and impacts on specific species have been outlined in Chapter 6 (Biodiversity) where relevant.

11.8 Indirect Effects

All significant and likely impacts have been considered in this chapter. No additional indirect effects were identified during this assessment.

11.9 Residual Effects

The residual noise impact, based on the proposed emissions, phasing and intensity of the Site, the mitigation and practices to be employed and within the context of the existing ambient environment, is deemed to be neutral.

11.10 Monitoring

The operator will conduct the following ongoing monitoring.

All blast events will be monitored at the nearest NSR to the blast for vibration and air overpressure. A ground-borne vibration limit for peak particle velocity of 8mm/s measured in any of the three mutually orthogonal directions at the receiving location (at frequencies less than 40Hz), and an air overpressure limit of 125dB linear with a 95% confidence limit.

General activities on-site will be acoustically monitored on an annual basis at a minimum of three locations, with a site-specific noise limit, measured at the Noise Sensitive Receptor of:

- Daytime (08:00 to 20:00) $L_{Ar,1hr,}$ 55dB; and,
- Night-time (20:00 to 08:00) $L_{Aeq,1hr}$ 45dB.

Any tonal or impulsive characteristics of the site-specific noise emissions, during the day, will accrue a 5dB weighting. No tonal or impulsive characteristics to site-specific noise emissions during the night-time period. 95% of all noise levels shall comply with the specified limit value, with no noise level exceeding the limit by more than 2dB.

The extent and timing of the monitoring shall be agreed upon with the Local Authority in advance. The results of the monitoring shall be submitted to the Local Authority.

Furthermore, prior to any blast event, a public notification programme will be employed to ensure all residents within 500m of the blast are aware of the upcoming blast.

11.11 Reinstatement

The Site will be subject to a Restoration Plan following the cessation of extraction on-site. Details of the Restoration Plan are included in Appendix 6-1.

11.12 Difficulties Encountered

There were no difficulties encountered.

12 LANDSCAPE AND VISUAL

12.1 Introduction

This Chapter of the EIAR describes the likely landscape and visual impacts arising from the Proposed Development in terms of context, landscape character and specific potential views. Although closely linked, landscape and visual impacts are assessed separately.

Landscape Impact Assessment ('LIA') relates to assessing effects of a development on the landscape as a resource in its own right and is concerned with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character.

Visual Impact Assessment ('VIA') relates to assessing effects of a development on specific views and on the general visual amenity experienced by people. This deals with how the surroundings of individuals or groups of people may be specifically affected by changes in the content and character of views as a result of the change or loss of existing elements of the landscape and / or introduction of new elements. Visual impacts may occur from visual obstruction (blocking of a view, be it full, partial or intermittent) or visual intrusion (interruption of a view without blocking).

Cumulative Landscape and Visual Impact Assessment is concerned with additional changes to the landscape or visual amenity caused by the Proposed Development in conjunction with other developments (associated or separate to it), or actions that occurred in the past, present or are likely to occur in the foreseeable future.

The Proposed Development is described in detail in Chapter 3 (Description of the Proposed Development) of this EIAR.

12.2 Methodology

The landscape and visual impact assessment ('LVIA') was completed regarding the sensitivity of the landscape and its vulnerability to change. The assessment considers both the location of visual receptors relative to the Proposed Development and the type of visual receptor.

In addition to the documents outlined earlier in this EIAR, the following documents also formed part of this assessment:

- The IEMA and Landscape Institute ('LI') Guidelines for Landscape and Visual Impact Assessment (2013);
- Environmental Protection Agency ('EPA') publication 'Guidelines on the Information to be contained in Environmental Impact Statements (2022);
- Wicklow County Development Plan 2022-2028 [5]; and,
- Online tourism and recreational amenity resource information for the local area.

The following works were undertaken as part of this assessment:

- Desk based studies including a review of Ordnance survey maps at 1:50000, and 1:2500 maps and satellite imagery to define the scope of the fieldwork required;
- Fieldwork to assess potential impacts on the landscape and potential visual impacts;
- Assessment of the significance of the landscape impact of the development as a function of landscape sensitivity weighed against the magnitude of the landscape impact; and,
- Assessment of the significance of the visual impact of the development as a function of visual receptor sensitivity weighed against the magnitude of the visual impact. This

aspect of the assessment is supported by photomontages prepared in respect of the selected viewpoints.

12.3 Assessment Criteria

Landscape Impact and Visual Impact of the Proposed Development will be assessed using the methodology as detailed in Appendix 12-1.

12.4 Receiving Environment

The baseline represents the existing landscape and visual context and is the scenario against which any changes brought about by the Proposed Development will be assessed. A description of the context of the application site and wider study area is provided.

12.4.1 Definition of the Study Area

From similar studies it is anticipated that the Proposed Development is likely to be difficult to discern beyond ca. 3km and is not likely to give rise to significant landscape or visual impacts beyond ca. 2km. However, in the interests of a comprehensive appraisal, a 3km radius study area is used in this instance except where iconic views exist at greater distances out to 5km.

Figure 12-1: Study Area (blue circle), 3km around Site

12.4.2 Landscape Baseline

The landscape baseline represents the existing landscape context and is the scenario against which any changes to the landscape brought about by the proposed development will be assessed. A description of the landscape context of the Site and wider study area is provided below under the headings of landform and drainage, vegetation and land use, centres of population and houses, transport routes and public amenities and facilities. Although this description forms part of the landscape baseline, many of the landscape elements identified also relate to visual receptors i.e. places and transport routes from which viewers can potentially see the Proposed Development.

12.4.2.1 Landform and Drainage

The Proposed Development is situated along the west-facing slopes of a local hill in the townland of Deerpark that forms part of the foothills of the Wicklow Mountains. Whilst the Proposed Development is situated at an elevation ranging between 165-220m AOD, the summit of the adjacent hill rises to a maximum of 368.7m AOD. To the west, the terrain descends to a broad area of low rolling terrain in the surrounds of the Carrigower River, which

is located some ca. 300m to the west of the Site at its nearest point. The terrain is much more varied to the east as it transitions towards the more upland parts of the Wicklow Mountains in the surrounds of the Glen of Imaal. The River Slaney is one of the more notable watercourses within the study area and is situated some 1.2km south of the Site.

12.4.2.2 Vegetation and Land Use

The land use of the site is principally contained in slopping pastoral farmland bound by networks of mature hedgerow vegetation and mature tree lines. The more elevated lands in the immediate surrounding area of the site are cloaked in commercial conifer forest plantations. The extensive areas of forestry also occur throughout the rolling lands in the wider eastern half of the study area. Nonetheless, pastoral farmland is the predominant land use within the study area, cloaking much of its lowland areas. Other notable land uses include existing quarries and the N81 national secondary route corridor.

12.4.2.3 Centres of Population and Houses

The principal centre of population within the 3km study area is the small village of Donard, which is located along at the intersection of two local roads, some 2.4km north of the site. Otherwise, the study area comprises a modest rural population with the most notable clusters of dwellings situated in the surroundings of the N81 corridor. The settlement of Stratford-on-Slaney is situated just outside of the study area, some 3km southwest of the Site.

12.4.2.4 Transport Routes

The principal transport route in relation to the Site is the N81 national secondary route, located ca. 700m to the west of the Site. The N81 traverse the study area in a general north-south direction, with much of the lands west of the N81 corridor characterised by more non-distinct low-rolling terrain than those to the east, which are influenced by the Wicklow Mountains.

The R412 regional road is the only other major route within the study area, situated some 1.2km northwest of the Site, where it intersects a section of the N81.

Aside from these two routes, all other roads surrounding the Site are third-class local roads, the nearest of which passes immediately west of the Site and links down to another road to the south that runs between the N81 and the Glen of Imaal.

12.4.2.5 Tourism, Heritage and Public Amenities

Whilst the study area itself is not highly synonymous with outdoor recreation, the wider landscape to the east presents strong recreational values associated with the Wicklow Mountains and includes numerous local and national walking and hiking trails. The central study area encompasses some localised heritage assets, which include Castleruddery Stone Circle, located less than 1km south of the Site, and Donoughmore Church and Cemetery, situated ca. 1km southeast of the Site. A local looped walking trail is also located along the forestry tracks on the elevated lands to the north of the Site and is known locally as the Fauna Loop – Donard.

12.4.3 Landscape Planning Context

Landscape Character Types

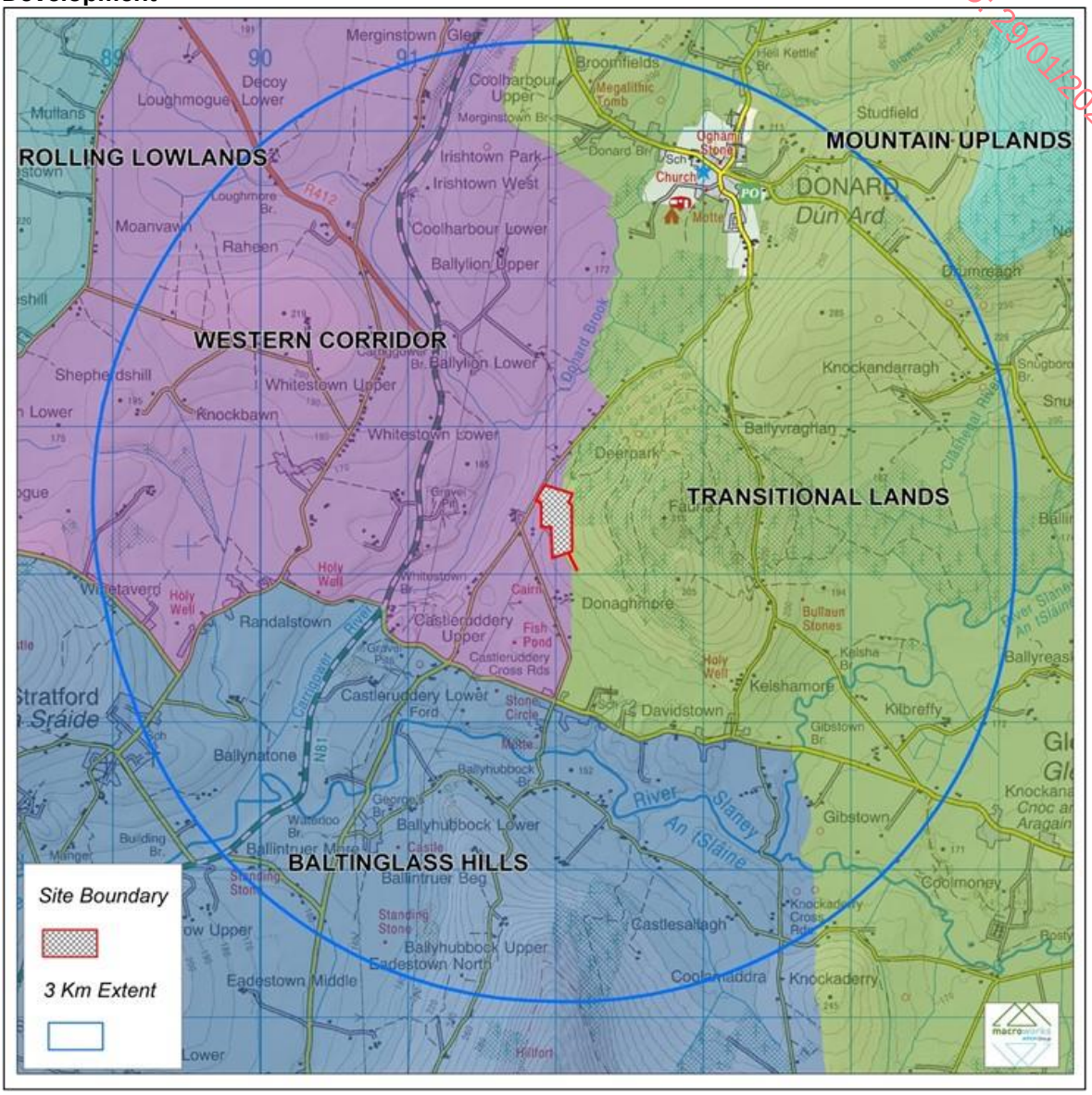
The CDP 2022-2028 contains a number of policies relating to landscape and the following are deemed to be relevant to this Proposed Development:

- ***'CPO 17.35** All development proposals shall have regard to the County landscape classification hierarchy in particular the key landscape features and characteristics identified in the Wicklow Landscape Assessment (set in Volume 3 of the 2016 County Development Plan) and the 'Key Development Considerations' set out for each landscape area set out in Section 5 of the Wicklow Landscape Assessment.'*

- ***'CPO 17.36** Any application for permission in the AONB which may have the potential to significantly adversely impact the landscape area shall be accompanied by a Landscape / Visual Impact Assessment, which shall include, inter alia, an evaluation of visibility and prominence of the proposed development in its immediate environs and in the wider landscape, a series of photos or photomontages of the site/development from clearly identified vantage points, an evaluation of impacts on any listed views/prospects and an assessment of vegetation/land cover type in the area (with particular regard to commercial forestry plantations which may be felled thus altering character/visibility). The Assessment shall demonstrate that landscape impacts have been anticipated and avoided to a level consistent with the sensitivity of the landscape and the nature of the designation.'*
- ***'CPO 17.37** To resist development that would significantly or unnecessarily alter the natural landscape and topography, including land infilling/reclamation projects or projects involving significant landscape remodelling, unless it can be demonstrated that the development would enhance the landscape and/or not give rise to adverse impacts.'*
- ***'CPO 17.38** To protect listed views and prospects from development that would either obstruct the view/prospect from the identified vantage point or form an obtrusive or incongruous feature in that view/prospect. Due regard will be paid in assessing development applications to the span and scope of the view/prospect and the location of the development within that view/prospect.'*

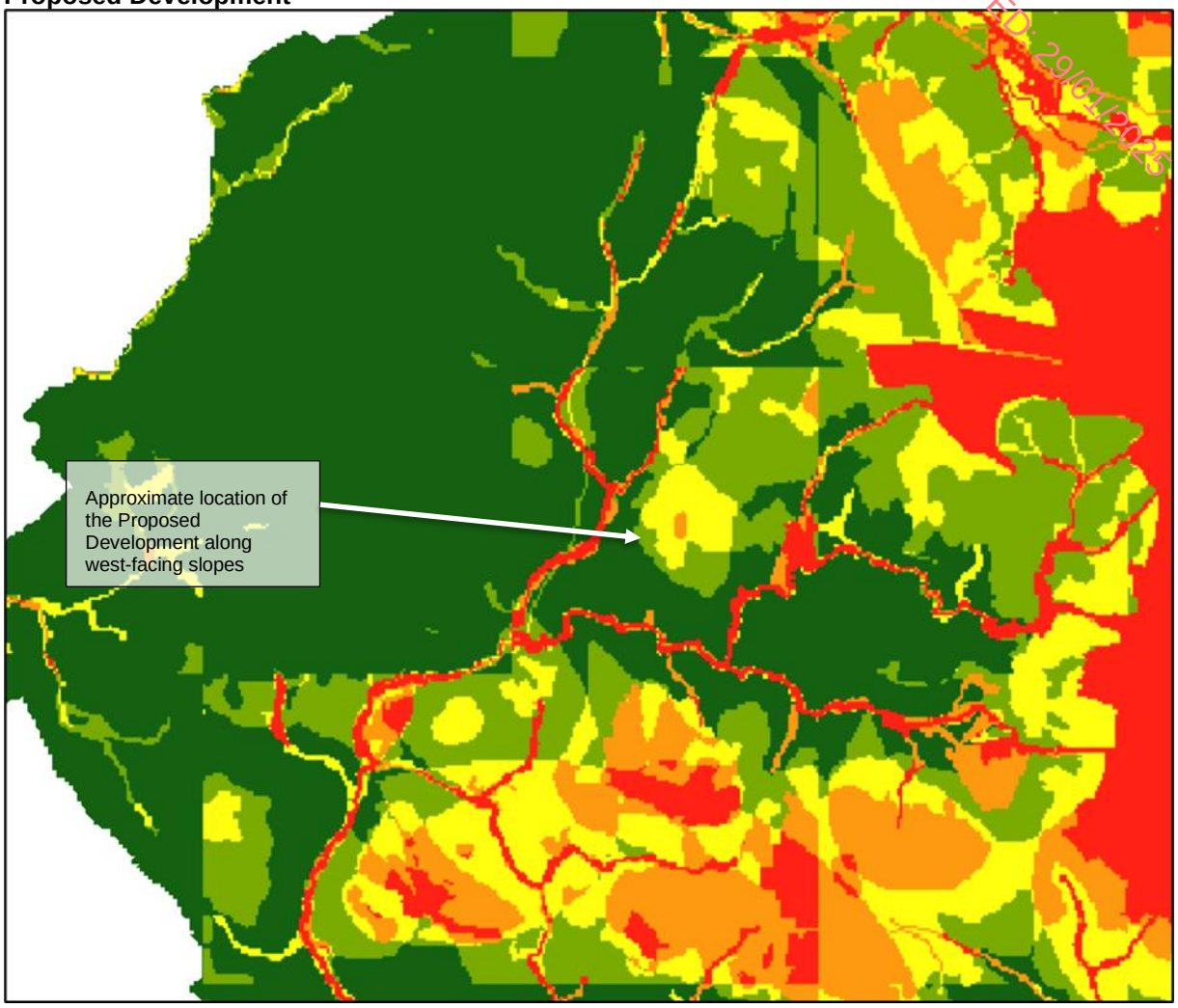
A Landscape Character Assessment was produced for County Wicklow and was incorporated into the current CDP. The Site transcends two (2No.) landscape character types 'Corridor Area West N81' and 'Transitional Lands (5-AHA)', refer to Plate 12-1 below, which shows an excerpt from the current Wicklow County Development Plan – Landscape Character Assessment, showing the landscape character areas in relation to the Site.

Plate 12-1: Excerpt from the current Wicklow County Development Plan – Landscape Character Assessment, showing landscape character areas in relation to the Proposed Development



The sensitivity of the landscape of Wicklow is dealt with at a much finer scale than that of the landscape types and areas. The current landscape assessment weighed factors relating to the natural landscape and factors relevant to the social/cultural landscape in order to calculate the overall sensitivity of the landscape. As per Plate 12-2 below, the Proposed Development is contained across landscape sensitivity classifications ranging between Low to Medium, with the more elevated eastern parts of the site of a 'Medium' sensitivity, whilst the less elevated parts of the site are classified with a 'Low' sensitivity rating.

Plate 12-2: Landscape Sensitivity Classifications in relation to the approximate location of the Proposed Development



Source: Excerpt from the figure 2.1 of the current Landscape Assessment in County Wicklow

12.4.3.1 Scenic Routes and Views

Views of recognised scenic value are primarily indicated within Development Plans in the context of scenic views/routes designations, but they might also be indicated on touring maps, guidebooks, websites, roadside rest stops or on post cards that represent the area.

Under Schedule 17.12 of the current County Development Plan for Wicklow County Council, Prospects of Special Amenity Value or Special Interest are outlined in Chapter 17 of the CDP 2022–2028.

Additionally, Chapter 10, Heritage, of the Wicklow County Development Plan 2016–2022 provides lists and maps of designated scenic views and prospects. Scenic views located within the 3 km study area are as follows:

- **Prospect 48**: N81 at Merginstown Glen – Prospect of Carrigower river valley.

All scenic designations within the study area have been visited during fieldwork investigations. Where there is potential for visibility of the Proposed Development, a representative view has been included within the visual impact appraisal below.

12.4.3.2 National Parks & Wildlife Service

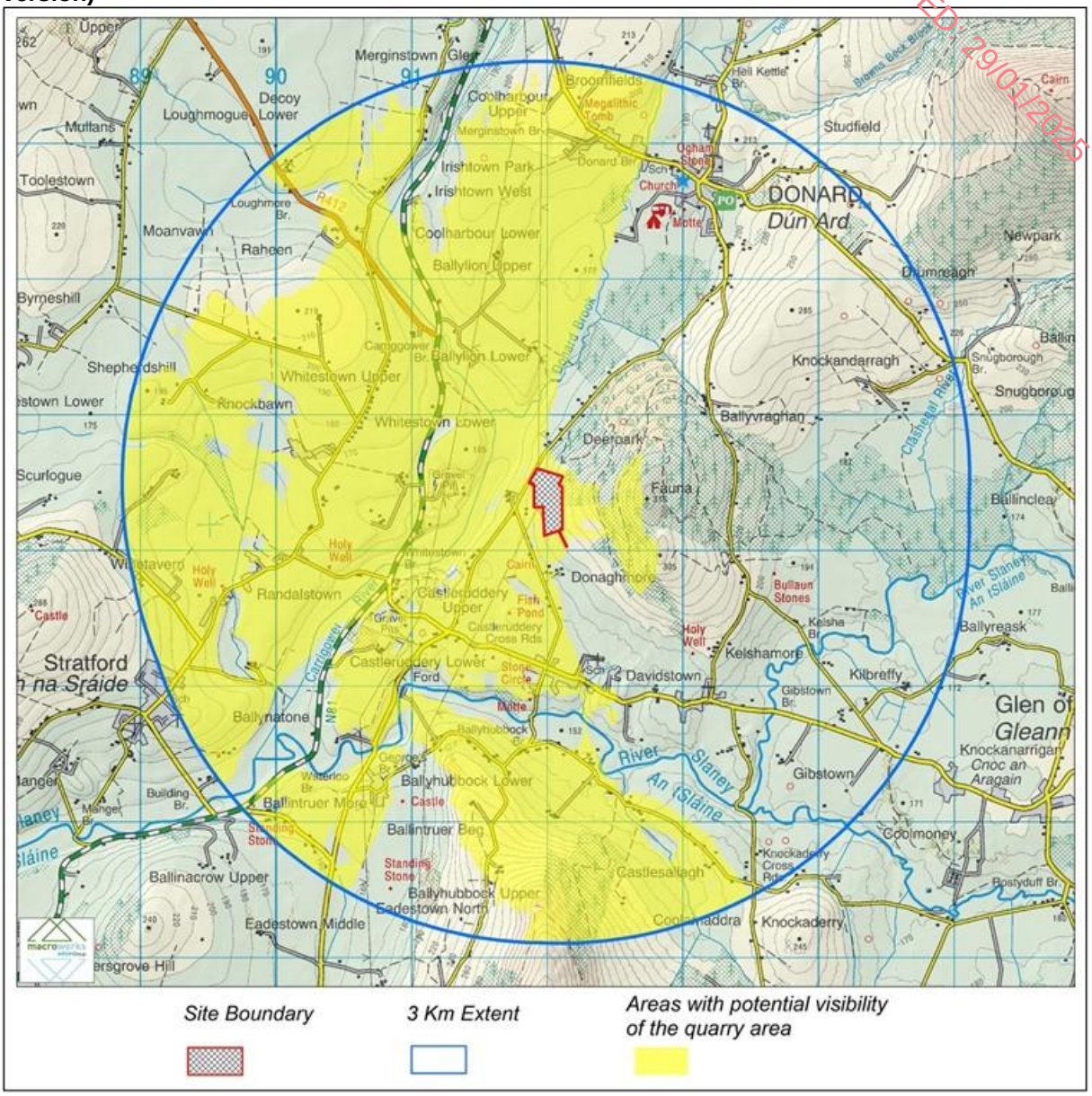
According to the National Parks & Wildlife Service ('NPWS'), within the study area there no Natural Heritage Areas, proposed Natural Heritage Areas or Special Protection Areas. There are two (2No.) Special Areas of Conservation within 5km of the Site.

12.4.4 Visual Baseline

12.4.4.1 Zone of Theoretical Visibility

Areas of the receiving environment that potentially afford views of the Proposed Development will be the focus of this section of the assessment. A computer-generated Zone of Theoretical Visibility ('ZTV') map has been prepared to illustrate where the Proposed Development is potentially visible from. The ZTV map is based solely on terrain data (bare ground visibility), and omits features such as trees, hedges or buildings, which may screen views. Given the complex vegetation patterns within this landscape, the main value of this form of ZTV mapping is to determine those parts of the landscape from which the Proposed Development will definitely not be visible, due to terrain screening within the 3 km study area.

Plate 12-3: Standard (bare ground) ZTV Map for Site (Refer to Appendix 12-2 for larger scale version)



The following key points are illustrated by the 'bare-ground' ZTV map (see Plate 12-3 above):

- Due to the west-facing location of the Site, a considerable proportion of the eastern half of the study area will have no visibility of the Proposed Development. Indeed, the only areas of potential visibility of the Proposed Development to the east are the summit of the local hill immediately east of the Site and some localised parts of the study area to the southeast of the site in the surroundings of the River Slaney; and,
- As a result of the Site's west-facing nature, much of the western half of the study area will afford comprehensive visibility of the proposed extraction area. Some localised areas will be entirely screened in the western half of the study area. However, the majority of this aspect of the study area will have the potential to afford visibility of the Proposed Development.

The most important point to make in respect of this 'bare-ground' ZTV map is that it is theoretical. The Proposed Development is predominantly in-ground and will therefore be considerably screened by surrounding and intervening hedgerow vegetation, trees and

numerous buildings, walls etc., throughout the study area, resulting in a much lesser degree of actual visibility.

12.4.4.2 Identification of Representative Viewpoints

Viewshed Reference Points ('VRP's') are the locations used to study the visual impacts of a proposal in detail. It is not warranted to include each and every location that provides a view of a development as this would result in an unwieldy report and make it extremely difficult to draw out the key impacts arising from the Proposed Development. Instead, the selected viewpoints are intended to reflect a range of different receptor types, distances and angles. The visual impact of a Proposed Development is assessed by MacroWorks using up to 6 no. categories of receptor type as listed below:

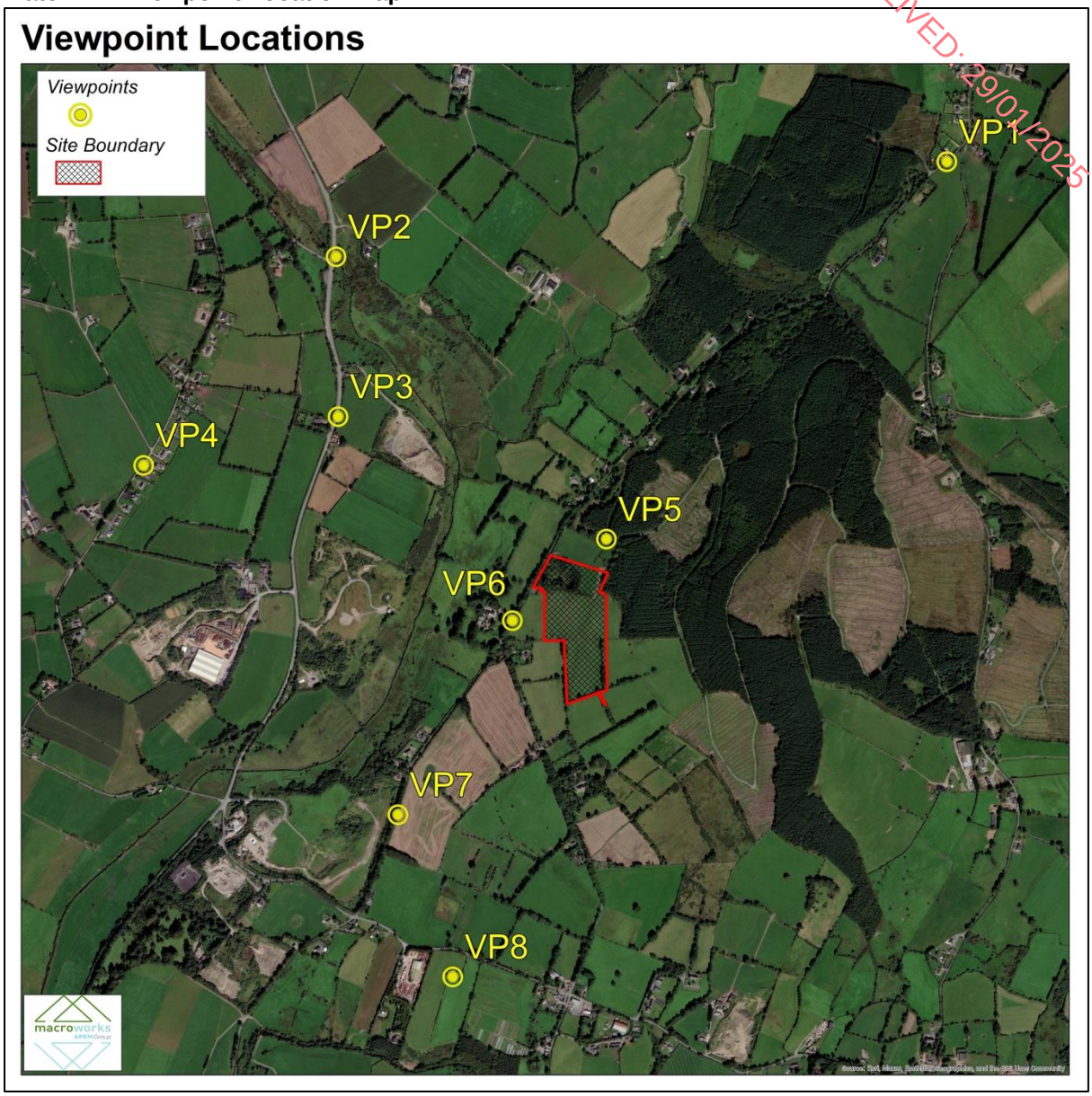
- Key Views (from features of national or international importance);
- Designated Scenic Routes and Views;
- Local Community views;
- Centres of Population;
- Major Routes; and,
- Amenity and heritage features.

VRP's might be relevant to more than one category and this makes them even more valid for inclusion in the assessment. The receptors that are intended to be represented by a particular VRP are listed at the beginning of each viewpoint appraisal. The Viewshed Reference Points selected in this instance are set out in Table 12-1 and Plate 12-4 below.

Table 12-1: Representative Viewpoints

VP No.	Location	Direction of View
VP1	Local road northeast of site at Donard Lower	SW
VP2	T-Junction on the N81 northwest of the site at Ballylion Lower	SE
VP3	N81 northwest of the site at Whitestown Lower	SE
VP4	Local road northwest of the site at Whitestown Lower	E
VP5	Fauna Loop Walk north of the Site at Deerpark	S
VP6	Local road directly west of Site at Newtown	E
VP7	Local road southwest of Site at Castleruddery Upper	NE
VP8	Castleruddery Stone Circle at Castleruddery Lower	N

Plate 12-4: Viewpoint Location Map



12.5 Characteristics and Potential Impacts of the Proposed Development

12.5.1 Proposed Development Characteristics

The Proposed Development entails the extraction of an existing area of pastoral land along the western extent of a local hill in the townland of Deerpark. The Proposed Development will consist of 3 phases and will result in the extraction of material from a maximum elevation of 220m AOD to the proposed quarry floor, which will be extracted to 165m AOD during phase 3. The Proposed Development will also encompass the construction and siting of ancillary features such as welfare facilities, a wheel wash, a weighbridge and other associated ancillary features. The Proposed Development also includes for the construction of a 3m high earthen berm along its western and southern boundary. A section of internal hedgerow that would otherwise be lost during phase 3 of the extraction will be replanted outside (east) of the extraction area at the commencement of extraction works so that it has become established by the time the final Phase 3 extraction occurs. This hedgerow and the newly formed berms will be planted with native species to further screen and soften the development from surrounding receptors. In terms of the site restoration, it is proposed to seed the quarry floor with a species-rich grass mix, whilst other biodiversity measures such as planting of areas of woodland and tree lines are also proposed.

12.5.2 Landscape Impact Assessment

First, a judgement will be made on the sensitivity of the receiving landscape, followed by an assessment of the magnitude and significance of landscape effects.

12.5.2.1 Landscape Value and Sensitivity

Landscape value and sensitivity of the Proposed Development are considered in relation to a number of factors highlighted in the Guidelines for Landscape and Visual Impact Assessment 2013, which are set out below and discussed relative to the application site and wider study area.

Landscape quality (condition)

This is a pleasant rolling landscape of transition situated on the periphery of the Wicklow Mountains. The site is contained along the west-facing slopes of a local hill that rises to a max height of 368m AOD, cloaked in a combination of pastoral lands and extensive areas of commercial conifer forestry. To the east, the terrain tends to be characterised by transitional rolling hills that merge into the Wicklow Mountains further in the distance, whilst to the west, the terrain descends towards a more typical and non-distinctive low-rolling landscape context. The landscape of the study area is typical of a transitional landscape context and comprises typical transitional land uses such as pastoral farmland and areas of commercial conifer forestry located along more elevated lands. Nonetheless, despite the foothill context of the study area, there is a strong utilitarian influence within the surrounding study area due to the varied number of anthropogenic land uses such as existing quarries, the N81 national secondary route corridor and an existing substation development. Indeed, the transitional nature of the landscape is further reflected in the current landscape assessment for County Wicklow, as the proposed development is contained across both 'the N81 (Corridor Area)' landscape character area and the 'Transitional Lands (Area of High Amenity)' landscape character area. It is important to note that the study area also contains the 'Urban Area (settlement of Donard)' landscape area in addition to the 'Baltinglass Hill (Area of High Amenity)' landscape character area, further reinforcing the study area's transitional nature.

Landscape Sensitivity Summary

Overall, this is considered a pleasant but robust landscape context that has undergone longstanding human intervention. Whilst some parts of the study area present with a typical pastoral aesthetic and afford distant views of uplands, the study area represents a robust working transitional rural landscape with values associated with rural productivity and

subsistence for the local population. Therefore, on the balance of these factors and in accordance with the criteria outlined in Appendix 12-1, the landscape sensitivity is deemed to be Medium-low, with localised areas of higher and lower sensitivity.

12.5.2.2 Magnitude and Significance of Landscape Effects

In terms of physical landscape effects, the extraction area will create a new void within the Site from an area of ca. 5.1ha from approximately 220m mAOD to a final floor level of 165m AOD. Quarrying activities generally result in long-term landscape effects; however, in most cases, these effects are reversible in nature once decommissioned. The Proposed Development will occur over three (3No.) phases and also encompasses the construction of ancillary features such as access roads, a welfare unit, weighbridge, wheel wash and other ancillary features. It is also proposed that an earthen berm be constructed along the southern and western boundary of the site, which will aid in screening the development from some of the nearest surrounding visual receptors. The proposed berm will be planted with a native woodland mix comprising whips and advanced nursery stock to further screen and soften the development from surrounding visual receptors.

In terms of the duration, the landscape impacts associated with the proposed development are considered 'permanent' as the proposed quarry void will not be filled in during the restoration phase of the development. Nonetheless, the restoration phase of the development will involve the seeding of the quarry floor with a species-rich grassland mix, whilst other restorative measures, such as planting of woodland and treelines and allowing areas of the site to revegetate naturally, will offset some of the landscape effects generated in the operational phase of the development.

The proposed new screening berms may detract slightly from the sloping pastoral/forested setting immediately south of the Proposed Development, but their presence is still considered preferable to views of the excavated faces of the extraction activity. Furthermore, once the proposed planting along these vegetated berms becomes established, both will appear more naturalistic and will visually blend into the surrounding landscape context whilst providing intended visual screening in a characteristic manner.

This is a productive rural landscape containing several other small quarries and sand pits - one of which is located less than 1km to the southwest of the Site. As a result, whilst the Proposed Development will notably intensify the extractive industry within the local landscape, it will not appear as an incongruous development type in the surrounding local landscape. Furthermore, quarry-related activities, such as the movement of heavy vehicles within, to and from the surrounding sites, are already commonplace in the local landscape context, given the influence of the extractive industry on this local landscape and the location of the busy N81 national secondary route to the west of the Site. Notwithstanding, there may be a slight increase in the frequency of heavy vehicle movements within the local road network as a result of the development.

On the basis of the factors discussed above it is considered that the magnitude of landscape impact for the Proposed Development is High-medium within the immediate vicinity, being those lands contained within approximately 500-1000m of the Proposed Development. Thereafter, the magnitude of landscape impact is deemed to reduce to Low and Negligible, as the Proposed Development becomes a progressively smaller component of the overall landscape fabric and is heavily screened from surrounding receptors, which limits its potential to notably alter the landscape character.

With reference to the significance matrix (outlined in Appendix 12-1), the High-Medium landscape sensitivity judgement attributed to the study area, coupled with a Medium-low magnitude of landscape impact in the immediate vicinity (<1000m) of the Proposed Development is considered to result in an overall significance of no greater than Moderate,

with the remainder of the 3km radius study area likely to experience Slight or Imperceptible landscape impacts.

12.5.3 Visual Impact Assessment

12.5.3.1 Sensitivity of Visual Receptors

Landscape value and sensitivity are considered in relation to several factors highlighted in the Guidelines for Landscape and Visual Impact Assessment 2013, which are set out below and discussed relative to the Proposed Development and wider study area.

This is a pleasant rolling landscape of transition situated on the periphery of the Wicklow Mountains. The site is contained along the west-facing slopes of a local hill that rises to a max height of 368m AOD, cloaked in a combination of pastoral lands and extensive areas of commercial conifer forestry. To the east, the terrain tends to be characterised by transitional rolling hills that merge into the Wicklow Mountains further in the distance, whilst to the west, the terrain descends towards a more typical and non-distinctive low-rolling landscape context. The landscape of the study area is typical of a transitional landscape context and comprises typical transitional land uses such as pastoral farmland and areas of commercial conifer forestry located along more elevated lands. Nonetheless, despite the foothill context of the study area, there is a strong utilitarian influence within the surrounding study area due to the varied number of anthropogenic land uses such as existing quarries, the N81 national secondary route corridor and an existing substation development. Indeed, the transitional nature of the landscape is further reflected in the current landscape assessment for County Wicklow, as the proposed development is contained across both 'the N81 (Corridor Area)' landscape character area and the 'Transitional Lands (Area of High Amenity)' landscape character area. It is also important to note that the study area also contains the 'Urban Area (settlement of Donard)' landscape area in addition to the 'Baltinglass Hill (Area of High Amenity)' landscape character area, further reinforcing the study area's transitional nature.

Landscape sensitivity is dealt with at a much finer scale than landscape character areas in the current Wicklow landscape strategy and combines weighting factors relating to the natural landscape and factors relevant to the social/cultural landscape in order to calculate the overall sensitivity of the landscape. Whilst all sensitivity classifications occur within the wider study area, with those of a higher sensitivity classification tending to be associated with immediate river corridors and elevated areas, the Site and its surrounding landscape have landscape sensitivity classifications ranging between Low to Medium.

Overall, this is considered a pleasant but robust landscape context that has undergone longstanding human intervention. Whilst some parts of the study area present with a typical pastoral aesthetic and afford distant views of uplands, the study area represents a robust working transitional rural landscape with values associated with rural productivity and subsistence for the local population. Therefore, on the balance of these factors and in accordance with the criteria outlined in the Table, the landscape sensitivity is deemed to be Medium-low, with localised areas of higher and lower sensitivity.

12.5.3.2 Magnitude and Significance of Visual Effects

The assessment of visual impacts at each of the selected viewpoints is aided by photomontages of the Proposed Development. Photomontages are a 'photo-real' depiction of the scheme within the view utilising a rendered three-dimensional model of the development, which has been geo-referenced to allow accurate placement and scale. For each viewpoint, the following images have been produced:

1. Existing view;
2. Extent Bar view;
3. Montage view (Phase 5); and,
4. Montage view with mitigation established.

The eight (8No.) viewpoints selected and assessed for this project are represented by photomontages that are presented in Appendix 12-2. All viewpoints are assessed below according to the methodology, baseline environment and technical criteria set out in Appendix 12-1.

Table 12-2: Viewpoints Assessment

VP NO.	Existing View	VP Sensitivity	Visual Impact Magnitude (pre & post mitigation)	Pre mitigation significance / quality / duration of impact	Post mitigation significance / quality / duration of impact
VP1	**Local road northeast of the Site at Donard Lower –** This is a heavily contained view afford from a local road that extends to the south of the settlement of Donard and is representative of the centre of population. The depicted view extends south and is contained at a near distance by the dense surrounding vegetation.	**Medium-low**	The Proposed Development will not be visible from here due to the high degree of existing intervening vegetation in the direction of the Proposed Development. Thus, the residual magnitude of the effect is deemed Negligible by default.	**Imperceptible / Neutral / Medium-term**	**Imperceptible / Neutral / Long Term**
VP2	**T-Junction on the N81 northwest of the Site at Ballylion Lower –** This is a pleasant view afforded from the N81 national secondary route at its junction with the R412 regional. This view is representative of a scenic route designation and affords a view to the east across the near River Carriggower Valley and beyond across the rolling foothill landscape. The view is contained in the distant background by Kaedeen Mountain.	**High-medium**	The Proposed Development will be visible here in alignment with the summit of Keadeen Mountain in the distance to the southeast. The Proposed Development is briefly visible and will contrast with the verdant tones and texture of the surrounding pastoral scene. Whilst the Proposed Development has the potential to draw the eye in this scene and will marginally detract from its pleasant rural qualities, it represents an intrusion of the view rather than an obstruction of any of its scenic aspects. Overall, the magnitude of visual effect is deemed Medium-low. The proposed earthen berm and native woodland planting will be subtly discernible from here, along with the replacement section of hedgerow just above the upper lip of the quarry void. This mitigation planting will have little screening effect due to the locally elevated nature of the site in this view, but it will serve to soften the view of the quarry. Nonetheless, the residual magnitude of the effect remains Medium-low.	**Moderate-slight / Negative / Medium-term**	**Moderate-slight / Negative / Long Term**
VP3	**N81 northwest of the Site at Whitestown Lower** – This is a brief view afforded from the N81 national secondary route through	**Medium**	The back face of the Proposed Development will be briefly visible from this section of the national secondary route corridor. The view represents the	**Slight / Negative / Medium-term**	**Slight / Negative / Long Term**

VP NO.	Existing View	VP Sensitivity	Visual Impact Magnitude (pre & post mitigation)	Pre mitigation significance / quality / duration of impact	Post Mitigation significance / quality /duration of impact
	an agricultural field entrance in an otherwise partially contained section of the national secondary route corridor. The depicted view is representative of the major route receptor and surrounding residential receptors and affords a view to the southeast towards the Wicklow Mountains foothills. The view is contained at a relatively short distance by a nearby hill contained in a mix of pastoral lands, mature treelined hedgerows and conifer forestry.		potential fleeting visibility road users have the potential to afford from here, where the Proposed Development void is viewed surrounding by neighbouring pastoral fields and dense areas of conifer forest. Whilst the proposed void contrasts with the other more typical rural land uses, it does not notably detract from the visual amenity of this busy roadside setting, which is otherwise partially contained by dense roadside vegetation. Indeed, the Proposed Development presents in the context of other anthropogenic land use and built features such as overhead electricity cables and recently harvested areas of conifer forest. Thus, the Proposed Development is not considered an inappropriate addition to this working transitional landscape setting. Overall, the magnitude of visual effect is deemed Low in this fleeting view. The proposed earthen berm and native woodland planting will be barely discernible from here and will have little screening effect due to the locally elevated nature of the site in this view. Thus, the residual magnitude of effect remains Low.		
VP4	**Local road northwest of the Site at Whitestown Lower –** This is a pleasant view afforded from a local road in the townland of Whitestown Lower that represents local community receptors oriented towards the site on this section of the local road. A brief view is afforded here through a residential land holding towards rolling foothill terrain. The elevated terrain in the distance is cloaked in a mix of pastoral lands and extensive conifer forest plantations.	**Medium**	The Proposed Development will be briefly visible along the sloping terrain some 1.3km west of the Site. It is important to note that residential dwellings in this linear cluster afford relatively broad panoramic views of the Wicklow Mountains foothills and beyond towards the more elevated upland parts of the Wicklow Mountains. The Proposed Development represents a very small visual envelope of the overall view afforded from this landscape context. Nonetheless, the partially visible quarry will marginally detract from this transitional setting. Although the Proposed Development represents a visual intrusion on the view and will	**Moderate-slight / Negative / Medium-term**	**Moderate-slight / Negative / Long Term**

VP NO.	Existing View	VP Sensitivity	Visual Impact Magnitude (pre & post mitigation)	Pre mitigation significance / quality / duration of impact	Post Mitigation significance / quality /duration of impact
			increase the intensity of development in the surrounding landscape context, the Proposed Development does not block the more sensitive viewing aspect towards the elevated uplands. Overall, the magnitude of the effect is deemed Medium-low. The proposed earthen berm and native woodland planting will be subtly discernible from here, along with the replacement section of hedgerow just above the upper lip of the quarry void. This mitigation planting will have little screening effect due to the locally elevated nature of the site in this view, but it will serve to soften the view of the quarry. Thus, the residual magnitude of the effect remains Medium-Low.		
VP5	**Fauna Loop Walk north of the Site at Deerpark** – This is a view afforded from a looped walking trail along the forestry tracks in the conifer forest to the north of the site. The trail is heavily contained by dense woodland, with little open visibility of the surrounding lands. Indeed, dense vegetation along the verge of the forest tracks contains the depicted view at an almost immediate distance.	**Medium**	The Proposed Development will not be visible from here due to the high degree of existing intervening vegetation in the direction of the Proposed Development. Thus, the residual magnitude of the effect is deemed Negligible by default.	**Imperceptible / Neutral / Medium-term**	**Imperceptible / Neutral / Long Term**
VP6	**Local road directly west of the Site at Newtown –** This is a heavily contained view afforded from a local road in the townland of Newtown that represents local community receptors. A brief glimpse uphill towards the neighbouring pastoral lands is afforded through the nearby agricultural gateway on the eastern verge of the local road corridor, where the view is contained	**Medium-low**	Only the proposed earthen berm will be visible from the near distance uphill from the local road corridor at a distance of ca. 100m. While the engineered berm contrasts with the more natural sloping landform and generates a slightly increased sense of enclosure, it will have little effect on the visual amenity of this scene, where it is only briefly visible through the neighbouring agricultural field entrance. Furthermore, there will be almost no visibility of the development from the	**Slight-imperceptible / Neutral / Medium-term**	**Slight-imperceptible / Neutral / Medium-term**

VP NO.	Existing View	VP Sensitivity	Visual Impact Magnitude (pre & post mitigation)	Pre mitigation significance / quality / duration of impact	Post Mitigation significance / quality /duration of impact
	shortly thereafter by sloping terrain and a dense conifer forest.		adjacent residential land holding, which is contained by further layers of mature vegetation. Thus, the magnitude of the effect is deemed Low-negligible. Once fully established, the proposed native woodland mix planted across the berm will have a much softer appearance than the engineered earthen berms. Nonetheless, the proposed native woodland mix will also generate a further sense of enclosure, screening the view of the nearby elevated forest. Nevertheless, the residual visual effect remains Low-negligible.		
VP7	**Local road southwest of the Site at Castleruddery Upper -** This is a pleasant pastoral view afforded from an agricultural field entrance along a local road in the townland of Castleruddery. The depicted view is representative of local community receptors along this section of the local road and extends across sloping terrain cloaked in pastoral farmland and intervening vegetation and is contained in the background by a low hill cloaked in conifer forest.	**Medium**	Brief and intermittent visibility of the Proposed Development has the potential to be afforded from this gateway view, where the development is partially screened and softened by the layers of intervening mature treelined hedgerows. The Proposed Development is viewed backed by the sloping terrain along the hillside, which limits the perceived modification of the landform from here. Indeed, the surrounding intervening vegetation that partially screens the Site also diminishes the overall scale and extent of the development from this viewing context. Whilst the Proposed Development will marginally detract from the pastoral aesthetic in this view, it will not appear incongruous as brief intermittent views of a neighbouring sand and gravel development (substantially restored) also have the potential to be afforded to the east of this local road. Overall, the magnitude of effect is deemed Low. Once fully established, the proposed native woodland planting along the earthen berm surrounding the southern and western boundary of the site will further screen and soften the Proposed Development, where it presents between the existing layers of vegetation.	**Slight / Negative / Medium-term**	**Slight-imperceptible / Negative / Medium-term**

VP NO.	Existing View	VP Sensitivity	Visual Impact Magnitude (pre & post mitigation)	Pre mitigation significance / quality / duration of impact	Post Mitigation significance / quality /duration of impact
			Thus, the residual magnitude of visual effect will reduce to Low-negligible once the proposed mitigation screen planting has fully established.		
VP8	**Castleruddery Stone Circle at Castleruddery Lower –** This is a partially contained view that is representative of the Castleruddery Stone Circle located in the townland of Castleruddery Lower. This view is contained at a near distance to the north by surrounding nearby vegetation, with some brief visibility afforded of the conifer-clad hill to the north.	**High-medium**	The Proposed Development will not be visible from here due to the high degree of existing intervening vegetation in the direction of the Proposed Development. Thus, the residual magnitude of effect is deemed Negligible by default.	**Imperceptible / Neutral / Medium-term**	**Imperceptible / Neutral / Long Term**

12.6 Proposed Mitigation Measures

The main mitigation by avoidance measure is the siting of the Proposed Development in a contained landscape context that avails of a high degree of existing screening in the form of existing hedgerow vegetation and surrounding mature treelines. The Proposed Development is also contained in a landscape context already influenced by the extractive industry, which limits its potential to present as an incongruous development type.

It is proposed to construct a ca. 3m height berm along the western and southern Site boundary. This earthen berm will be planted with a native woodland mix provided in the form of high canopy (dominants) species, low canopy (sub-dominant) species, understory and fringe (higher shrubs) species and understory and edge (lower shrub) species and will comprise of a mix of advanced nursery stock and whip planting of local provenance. The proposed planting will be allowed to grow out to reach maturity and will soften and screen the surrounding landscape and visual receptors as it matures.

Other landscape and visual mitigation measures relate to the retention of existing vegetation surrounding the Site to retain the existing landscape structure and screening in the immediate Site vicinity.

12.7 Cumulative and In-Combination Effects

The main cumulative effect in this instance is related to the existing quarries and sand and gravel pits within the surrounding study area, which have been mentioned throughout the assessment above. The in-combination effects of the existing extractive industry developments within the study area and the Proposed Development have already been undertaken with respect to both landscape effects and visual effects (see above section). Separate consideration of cumulative effects is, therefore, not considered necessary in this instance as there are no other relevant proposed or in-planning developments within the study area.

Overall, the cumulative landscape and visual impact of the Proposed Development is not considered to be significant.

12.8 Interactions with other Environmental Attributes

None identified.

12.9 Indirect Effects

The principal indirect effect of the Proposed Development generated during the operational phase of the development would be the increased movement of heavy goods vehicles along the surrounding local and national roads, carrying the excavated materials to and from the Site. This would generate an increase in the intensity of HGV traffic in the locality and would slightly detract from the sense of rural tranquillity in the immediate vicinity of the Site. Nonetheless, quarry-related traffic is already a feature of this landscape area due to the existing quarries located in the nearby surroundings, and thus, this will intensify an existing indirect effect rather than add a new and unfamiliar one. There will be no other notable indirect effects generated at the surrounding landscape and visual amenities as a result of the Proposed Development.

12.10 Residual Effects

Based on the landscape and visual impact judgements provided throughout this LVIA, the Proposed Development is not considered to give rise to any significant residual effects.

12.11 Monitoring

Ongoing monitoring of effects or mitigation measures is not considered necessary in this instance.

12.12 Difficulties Encountered

There we no difficulties encountered in the process of completing the LVIA.

13 CULTURAL HERITAGE

13.1 Introduction

This Chapter of the EIAR, commissioned by MOR Environmental on behalf of the Applicant, addresses the impacts on the archaeological, architectural, and cultural heritage of the Proposed Development, and the surrounding area, of a proposal to develop a quarry in Deerpark townland, Co. Wicklow.

13.2 Methodology

This study complies with the requirements of Directive EIA 2014/52/EU. The chapter is an assessment of the known or potential cultural heritage resource within a specified area and includes the information that may reasonably be required for reaching a reasoned conclusion on the significant effects of the project on the environment, taking into account current knowledge and methods of assessment. It consists of a collation of existing written and graphic information in order to identify the likely context, character, significance and sensitivity of the known or potential cultural heritage, including architectural and archaeological aspects using an appropriate methodology (EPA 2002, 2003 and 2022). It consists of the following study stages:

- Baseline Studies; and,
- Assessment of the Proposed Development area.

The criteria and definitions for describing effects are as in section 1.8 above.

13.2.1 Baseline Study

The baseline study research has been undertaken in two phases: the paper study phase and subsequently the field inspection phase.

13.2.1.1 Paper Study

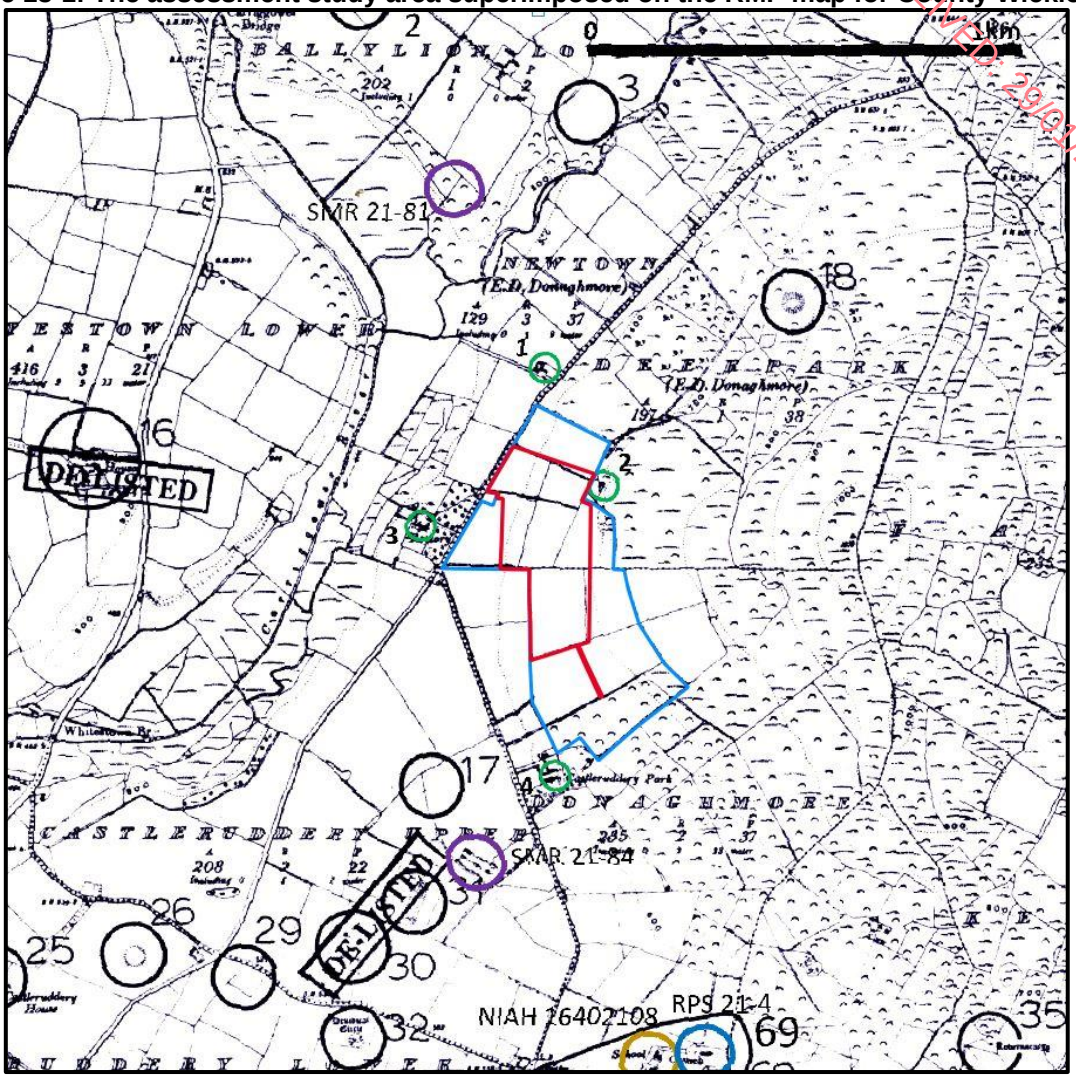
The first phase comprised a paper survey of all available archaeological, historical and cartographic sources. This involved the following:

- A collation of existing written and graphical information to identify the likely context, character, significance and sensitivity of the known or potential cultural heritage, archaeological and structural resource using appropriate methodology;
- A detailed investigation of the archaeological and historical background of the Site, the landholding and the surrounding area extending 1km from the Site boundary (Figure 13-1). This area was examined using information from the:
    - Record of Monuments and Places (‘RMP’) of County Wicklow;
    - The Sites and Monuments Record;
    - The Wicklow County Development Plan 2022-2028;
    - The National Inventory of Architectural Heritage;
    - Aerial photographs;
    - Excavation reports;
    - Cartographic; and,
    - Documentary sources.
- The CDP is the statutory plan detailing the development objectives/policies of the relevant local authority. The plan includes objectives and policies, relevant to this assessment, i.e. regarding cultural heritage;

- The National Inventory of Architectural Heritage ('NIAH') - is a state initiative under the administration of the Department of Culture, Heritage and the Gaeltacht and established on a statutory basis under the provisions of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999. The purpose of the NIAH is to identify, record, and evaluate the post-1700 architectural heritage of Ireland, uniformly and consistently as an aid in the protection and conservation of the built heritage. NIAH surveys provide the basis for the recommendations of the Minister for Culture, Heritage and the Gaeltacht to the planning authorities for the inclusion of structures in their Record of Protected Structures ('RPS');
- The Record of Monuments and Places - was established under section 12 (1) of the National Monuments (Amendment) Act, 1994 and provides that the Minister shall establish and maintain a record of monuments and places where the Minister believes there are monuments, such record to be comprised of a list of monuments and relevant places and a map or maps showing each monument and relevant place in respect of each county in the State. The associated files contain information of documentary sources and field inspections where these have taken place;
- The Sites and Monuments Record - is maintained by the Department of Housing, Local Government and Heritage and contains information on Recorded Monuments and additional unprotected sites that have been identified since the Record of Monuments was issued;
- Aerial photographs – record cropmarks, soil marks and earthworks that may have not been previously detected;
- Cartographic Sources - this includes seventeenth-century mapping as well as the 1st and 2nd editions of the Ordnance Survey six-inch maps; and,
- Documentary Sources – provide more general historical and archaeological background.

The second phase involved a field inspection and assessment of the Proposed Development area.

Figure 13-1: The assessment study area superimposed on the RMP map for County Wicklow.



13.2.1.2 Field Inspection

A field inspection was carried out on the 21st July 2023 to identify and assess any known archaeological sites and previously unrecorded features and portable finds within the application area.

A geophysical survey of the application area was conducted by AMS in October 2024 (NMS Licence No. 24R0466).

13.2.1.3 Assessment of the Proposed Development

An impact assessment and mitigation strategy have been prepared. An impact assessment is undertaken to outline potential adverse impacts that the Proposed Development may have on the cultural resource, while a mitigation strategy is designed to avoid, reduce or offset such adverse impacts.

Extracts from the Record of Monuments and Places for County Wicklow are presented on a map of the local area around the Site in Figure 13-1. RMP sites included on the Records of Monuments and Places statutory mapping are identified by black circles. The Proposed Development is shown with a red line.

13.2.1.4 Guidelines

The report format and the descriptions of effects are based on the Guidelines on the Information to be contained in Environmental Impact Assessment Report, published by the Environmental Protection Agency ('EPA') in May 2022.

13.3 Receiving Environment

13.3.1 The Landscape

The Proposed Development is located in the townland of Deerpark, Co. Wicklow, on OS Six Inch sheet No. 21, ca. 2.1km to the southwest of the village of Donard and 0.8km east of the N81 road. The local soil is a Clonroche series of fine loamy drift with Siliceous stones overlying drift with siliceous stones . The lands are currently in use for pastoral agriculture.

13.3.2 Historical and Archaeological Background

The following is a summary of the archaeological and historical development of the study area and the main types of sites, monuments and structures that are known from the surrounding area. The purpose of this approach is to place the types of sites, monuments, and structures in the study area in a cultural and chronological context to assist the assessment. The Proposed Development is situated in the townland of Deerpark, in the civil parish of Donaghmore and the barony of Talbotstown Upper. Note the original spellings of placenames recorded in the source material are retained in the text.

13.3.2.1 The Prehistoric Period

There are three monuments in the study area listed in the Record of Monuments as Cairn – unclassified (RMP WI021-017001-, WI021-017002- and WI021-017003-) that may be the remains of prehistoric cairns or stone circles. The significant Bronze Age Castlederry Lower embanked stone circle (RMP WI021-032----) is also located ca. 0.96km to the southwest of the Proposed Development.

13.3.2.2 The Early Medieval Period

In the Early Medieval period, the study area was situated in the kingdom of Iarthar Liphi, later known as Uí Muiredaig, which was ruled by the Uí Muiredaig sept . Classically settlement at this period is indicated by the presence of enclosed farmsteads known as ringforts, when enclosed with earthen banks, and cashels when enclosed by stone walls. There is a ringfort in the study area in Deerpark townland (RMP WI021-017003-) and circular enclosures in Ballylion Lower (RMP WI021-003----) and Castleruddery Lower (RMP WI021-026---- and WI021-029)---- that may be the remains of ringforts. An Early Medieval ogham stone (now in Donard) was originally from Ballylion townland (SMR WI021-081----).

13.3.2.3 The Medieval Period

On the death of King Diarmait Mac Murchade in 1171 the Earl of Pembroke inherited the Kingdom (now the Lordship) of Leinster. At de Clare's death in 1176, the process of sub-infeudation, the granting of lands by lords to their dependents to be held by feudal tenure, was well underway. The lands of the Uí Muireadaigh sept in south Kildare had been granted to Walter de Riddlesford, and that sept was forced eastward across the River Greese into the study area. Here they became known as the O'Tuathal and eventually the O'Tooles and were called the lords of Hy-Mail.

The process of sub-infeudation is normally associated with the constriction of an earth and timber castle, known as Motte. The construction and use of these fortifications dated from the arrival of the Normans (Hugh de Lacy was killed while supervising the construction of Motte at Durrow in 1186) until, at last, the second decade of the thirteenth century. Other characteristic feudal earthworks are moated sites, rectangular earthworks that enclosed manor houses, ringworks, circular defended areas, and, finally, masonry castles. There are

no motte castles, or ringworks and no masonry castles in the study area, although there is a Motte just to the south in Castleruddery Lower townland (RMP WI021-033----). A rectangular enclosure indicated on the 1st edition OS mapping in Ballylion Lower townland, now levelled, could potentially be the remains of a moated site. A church at Donaghmore (RMP WI021-069001-) is mentioned in the twelfth century and formed part of the diocesan lands of Glendalough that may have been part of a borough.

13.3.2.4 The Post-Medieval Period

The fifteenth century was characterised by the decline of Anglo-Norman power in Ireland which had been ebbing since the early fourteenth century. Part of the response to this was the construction of masonry tower houses. A Castle, possible, site' in Castleruddery Lower (RMP WI021-025----) could have been a Tower House. The Down Survey records that in 1641 Deerpark townland was held by Sir Robert Talbot, Baron Talbot of Carton, and he retained it in 1670 (downsurevy.tcd.ie). Griffiths Primary valuation of Ireland 1847-64 records that in the mid-nineteenth century, the Proposed Development was held by the Earl of Wicklow, William Howard, who was the Lord Lieutenant of Wicklow 1831-69, and was leased to John Finton and Charles Connor (http://www.askaboutireland.ie/griffith-valuation).

13.3.3 Wicklow County Development Plan 2022-28

Chapter 8 of the CDP sets out the policies and objectives on built heritage within the County.

13.3.3.1 Built Heritage

There are several objectives outlined in Section 8.5 of the plan in respect to Built Heritage which state:

Archaeology Objectives

CPO 8.1 To secure the preservation of all archaeological monuments included in the Record of Monuments and Places as established under Section 12 of the National Monuments (Amendment) Act, 1994, and of sites, features and objects of archaeological interest generally. In the development management process, there will be a presumption of favour of preservation in-situ or, as a minimum, preservation by record. In securing such preservation, the Planning Authority will have regard to the advice and recommendations of the National Monuments Service of the Department of Housing, Local Government and Heritage.

CPO 8.2 No development in the vicinity of a feature included in the Record of Monuments & Places ('RMP') or any other site of archaeological interest will be permitted which seriously detracts from the setting of the feature or which is seriously injurious to its cultural or educational value.

CPO 8.3 Any development that may, due to its size, location or nature, have implications for archaeological heritage (including both sites and areas of archaeological potential/significance as identified in Schedules 08.01 & 08.02 and Maps 8.01 & 8.02 of this plan) shall be subject to an archaeological assessment.

CPO 8.4 To require archaeological assessment for all developments with the potential to impact on the archaeological heritage of riverine, intertidal or sub-tidal environments.

CPO 8.5 To facilitate new or improved public access to and erection of appropriate interpretive signage at National Monuments, archaeological sites, castles, sites of historic interest and archaeological landscapes in State or private ownership, as identified in Schedule 08.02 and Map 8.02 of this plan, in co-operation with landowners.

CPO 8.6 To protect the integrity of Baltinglass Hills archaeological landscape, including identified monuments and their wider setting by resisting development that may adversely impact upon the significance and understanding of this important landscape.

CPO 8.7 To support the inscription of Glendalough to Ireland's tentative UNESCO World Heritage Site list and promote a conservation-led approach to facilitating visitor access and enjoyment of this internationally significant landscape.

CPO 8.8 To protect and promote the characteristics of historic towns in County Wicklow identified as zones of archaeological potential in the Record of Monuments and Places ('RMP'), ensuring that cognisance is given in relevant development proposals to retaining existing street layout, historic building lines and traditional plot widths where these derive from medieval or earlier origins.

CPO 8.9 To protect and promote the conservation of historic burial grounds (those that are generally no longer in use, but which may contain sites and features on the Record of Monuments and Places ('RMP') and/or RPS and support greater public access to these where possible.

Architectural Heritage Objectives

CPO 8.10 To protect, conserve and manage the built heritage of Wicklow and to encourage sensitive and sustainable development to ensure its preservation for future generations.

CPO 8.11 To support the work of the National Inventory of Architectural Heritage (NIAH) in collecting data relating to the architectural heritage, including the historic gardens and designed landscapes of the County, and in the making of this information widely accessible to the public and property owners.

CPO 8.12 To have regard to '*Architectural Heritage Protection: Guidelines for Planning Authorities'* (Department of Arts, Heritage and the Gaeltacht, 2011) in the assessment of proposals affecting architectural heritage.

Record of Protected Structures Objectives

CPO 8.13 To ensure the protection of all structures, items and features contained in the Record of Protected Structures.

CPO 8.14 To positively consider proposals to alter or change the use of protected structures so as to render them viable for modern use, subject to architectural heritage assessment and to demonstrate by a suitably qualified Conservation Architect / or other relevant expertise that the structure, character, appearance and setting will not be adversely affected and suitable design, materials and construction methods will be utilised.

CPO 8.15 All development works on or at the sites of protected structures, including any site works necessary, shall be carried out using best heritage practices for the protection and preservation of those aspects or features of the structures/site that render it worthy of protection.

CPO 8.16 To support the re-introduction of traditional features on protected structures where there is evidence that such features (e.g. window styles, finishes etc) previously existed.

CPO 8.17 To strongly resist the demolition of protected structures or features of special interest unless it can be demonstrated that exceptional circumstances exist. All such cases will be subject to full heritage impact assessment and mitigation.

Other Structures & Vernacular Architecture Objectives

CPO 8.18 To seek (through the development management process) the retention, conservation, appropriate repair and reuse of vernacular buildings and features such as traditional dwellings and outbuildings, historic shopfronts, thatched roofs and historic features such as stonewalls and milestones. The demolition of vernacular buildings will be discouraged.

CPO 8.19 Development proposals affecting vernacular buildings and structures will be required to submit a detailed, true measured survey, photographic records and written analysis as part of the planning application process.

CPO 8.20 Where an item or a structure (or any feature of a structure) is considered to be of heritage merit (where not identified in the RPS3), the Planning Authority reserves the right to refuse permission to remove or alter that structure/item, in the interests of the protection of the County's architectural heritage.

Architectural Conservation Area Objectives

CPO 8.21 Within Architectural Conservation Areas, all those buildings, spaces, archaeological sites, trees, street furniture, views and other aspects of the environment which form an essential part of their character, as set out in their character appraisals, shall be considered for protection. The repair and refurbishment of existing buildings within the ACA will be favoured over demolition/new build in so far as practicable.

CPO 8.22 The design of any development in Architectural Conservation Areas, including any changes of use of an existing building, should preserve and/or enhance the character and appearance of the Architectural Conservation Area as a whole. Schemes for the conservation and enhancement of the character and appearance of Architectural Conservation Areas will be promoted. In consideration of applications for new buildings, alterations and extensions affecting Architectural Conservation Areas, the following principles will apply:

- Proposals will only be considered where they positively enhance the character of the ACA;
- The siting of new buildings should, where appropriate, retain the existing street building line;
- The mass of the new building should be in scale and harmony with the adjoining buildings and the area as a whole, and the proportions of its parts should relate to each other and to the adjoining buildings;
- Architectural details on buildings of high architectural value should be retained wherever possible. Original features which are important to a building's character, such as window type, materials, detailing, chimneys, entrances and boundary walls, both within and outside the architectural conservation area, should be retained where possible. A high standard of shopfront design relating sympathetically to the character of the building and the surrounding area will be required. The materials used should be appropriate to the character of the area. Planning applications in Architectural Conservation Areas ('ACAs') should be in the form of detailed proposals, incorporating full elevational treatment and colours and materials to be used; and,
- Where modern architecture is proposed within an Architectural Conservation Area ('ACA'), the application should provide details (drawings and/or written detail) on how the proposal contributes to or does not detract from, the attributes of the ACA.

CPO 8.23 To consider the designation of further ACAs for towns and villages in County Wicklow when preparing future local plans and as deemed appropriate.

CPO 8.24 To establish, where it is considered appropriate, "Areas of Special Planning Control" if it is considered that all or part of an Architectural Conservation Area is of special importance

to the civic life or the architectural, historical, cultural, or social character of a town or village in which it is situated.

Historical & Cultural Heritage Objectives

CPO 8.25 To protect and facilitate the conservation of structures, sites and objects which are part of the County's distinct local historical and cultural heritage, whether or not such structures, sites and objects are included on the RPS.

CPO 8.26 To facilitate access to and appreciation of areas of historical and cultural heritage through the development of appropriate trails and heritage interpretation in association with local stakeholders and site landowners, having regard to the public safety issues associated with such sites.

CPO 8.27 To facilitate future community initiatives to increase access to and appreciation of railway heritage, through preserving the routes of former lines free from development.

CPO 8.28 Any road or bridge improvement works along the Military Road shall be designed and constructed with due regard to the history and notable features of the road (in particular its original support structures, route and alignment), insofar as is possible and reasonable given the existing transport function of the road.

13.3.4 Buildings

13.3.4.1 Designated Structures

The Record of Protected Structures in the CDP was reviewed as part of the baseline study for this chapter. The review established that there are no structures within the Proposed Development listed in the Record of Protected Structures. There is one structure in the study area listed in the Records of Protected Structures (see Table 13-1). This structure is located ca. 0.99km south of the Proposed Development and is considered to be too far distant to be directly or indirectly impacted by the proposal.

Table 13-1: NIAH structures in the vicinity of the Proposed Development

No.	Church
Structure type	Church
Townland	Donaghmore
Designation	RPS
Data source	Wicklow Co. Development Plan
Perceived Significance:	Regional
Type of impact:	None.
Significance & quality of impact	None

No.	Church
Description	Detached two-bay single-storey Church of Ireland church, built in 1711, with three-stage tower added in 1821 and chancel in 1875. To the north, there is a small, hipped roof vestry projection and some smaller lean-to projections. The walls are finished in a combination of roughcast and lined render, with granite surrounds to the openings and granite string courses to the tower, whilst the pitched roofs of the nave and chancel are slated and have stone parapets. The roofs of the projections to the north are also slated but the roof of the tower is hidden by a crenelated parapet with tall granite corner pinnacles. The entrance is to the north face of the tower and consists of a pointed arch-headed timber door. The windows are a mixture of segmental, pointed and semi-circular arch-headed with most filled with stained glass. Replacement of metal rainwater goods. The church is surrounded by a small graveyard enclosed by a rubble wall with wrought-iron gates to the west with square piers.

13.3.4.2 Structures National Inventory of Architectural Heritage

The National Inventory of Architectural Heritage ('NIAH'), which is maintained by the Dept. of Housing, Local Government and Heritage, was examined as part of the baseline study for this section of the EIAR on the 20th June 2023. The review established that there are no structures within the Proposed Development listed in the NIAH. There is one structure in the study area listed in the NIAH (Table 13-2). This structure is located ca. 0.96km south of the Proposed Development and is considered to be too far distant to be directly or indirectly impacted by the proposal.

Table 13-2: Structures within the vicinity of the Proposed Development.

No. 16402108	School
Structure type	School
Townland	Donaghmore
Designation	-
Data source	NIAH
Perceived Significance:	Regional
Type of impact:	None.
Significance & quality of impact	None
Description	The detached three-bay single-storey former schoolhouse, built in 1821 and is now in use as a parish hall. The building is roughly a backward 'C' shape in plan, with two projections to the rear both merging with small lean-to sections. The walls are finished in a replacement roughcast render with a plain render base course, whilst the hipped roof is slated and has plain ridge tiles. The entrance consists of a replacement timber door set (off-centre) within a large segmental-headed recess, which also includes a small granite date stone. The flat-headed windows have replacement top-hung timber frames. Replacement of metal rainwater goods. The building is set on the side of the lane leading to the nearby Church of Ireland church.

13.3.4.3 Field Inspection

On the 21st July 2023 fieldwork was carried out to identify any additional unlisted upstanding structures in the vicinity of the application area. This involved assessing all upstanding structures that are marked on the 1910 edition of the six-inch Ordnance Survey mapping within 300m of the application area (see Table 13-3 and Figure 13-1). There are five such structures in this area (see below). Structures Nos. 1 and 2 have no special architectural interest.

Structure No. 3, the former Rectory, has some local special architectural interest due to its design and features. The setting of this structure could potentially be subject to a worst-case, negative, significant and long-term effect while the quarry is in operation if mitigation was not implemented. Structure No. 4 is located on a private gated drive and is not visible from the road.

Table 13-3: Structures in the vicinity of the Proposed Development.

No.1	**House**
Structure type	House
Townland	Newtown
Designation	None
Data source	1910 edition of the six-inch Ordnance Survey map
Perceived Significance	None
Type of impact:	None
Significance & quality of impact	None
Description	Detached three-bay two-storey stone house, slated roof, single chimneystack. No special architectural interest.
Plate	Plate 13-1

Plate 13-1: Structure 1 looking northwest

Table 13-4: Structures in the vicinity of the Proposed Development

No.2	**House**
Structure type	House
Townland	Deerpark
Designation	None
Data source	1910 edition of the six-inch Ordnance Survey map
Perceived Significance:	None
Type of impact:	None
Significance & quality of impact	None
Description	Mostly ruined stone house, with remains of the lower part of the walls only. Now in forestry. No special architectural interest.
Plate	Plate 13-2

Plate 13-2:Structure 2 looking north.

Table 13-5: Structures in the vicinity of the Proposed Development

No.3	**Rectory**
Structure type	House
Townland	Newtown
Designation	None
Data source	1910 edition of the six-inch Ordnance Survey map
Perceived Significance:	Local

No.3	Rectory
Type of impact:	Worst case
Significance & quality of impact	Negative, significant
Description	Detached five-bay two-storey stone house, the front door has a radial fanlight over and is set within a semi-circular arched opening; dressed with a Gibbs surround. The window openings are flat-headed with six over six timber sash frames. Hipped slated roof, single chimneystack. Some special architectural interest.
Plate	Plate 13-3

Plate 13-3:View of structure 3 looking north

Table 13-6: Structures in the vicinity of the Proposed Development

No.4	House
Structure type	House
Townland	Donaghmore
Designation	None
Data source	1910 edition of the six-inch Ordnance Survey map
Perceived Significance:	None
Type of impact:	None
Significance & quality of impact	None
Description	House located on a private gated drive and is not visible from the road.
Plate	-

13.3.5 Archaeological Assessment

13.3.5.1 Recorded Monuments

Examination of the Record of Monuments and Places for Co. Wicklow indicated that there are no Recorded Monument in the Proposed Development (Figure 13-1).

The closest Recorded Monument externally to the Proposed Development is WI021-018---- (see Appendix 13-1). This is described in the Record of Monuments as:

> *'WI021-018---- Deerpark Ringfort - rath*
>
> *Situated on a gentle S/SE-facing terrace at a break in a marked slope in forestry. Circular area (diam. 28m; max. ext. diam. 41m) defined by an earthen bank (Wth 2-3.5m; H 0.2m-1.8m) and an external flat-bottomed fosse (Wth 3.5m; D 1-1.3m). There is a counterscarp bank (max. Wth 3m; max. ext. H 1.2m) SE-W-NE. The entrance (Wth 2m) consists of gaps in both banks and a causeway across the fosse at the W; three other gaps in the inner bank appear to be modern. There is a narrow fosse (max. Wth 1.8m; D 0.4m) inside the bank in the E quadrant. Inside this is another bank (Wth 3m; H 0.4m) attached to the fort bank at the SE and NE and curving inwards. It has a centrally placed gap (Wth 2m) and its purpose and date are unknown. No other internal features.'*

This monument is located ca. 540m north-west of the Proposed Development. The monument will not be directly or indirectly impacted by the Proposed Development.

The remaining Recorded Monuments listed in the study area are all considered to be too far distant to be directly or indirectly impacted by the proposal.

13.3.5.2 The Sites and Monuments Record

Examination of the Sites and Monuments Record ('SMR') which is maintained by the Dept. of Housing, Local Government and Heritage on the 21st June 2023 indicated that there are no SMRs in the Proposed Development. The closest SMR externally to the Proposed Development is WI021-084---- (see Appendix 13-2). This SMR is described in the SMR as:

> *'WI021-084 Castleruddery Upper Designed landscape feature*
>
> *On level ground in a marshy area at the foot of a steep W-facing slope with higher ground on all sides. A rectangular feature defined by a wide bank (Wth 10m) with an external fosse at the NW end. Internally there are 6 pits in two rows of three, each joined to the next by a ditch. Another designed landscape feature (WI021-031----) lies ca. 100m to the SW.'*

This is ca. 480m southwest of the Proposed Development. This is considered to be too far distant to de directly or indirectly impacted by the proposal.

The remaining SMR listed in the study area is considered to be too far distant to be directly or indirectly impacted by the proposal.

13.3.5.3 Cartographic Sources

The Ordnance Survey 1st and 3rd edition six-inch maps and the first edition 25-inch maps of the area were examined (Figures 13-2 and Figure 13-3). There are two structures indicated on the 1st six-inch map. These structures have been levelled since the late nineteenth century, they are not indicated on the 1st edition twenty-five-inch map and are no longer visible at ground level. There are no other archaeological, structural, or cultural heritage features indicated in the Proposed Development.

Figure 13-2: Application Site outlined in red, superimposed on the OS 1st edition six-inch map.

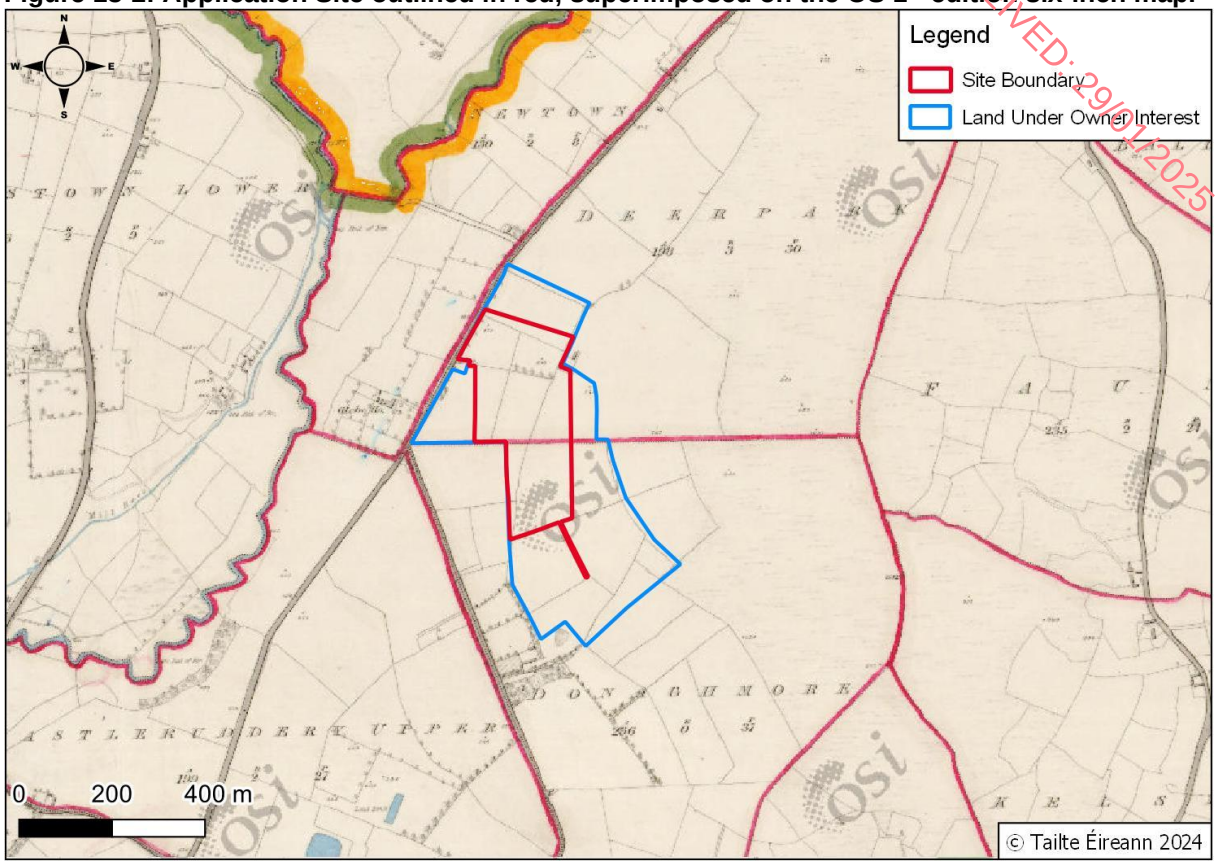
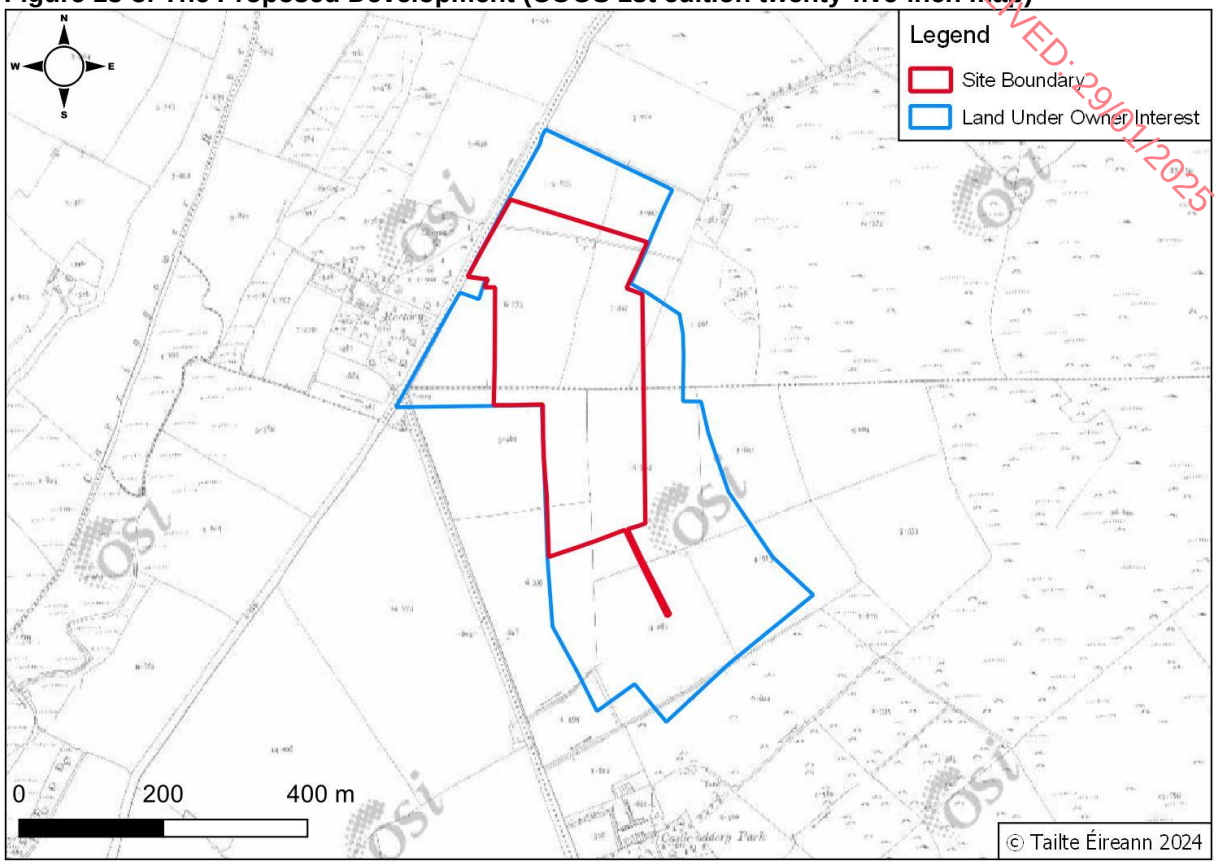


Figure 13-3: The Proposed Development (COOS 1st edition twenty-five-inch map)



13.3.5.4 Place name evidence.

The place names were extracted from the cartography in order to facilitate the search for structures and monuments and small finds, to help identify any unrecorded monuments or structures, to search for any published papers and documents related to the study area and to assist in the study of the historical development of the area. The place names were looked up in the Placenames Database of Ireland at Logainm.ie (Table 13-7) . The placenames refer primarily to topographical features and landcover. The placenames do not indicate any additional heritage sites within the Proposed Development.

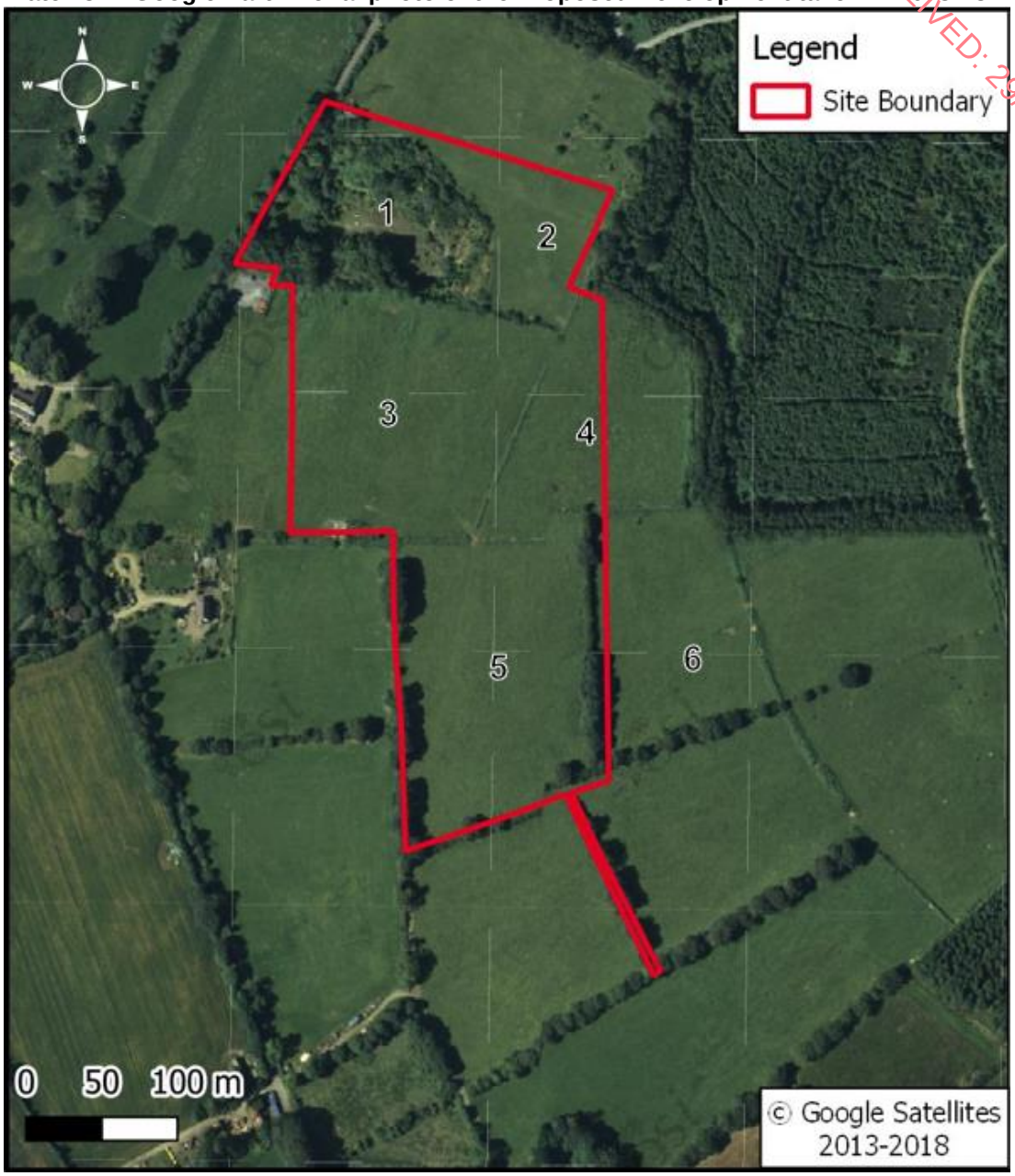
Table 13-7: Townland names in the study area

Townland name	Translation
Ballylion Lower	Lyon's town
Castleruddery Upper	Knight's castle
Deerpark	Deer park
Donaghmore	Great church
Donard Lower	High fort lower
Donard Mountain	High fort mountain
Fauna	A slope, or declivity
Newtown	Anglicised
Whitestown	White's town

13.3.5.5 Aerial Photography

Online Ordnance Survey aerial photography taken in 1995, 1999-2000, 2004-2005, 2005-6, and 2013-14, Google Earth imagery from 2003, 2010, 2011, 2013, 2015, 2016, 2017, 2018, 2019, 2020, 2021, and 2022, and Microsoft Bing imagery from 2011 were reviewed. No archaeological, structural, or cultural heritage features are visible in the imagery (Plate 13-4).

Plate 13-4: Google Earth Aerial photo of the Proposed Development taken in 2013-18.



Other Sources

Examination of archaeological corpus works on prehistoric artefacts did not reveal any additional material from the study area.

13.3.5.6 Archaeological investigations

Examination of the Excavations Bulletin at Excavations.ie indicated that there have been no licensed excavations carried out in the Proposed Development or the study area .

13.3.6 Field Inspection

A field inspection was carried out on the 21st July 2023. This involved an inspection of all the lands in the Proposed Development (Figure 13-1 and Plate 13-4), along with accessible field to the east of the Site.

13.3.6.1 Area 1

Area 1 is the existing quarry that has already been extracted (Plate 13-5). There is no visible indication of any archaeological, architectural, or cultural heritage material at ground level.

Plate 13-5: Panoramic view of Area 1 looking east

13.3.6.2 Area 2

Area 2 is the south-eastern part of the field in which the existing quarry is located. It is steeply west-sloping pasture enclosed by drystone walls and the overgrown bank of the existing quarry (Plate 13-6). There is no visible indication of any archaeological, architectural, or cultural heritage material at ground level.

Plate 13-6: View of Area 2 looking southwest

13.3.6.3 Area 3

Area 3 is a large rectilinear-shaped field of steeply west-sloping pasture enclosed by drystone walls (Plate 13-7). There is no visible indication of any archaeological, architectural or cultural heritage material at ground level.

Plate 13-7: Panoramic view of Area 3 looking northwest

13.3.6.4 Area 4

Area 4 is a cone-shaped field of steeply west-sloping pasture, enclosed by drystone walls (Plate 13-8). There is no visible indication of any archaeological, architectural, or cultural heritage material at ground level.

Plate 13-8: Panoramic view of Area 4 looking south

13.3.6.5 Area 5

Area 5 is a large rectilinear-shaped field of steeply west-sloping pasture, enclosed by drystone walls with hedgerow and mature trees (Plate 13-9). There is no visible indication of any archaeological, architectural, or cultural heritage material at ground level.

Plate 13-9: Panoramic view of Area 5 looking southwest.

13.3.6.6 Area 6

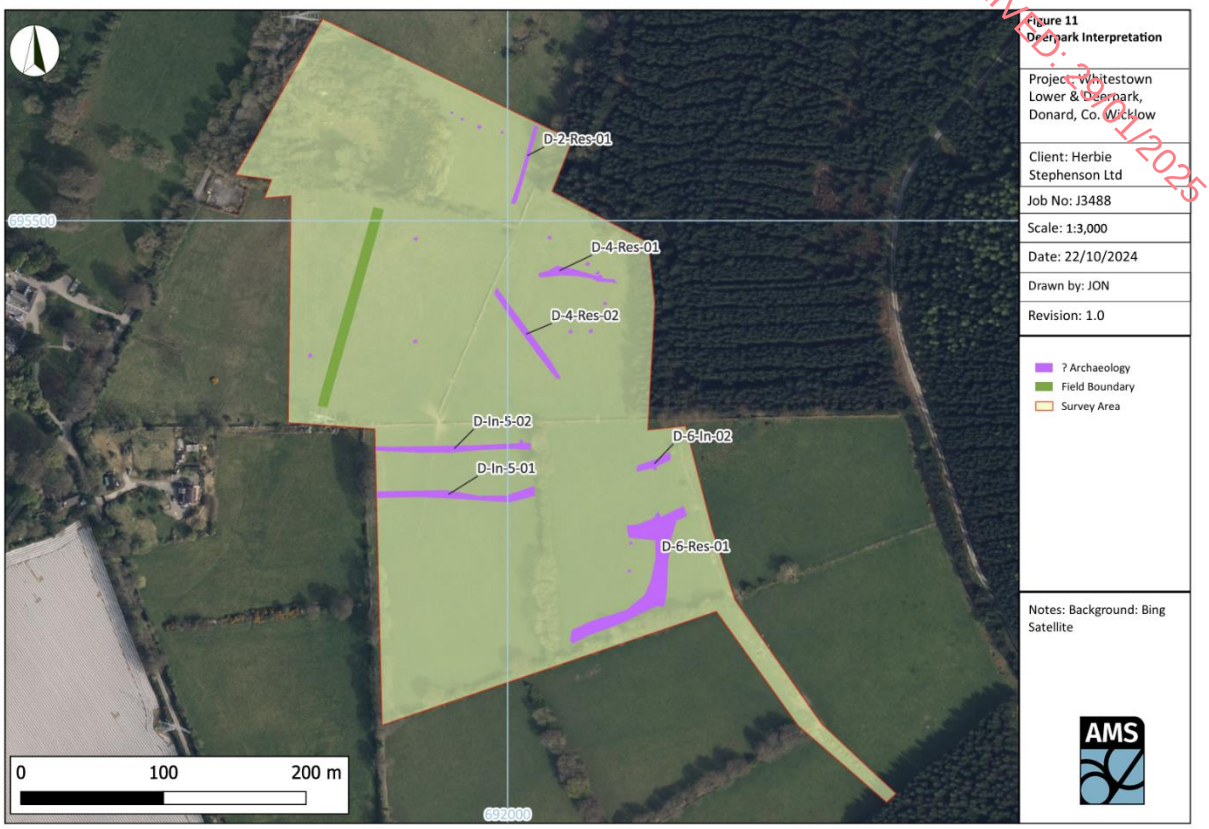
Area 6 is a large rectilinear-shaped field of steeply west-sloping pasture, enclosed by drystone walls with hedgerow and mature trees (Plate 13-10). There is no visible indication of any archaeological, architectural, or cultural heritage material at ground level.

Plate 13-10: View of Area 6 looking southwest

13.3.7 Geophysical Survey

An Electromagnetic Induction Survey was conducted by AMS in October 2024 (NMS Licence No. 24R0466) on 8.5 Ha. There were 7 anomalies identified and numbered in the report (see Table 13-8 and Fig 13-4 below). The anomalies are all linear or curvilinear anomalies. Three linears are aligned with the existing field system are probably relict field boundaries. The remaining linears and curvilinears may represent ditches, relict field boundaries or geology. There is nothing of definite archaeological significance, and therefore, the anomalies are assessed here as probably relict field boundaries or potential archaeology (see Appendix 13-3).

Figure 13-4: Geophysical survey interpretation drawing.



*Note: *The geographical survey (Figure 13-4) was conducted prior to the update of the current Redline Boundary; therefore, the previous Redline Boundary was used for this survey.*

Table 13-8: Geophysical survey results

Anomaly ID	Anomaly Type	Size	Description	Interpretation	Significance	Impact
D-2-Res01	? Archaeology	53m x 3m	Linear anomaly	This anomaly appears in the data for Res2 3. This is a linear anomaly running north-south.	Prob boundary marked on OS 1st ed map.	High
D-4-Res01	? Archaeology	56m x 4m	Curvilinear anomaly	This anomaly appears in the data for Res2 3. This is a curvilinear anomaly running east-west.	Potential	High
D-4-Res02	? Archaeology	76m 3.5m	Faint Linear anomaly	This anomaly appears in the data for Res2 3. This is a linear anomaly running in a northwest–southeast direction and may represent a possible ditch.	Potential	High
D-5-In-01	? Archaeology	112m x 6m	Faint linear anomaly	This anomaly appears in the data for Inph2 3. This is running in an east–west direction and may represent a possible ditch.	Aligned with boundary to north, prob relict boundary.	High

Anomaly ID	Anomaly Type	Size	Description	Interpretation	Significance	Impact
D-5-In-02	? Archaeology	108m x 4m	Faint linear anomaly	This anomaly appears in the data for Inph2 3. This is running in an east–west direction and may represent a possible ditch.	Aligned with boundary to north, prob relict boundary.	High
D-6-Res01	? Archaeology	123m x 42m	Faint curvilinear anomaly	This anomaly appears in the data for Res2 3. This may represent a large ditch feature or possible geological disturbance.	Potential	High
D-6-In-02	? Archaeology	27m x 4.5m	Curvilinear anomaly	This anomaly appears in the data for Inph2 3. This is running in an east–west direction and may represent a possible ditch.	Potential	High

13.4 Characteristics and Potential Effects of the Proposed Development

13.4.1 Construction and Operational Stage

Direct Effects

There will be an irreversible, significant, and permanent negative effect on seven potential archaeological anomalies identified through a geophysical survey in the application area. The setting of structure No. 3, the former Rectory, could potentially be subject to a worst-case, negative, significant and long-term effect while the quarry is in operation. There will be no other direct impact on any other known items of archaeology, buildings of heritage interest, or cultural heritage in the application area or the vicinity during the construction and operational phase of the proposal.

Indirect Impacts

There will be no indirect impacts on any known items of archaeology, buildings of heritage interest, or cultural heritage in the application area or the vicinity during the construction and operational phase of the proposal.

Interaction with other Impacts

No interaction with other impacts have been identified.

Do nothing Impact

If the Proposed Development were not to proceed there would be no negative impact on archaeology, buildings of heritage interest, or cultural heritage.

Worst Case Impact

In the worst-case scenario soil stripping in areas 2 and 3, has the potential to have a permanent, significant, irreversible, total, negative/adverse impact on previously unknown subsurface archaeological deposits or artefacts without preservation by record taking place.

Cumulative Impact

No screened projects in the vicinity of the application site which may lead to cumulative impacts have been identified and no cumulative impacts arise.

Major Accidents

No impacts on any known items of archaeology, buildings of heritage interest, or cultural heritage in the application area or the vicinity arising from unplanned events associated with the proposal have been identified by the assessment.

13.4.2 Closure Stage

Direct Impacts

There will be no direct impacts on any known items of archaeology, buildings of heritage interest, or cultural heritage in the application area or the vicinity during the closure phase of the proposal.

Indirect Impacts

There will be no indirect impacts on any known items of archaeology, buildings of heritage interest, or cultural heritage in the application area or the vicinity during the closure phase of the proposal.

Interaction with other Impacts

No interaction with other impacts have been identified.

Do nothing Impact

If the Proposed Development were not to proceed there would be no negative impact on the cultural heritage.

Worst case Impact

No worst-case scenario has been identified at closure stage.

Residual Impacts

After the proposed mitigation measures have been implemented there will be no residual impacts on cultural heritage present within the application area or the vicinity.

13.5 Proposed Mitigation Measures /Factors

- Due to the irreversible significant and permanent negative effect on seven potential archaeological anomalies identified through geophysical survey, these anomalies should be the subject of archaeological test excavation to define their interpretation and archaeological significance. Any archaeological material identified during test excavation should be preserved by record under licence from the National Monuments Service in advance of development; and,
- The potential effect on the setting of structure No. 3, the former Rectory, will be mitigated by the construction of a landscaped screening berm on the western side of the quarry where it faces the structure (see Fig 13-1).

13.6 Cumulative and In-combination Effects

No screened projects in the vicinity of the application site which may lead to cumulative impacts have been identified and no cumulative impacts arise.

13.7 Interaction with Other Environmental Attributes

No interaction with other environmental attributes has been identified.

13.8 Indirect Effects

There will be no indirect effects on any known items of archaeology, buildings of heritage interest, or cultural heritage in the application area or the vicinity during the closure phase of the proposal.

13.9 Residual Effect

After the proposed mitigation measures have been implemented, there will be no residual effects on cultural heritage present within the Site or the vicinity.

13.10 Monitoring

No additional monitoring, other than that required for mitigation, will be required.

13.11 Reinstatement

The Site will be subject to a Restoration Plan following the cessation of extraction on-site. Details of the Restoration Plan are included in Appendix 6-1.

13.12 Difficulties Encountered

No difficulties were encountered during the desktop study, field survey or in the preparation of this report.

14 MATERIAL ASSETS - TRAFFIC AND TRANSPORT

14.1 Introduction

This Chapter of the EIAR prepared by PMCE Ltd. assesses the traffic and transportation aspects of the Proposed Development. The assessment includes a comprehensive description of the transportation characteristics of the receiving environment, a first principal assumption on the expected level of trips associated with the Proposed Development and an analysis of the impact the volume of traffic will have on the local road network.

14.2 Methodology

In undertaking the assessment of the potential traffic and transport impacts on the local road network, the following guidance documents/reference material have been taken into account:

- Traffic and Transport Assessment Guideline" (published by Transport Infrastructure Ireland ('TII'), May 2014);
- Unit 5.3 (Travel Demand Projections) of the Project Appraisal Guidelines (TII, October 2021);
- "Project Appraisal Guidelines for National Roads Unit 16.1 - Expansion Factors for Short Period Traffic Counts" (TII, October 2016) ;
- Traffic Count Survey Data, collected by Traffinomics;
- DN-GEO-03031 Rural Road Link Design (TII, June 2017);
- DN-GEO-03060 Geometric Design of Junctions (priority junctions, direct accesses, roundabouts, grade-separated and compact grade-separated junctions (TII, June 2017) ; and,
- Topographical Survey Data / Mapping provided by Malone O' Regan Environmental Services Ltd.

14.2.1 Desktop Review

- A site visit on the 19th July 2023, at which time the weather was dry, and the ground surface was wet;
- 12-hour (7am – 7pm) manual classified Junction Turning Count ('JTC') surveys traffic surveys carried out by Traffinomics on the 7th June 2023;
- Trip Generation and Trip Assignment – This is used to derive trip rates and forecast trips for the Proposed Development, and to assign generated traffic flows onto the existing road network;
- Link Capacity Assessment - To estimate an Annual Average Daily Traffic ('AADT') value for each of the main roads on the surrounding road network and assess their capacity with and without the Proposed Development;
- Junction Capacity Assessment – The traffic count data was used to develop a model for four junctions on the existing road network and their capacity was assessed using the 'Junctions 9' computer program; and,
- Future Year Assessments – The estimated future year volumes on the study area network, as a result of the increase in background traffic and any site-related traffic, was used to assess the future operational performance of the junctions and surrounding road network for 2024 (assumed year of opening), and at two future assessment years, the opening year +5 (2030) and the opening year +15 (2040).

14.3 Receiving Environment

The Proposed Development will involve an average of 200,000 tonnes of material excavated from the Site annually.

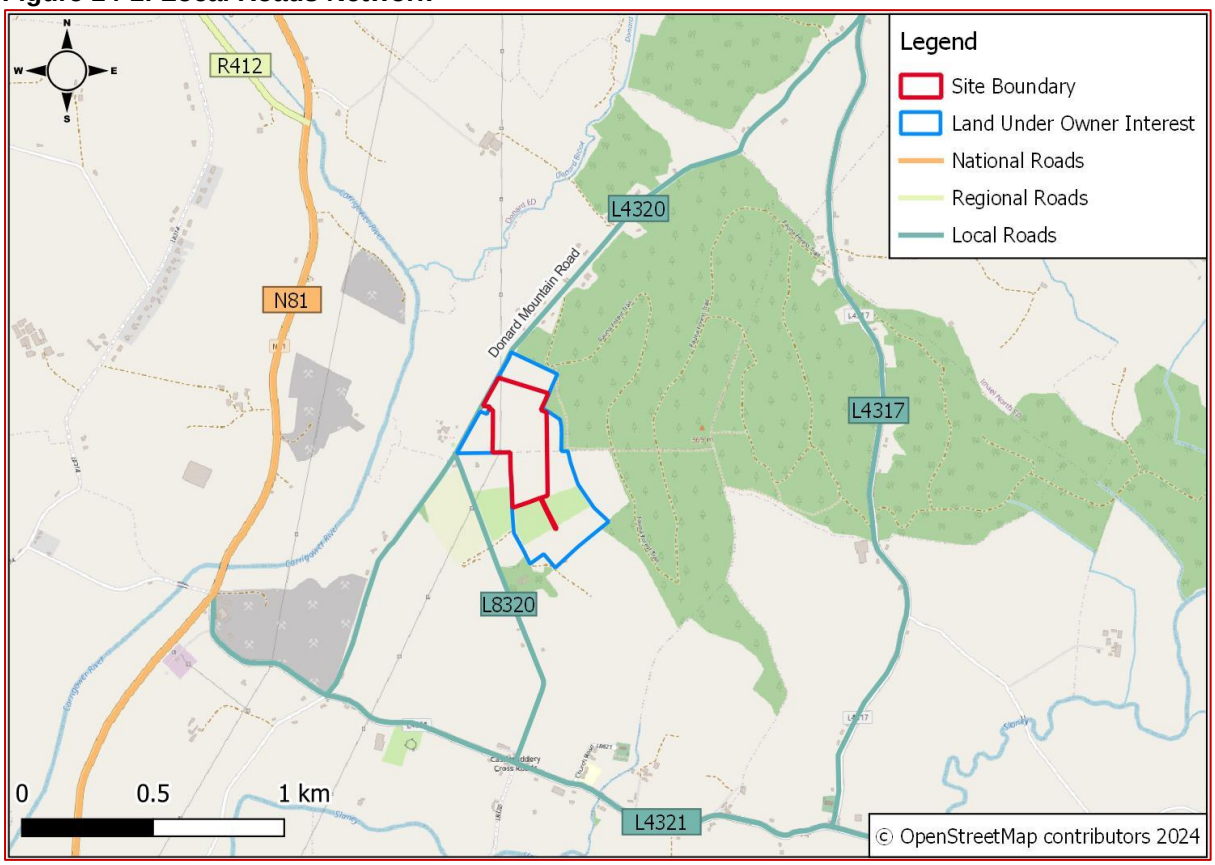
All Site related Light Vehicles and Heavy Goods Vehicles ('HGVs') will enter the Site via the existing old quarry entrance on the Donard Mountain Road, which links to the L4321 Local Road and provides access to the N81 National Road located ca. 650m to the west.

14.3.1 Site Location

The Proposed Development will be located in Deerpark, Co. Wicklow, ca. 2.3km southwest of Donard Village. The surrounding lands largely consist of greenfield sites and the nearest single dwelling unit is located ca. 200m southwest of the proposed site access.

The Site would be accessed from the Donard Mountain Road via an existing access at the old quarry site, with traffic approaching from the south.

Figure 14-1: Local Roads Network



14.3.2 Existing Road Network

14.3.2.1 Donard Mountain Road

The Donard Mountain Road runs adjacent to the western boundary of the Site in a northeast–southwest direction. To the west and north, the Site is bounded by the Fauna Forest.

The road is ca. 5m wide in the vicinity of the proposed site access; refer to Plate 14-1 below. The route between the Site and the crossroads junction with the L4321 Local Road to the south is narrow in place. However, there are existing laybys and field gates/property accesses where vehicles can pull in, which are wide enough to accommodate passing for two standard private cars. The Donard Mountain Road has a posted speed limit of 80 kilometres per hour ('kph') in the vicinity of the Site access.

Plate 14-1: Donard Mountain Road Looking North Towards the Site

14.3.2.2 L4321

The L4321 is a Local Road linking the N81 National Road with the Donard Mountain Road. It terminates at a crossroads junction with the L8325, L8265 and L8324 to the southwest of the Proposed Development. The L4321 is 1.4km long and runs in a west-east direction.

In the vicinity of the Site, the L4321 is 5.6m wide with no footways or hard strips. The posted speed limit of the L4321 in the vicinity of the Site access is 80kph.

14.3.2.3 N81

The N81 National Road is a two-way single-carriageway road with narrow hard strips on both sides of the carriageway in the vicinity of the proposed site. It runs in a north-south direction over a length of ca. 75km extending from Dublin in the north to Tullow, Co. Carlow in the south.

The road is ca. 6m wide in the vicinity of the Proposed Development and has a posted speed limit of 80kph.

14.4 Characteristics and Potential Effects of the Proposed Development

14.4.1 Existing Traffic

Traffic counts (12-Hour classified counts) were carried out on Wednesday 7th June 2023 at four junctions. Each of the traffic counts were carried out between 7:00am and 7:00pm.

This time period also includes the peak hours on the adjacent road network. Surveyed vehicles were broken down into five categories as follows:

- Cars;
- LGV's (Light Goods Vehicles);
- OGV1 (Two and three axle goods vehicles);
- OGV2 (Four and five axle goods vehicles); and,
- Buses.

The detailed results of the traffic survey are summarised in Appendix 14-1. The morning and evening peak hours have been established as follows:

- **4-Arm Crossroads Junction of the N81 and L4321** (referred to as the 'N81 Crossroads' in this report) – 08:15 to 09:15 (AM Peak) and 17:00 to 18:00 (PM Peak);
- **4-Arm Crossroads Junction of the Donard Mountain Road and L4321** (referred to as the 'L4321 Junction' in this report) – 08:15 to 09:15 (AM Peak) and 17:00 to 18:00 (PM Peak);
- **4-Arm Crossroads of the Donard Mountain Road with Old Rectory** (referred to as the 'Old Rectory Junction' in this report) – 08:30 to 09:30 (AM Peak) and 14:15 to 15:15 (PM Peak); and,
- **4-Arm Crossroads Junction of the L8320 and L4321** (referred to as the 'L8320 Junction' in this report) – 08:30 to 09:30 (AM Peak) and 17:00 to 18:00 (PM Peak).

The traffic count data for each site has been converted to Annual Average Daily Traffic ('AADT') values using the methodology described in "Expansion Factors for Short Period Traffic Counts" (Unit 16.1 NRA Project Appraisal Guidelines, October 2016). Appendices A to C of the above document were used in the expansion of traffic counts to AADTs.

A combined factor of 0.811 was arrived at by combining the individual hourly factors for the count duration. This factor was then used to determine the 24-hour traffic flow. This was then converted to a Weekly Average Daily Traffic ('WADT') using an index of 0.95 for the Wednesday traffic count. Finally, this was converted to AADT using an index of 0.96 for the month of June. These factors were used to calculate the AADT for each of the junctions. See Tables 14-1 to 14-4 below.

Table 14-1: Estimated AADTs at Junction 1 – (N81 Crossroads)

Hour Ending	N81 (S)	L4321	N81 (N)	L4321
08:00	344	31	403	96
09:00	305	54	368	137
10:00	258	33	288	123
11:00	199	18	223	74
12:00	219	52	270	119
13:00	211	28	229	124
14:00	245	26	247	122
15:00	244	35	246	121
16:00	305	45	322	130
17:00	344	21	392	129
18:00	453	49	510	174
19:00	338	35	363	162

Hour Ending	N81 (S)	L4321	N81 (N)	L4321
Period Total	**3,465**	**427**	**3,861**	**1,511**
Period Total HGVs	**270**	**51**	**333**	**196**
% HGVs	**7.8%**	**11.9%**	**8.6%**	**13.0%**
Total AADT	**3,897**	**481**	**4,342**	**1,700**

Table 14-2: Estimated AADTs at Junction 2 – (L4321 Junction)

Hour Ending	L4321 (W)	Donard Mountain Road (N)	L4321 (E)	Donard Mountain Road (S)
08:00	94	12	95	17
09:00	132	43	120	21
10:00	112	35	109	26
11:00	73	16	65	12
12:00	103	21	89	25
13:00	106	23	93	16
14:00	116	36	105	13
15:00	114	31	107	22
16:00	127	32	114	19
17:00	126	26	111	19
18:00	172	26	168	28
19:00	156	35	135	20
Period Total	**1,431**	**336**	**1,311**	**238**
Period Total HGVs	**148**	**24**	**157**	**19**
% HGVs	**10.3%**	**7.1%**	**12.0%**	**8.0%**
Total AADT	**1,610**	**378**	**1,475**	**268**

Table 14-3: Estimated AADTs at Junction 3 – (Old Rectory Junction)

Hour Ending	Donard Mountain Road (N)	L8320	Donard Mountain Road (S)	Old Rectory
08:00	15	3	12	0
09:00	49	8	43	0
10:00	44	9	35	0
11:00	22	6	16	0
12:00	23	2	21	0
13:00	23	2	23	2
14:00	41	7	38	0
15:00	41	11	31	1
16:00	43	11	32	0
17:00	30	7	25	0
18:00	35	10	27	0
19:00	40	4	35	1
Period Total	**406**	**80**	**338**	**4**
Period Total HGVs	**36**	**13**	**25**	**0**
% HGVs	**8.9%**	**16.3%**	**7.4%**	**0.0%**
Total AADT	**457**	**90**	**381**	**5**

Table 14-4: Estimated AADTs at Junction 4 – (L8320 Junction)

Hour Ending	L4321 (W)	L8320 (N)	L4321 (E)	L8320 (S)
08:00	83	3	79	11
09:00	129	8	116	21
10:00	109	9	94	16
11:00	70	6	67	9
12:00	80	2	62	26
13:00	102	2	88	20
14:00	104	7	91	14
15:00	107	11	91	23
16:00	121	11	105	21
17:00	111	7	98	16
18:00	153	10	138	23

Hour Ending	L4321 (W)	L8320 (N)	L4321 (E)	L8320 (S)
19:00	132	4	110	36
Period Total	**1,301**	**80**	**1,139**	**230**
Period Total HGVs	**158**	**13**	**148**	**21**
% HGVs	**12.1%**	**16.3%**	**13.0%**	**9.1%**
Total AADT	**1,464**	**90**	**1,281**	**259**

14.4.2 Traffic Generation and Trip Distribution

The Applicant has advised that an average of 200,000 tonnes of material would be excavated from the Site annually.

In determining the daily traffic volumes associated with the Proposed Development an average of 31 loads per day from the Site has been calculated based on the following assumptions:

- The Site operates for 48 weeks per year;
- Material is transported to/from the Site in 25 tonne loads; and,
- The Proposed Development opening times will be 08:00 to 16:00 on Monday to Friday but HGV movements and loading will be 07:00 to 19:00, giving 5.5 days per week.

Table 14-5 below summarises the calculation of daily trips to/from the Site from the average annual export rates.

Table 14-5: Transported Quantities of Material

Transported Quantities of Material	
Total Exported Material (tonnes per annum)	200,000
Quantity per Week (48 operational weeks/year)	4,167
Quantity per day (5.5 workings days/week)	758
Loads per day (25 tonnes per load)	31

The Proposed Development will employ 5 - 8 staff members when fully operational. A total of 8 staff members has been assumed for this assessment. Staff movements will, therefore, generate 16 peak hour trips, 8 trips inbound in the morning and 8 trips outbound in the evening peaks. Staff car movements have been distributed in accordance with the existing light vehicle distribution at the junctions of the surrounding road network.

Two trips have been assumed to occur daily to cater for possible miscellaneous trips associated with the Site. These miscellaneous trips allow for operations meetings, site inspections, maintenance operations for plant and machinery, refuelling, etc. It is not considered that these trips would coincide with either peak hour.

The total daily movements (two-way) associated with the Site accounts for 80 daily trips, 62 of which relate to HGVs (77.50%).

Table 14-6 provides a breakdown of the daily trips associated with the Proposed Development.

The Traffic and Transport Assessment contains extracts from the TRICS database giving the forecast arrival and departure distribution for quarry sites. By inspection it can be seen that the pattern of arrivals/departures is consistent with a short turn around within the sites, e.g. that vehicles generally arrive and depart within a short time period, likely to be less than an hour.

Table 14-6: Summary of Predicted Daily Trips in Opening Year and Beyond

Development	Type of Traffic	Daily Trips	
		Arrivals	Departures
Quarry	LVs (Staff)	1	1
	LV (Msc)	8	8
	HGVs	31	31
Total		40	40

The distribution of the development traffic on the adjacent road network is based on an assessment of the existing traffic flows on the road network derived from the traffic count data.

The assignment of the forecast development traffic onto the adjacent road network is based on the existing traffic flow distribution at each junction as derived from the traffic counts and projected routes.

Figure 14-2 below illustrates LGV traffic assignments.

Figure 14-2: LGVs Assignment of Development Traffic throughout the Adjacent Road Network

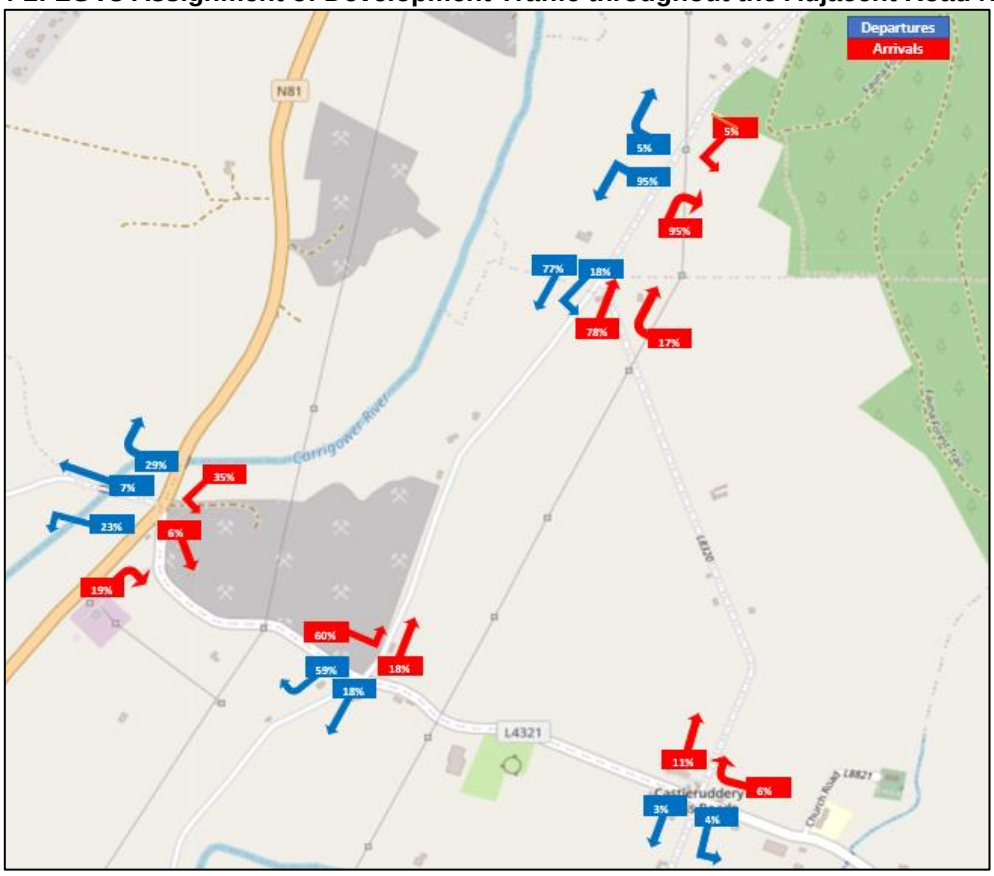
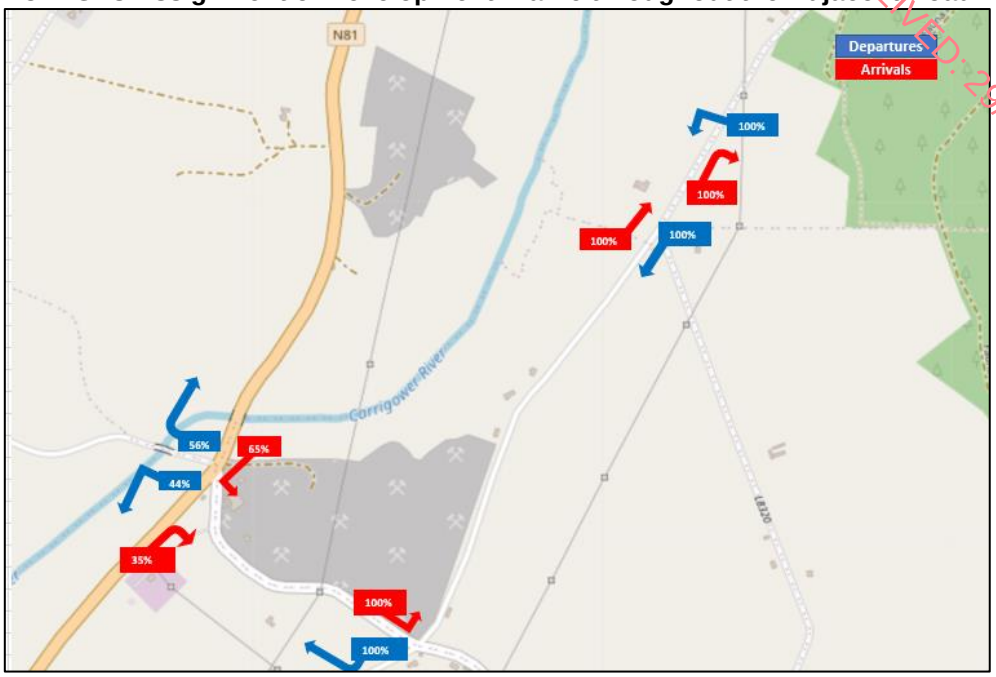


Figure 14-3 below illustrates HGV traffic assignments.

Figure 14-3: HGVs Assignment of Development Traffic throughout the Adjacent Road Network

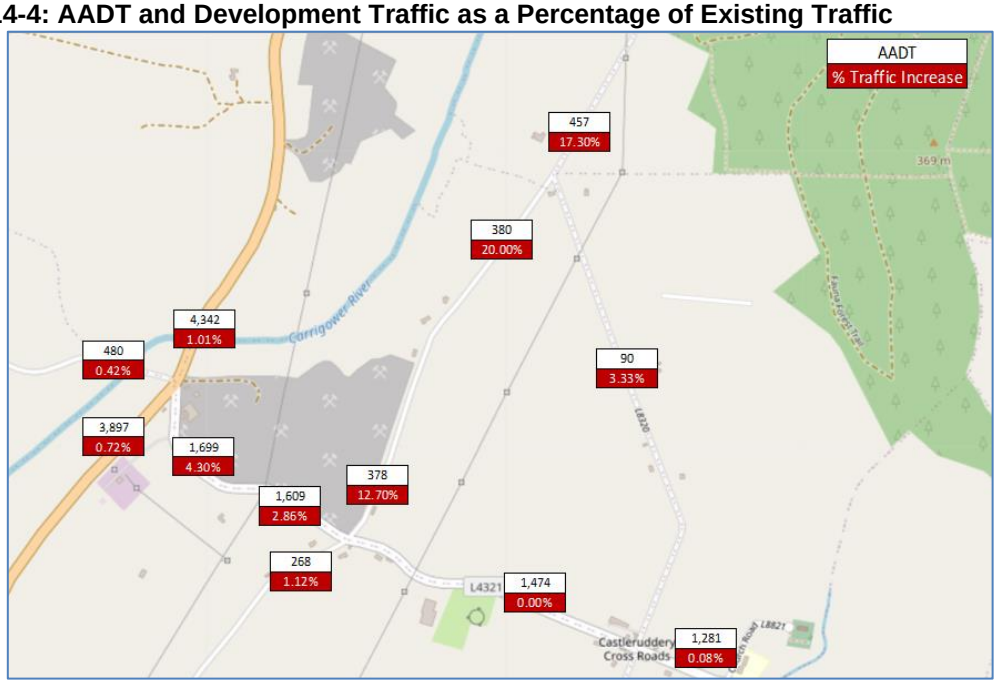


The Proposed Development will result in an increase in the traffic volumes at junctions within the road network in the vicinity of the Site.

Section 2.1 of the "Traffic and Transport Assessment Guidelines" published by Transport Infrastructure Ireland recommends that in an urban or congested setting that a traffic assessment should cover all of the roads and junctions where the development traffic exceeds 5% of the existing or background traffic, or 10% of background traffic when located in rural areas.

Figure 14-4 below outlines the distributed development traffic as a percentage of the background traffic on the adjacent road network.

Figure 14-4: AADT and Development Traffic as a Percentage of Existing Traffic



As shown in Figure 14-4 above the Proposed Development traffic is indicated as exceeding 5% of background traffic on the local road network along the primary haul route.

As a result, capacity assessment shall focus on the Donard Mountain Link Road and the following junctions:

- L4321 Junction;
- Old Rectory Junction; and,
- The proposed Site Access.

14.4.3 Future Year Traffic Growth

The “Traffic and Transport Assessment Guidelines” published by Transport Infrastructure Ireland recommend the assessment of traffic in the Opening Year, for the Opening Year +5 years and the Opening Year +15 years. The assessment years for the impact assessment are, therefore, 2025 for the Opening Year and 2030 and 2040 for the Future Assessment Years.

The "Project Appraisal Guidelines - Unit 5.3 – Travel Demand Projections (PE-PAG-02017)", published by TII in October 2021, has been used to determine future year traffic flows on the network from the 2023 traffic count.

Table 14-7 below contains a summary of the traffic growth factors published in the "Project Appraisal Guidelines". For this assessment, a central growth scenario has been adopted (a ‘central’ growth scenario was assumed given the Site location and scale)

Table 14-7: Future Year Traffic Growth Figures (County Wicklow)

Year	Low Growth		Central Growth		High Growth	
	LV	HV	LV	HV	LV	HV
2016-2030	1.0140	1.0361	**1.0157**	**1.0377**	1.0189	1.0412
2030-2040	1.0033	1.0153	**1.0051**	**1.0173**	1.0091	1.0211

14.4.4 Link Capacity Assessment Donard Mountain Road

The TII Publications document reference DN-GEO-03031 (June 2017) provides guidance on recommended rural road layouts in its Table 6/1. It advises that the capacity of a Type 3 Single Carriageway Road with 6.0m cross-section is 5,000 AADT for a Level of Service D.

The Donard Mountain Road adjacent to the quarry has an average cross-section width of ca. 4.4m with no hard shoulders present. Therefore, the Donard Mountain Road is considered to be most similar to the Type 3 Single Carriageway cross-section in this document with a capacity of 5,000 AADT for Level of Service D.

The combined background and Site Traffic volumes, outlined in Table 14-8 below in each of the assessment years is less than the LOS D capacity of 5,000 AADT for a Type 3 Single Carriageway. It is considered that the Donard Mountain Road will operate within capacity for each of the assessment years.

Table 14-8 below indicates that the traffic associated with the Proposed Development represents between 14.47% and 12.82% of the total traffic on the Donard Mountain Road during the assessment years 2025 to 2040.

Table 14-8: Combined AADT for each Assessment Year on the Donard Mountain Road

	Assessment Year			
	Existing	**2025**	**2030**	**2040**
Background Traffic	457	473	511	544
Additional Development Traffic	-	80	80	80
Combined Traffic (Background + Additional Dev. Traffic)	457	553	591	624
Additional Traffic as % of Combined Traffic	-	14.47%	13.54%	12.82%

14.4.5 Junction Capacity Assessment

The capacity of the surveyed junctions was assessed using the Transport Research Laboratory's ('TRL') Junctions 9 computer programme.

Junction performance is measured as a ratio between the flow and capacity ('RFC'). The capacity analysis has been carried out for a period of 12-hours, which corresponds to the operational hours of the Proposed Development for each of the assessment years (2025, 2030, and 2040).

A rural junction with an RFC below 0.85 is considered to be operating within capacity, and an RFC of 0.85 indicates a junction operating at capacity.

The capacity of a stream or arm of a junction refers to the maximum flow of vehicles entering the junction, within a given time period and is based on the formula given in LR942 (Kimber, 1980). The formulae describing the theoretical capacity of a junction were derived empirically and have a ±15% confidence interval. Consequently, the standard approach to junction capacity analysis for priority-controlled junctions uses an RFC of 0.85 to describe the theoretical maximum capacity; however, in reality, there may be additional capacity above this level.

Where the flow on an arm exceeds the theoretical capacity in a given time period, this will result in increased time to traverse the junction, leading to delays and queues forming. In normal operation, queues forming at a junction will dissipate over time as the volume of vehicles arriving at the junction falls below the available capacity.

The capacity of a signalised junction can also be measured by its Level of Service ('LOS'). The LOS is denoted by a letter ranging from A – F. The following list describes the traffic conditions on a road network for each Level of Service:

- **LOS A:** Free-flow traffic with individual users virtually unaffected by the presence of others in the traffic stream (free-flow);
- **LOS B:** Stable traffic flow with a high degree of freedom to select speed and operating conditions but with some influence from other users (reasonably free flow);
- **LOS C:** Restricted flow that remains stable but with significant interactions with others in the traffic stream. The general level of comfort and convenience declines noticeably at this level (stable flow);
- **LOS D:** High-density flow in which speed and freedom to manoeuvre are severely restricted and comfort and convenience have declined even though flow remains stable (approaching unstable flow);

- **LOS E:** Unstable flow at, or near, capacity levels with poor levels of comfort and convenience (unstable flow); and,
- **LOS F:** Forced traffic flow in which the amount of traffic approaching a point exceeds the amount that can be served. This is characterised by stop-and-go waves, poor travel times and low comfort and convenience (forced or breakdown flow).

It is, therefore, considered that a junction operating at a LOS E is close to, or at, capacity and a junction operating at LOS F is considered to be above capacity.

The detailed junction capacity analysis outputs for the analysed junction for each of the assessment years are contained in Appendix 14-2 of this report.

14.4.5.1 L4321 Crossroads

A summary of the junction capacity analysis results for the L4321 Crossroads are shown in Table 14-9.

The results indicate that the junction will continue to operate within capacity for each of the assessment years 2025, 2030 and 2040, and thus will have an imperceptible impact on the crossroad junction.

Table 14-9: Summary of Traffic Analysis at L4321 Crossroads

	12 Hours (07:00 – 19:00)			
	Queue (Veh)	**Delay (s)**	**RFC**	**LOS**
Stream	**2025 Without Development**			
Donard Mountain Road	0.1	10.78	0.07	B
L4321 (West)	0.0	11.02	0.03	B
Castlekelly Road	0.1	9.60	0.06	A
L4321 (East)	0.1	10.66	0.04	B
Stream	**2025 With Development**			
Donard Mountain Road	0.1	11.42	0.08	B
L4321 (West)	0.0	10.95	0.03	B
Castlekelly Road	0.1	9.61	0.07	A
L4321 (East)	0.1	10.68	0.04	B
Stream	**2030 Without Development**			
Donard Mountain Road	0.1	11.03	0.08	B
L4321 (West)	0.0	11.02	0.03	B
Castlekelly Road	0.1	9.86	0.07	A
L4321 (East)	0.1	10.60	0.04	B
Stream	**2030 With Development**			
Donard Mountain Road	0.1	11.61	0.08	B
L4321 (West)	0.0	10.96	0.03	B
Castlekelly Road	0.1	9.87	0.07	A
L4321 (East)	0.1	10.62	0.05	B
Stream	**2040 Without Development**			
Donard Mountain Road	0.1	11.34	0.08	B
L4321 (West)	0.1	11.04	0.04	B
Castlekelly Road	0.1	10.18	0.07	B
L4321 (East)	0.1	10.56	0.05	B
Stream	**2040 With Development**			
Donard Mountain Road	0.1	11.84	0.09	B
L4321 (West)	0.1	10.98	0.04	B
Castlekelly Road	0.1	10.19	0.07	B

	12 Hours (07:00 – 19:00)			
	Queue (Veh)	Delay (s)	RFC	LOS
Stream	**2025 Without Development**			
L4321 (East)	0.1	10.58	0.05	B

14.4.5.2 Old Rectory Junction

A summary of the junction capacity analysis results for the Old Rectory Junction are shown in Table 14-10 below.

The results indicate that the junction will continue to operate within capacity for each of the assessment years 2025, 2030 and 2040, and thus will have an imperceptible impact on the crossroad junction.

Table 14-10: Summary of Traffic Analysis at Old Rectory Junction

	12 Hours (07:00 – 19:00)			
	Queue (Veh)	Delay (s)	RFC	LOS
Stream	**2025 Without Development**			
L8320	0.0	14.01	0.02	B
Donard Mountain Road North	0.0	5.19	0.01	A
Old Rectory	0.0	8.33	0.02	A
Donard Mountain Road South	0.0	5.46	0.01	A
Stream	**2025 With Development**			
L8320	0.0	14.14	0.03	B
Donard Mountain Road North	0.0	5.19	0.01	A
Old Rectory	0.0	8.38	0.02	A
Donard Mountain Road South	0.0	5.49	0.01	A
Stream	**2030 Without Development**			
L8320	0.0	14.08	0.03	B
Donard Mountain Road North	0.0	5.19	0.01	A
Old Rectory	0.0	8.35	0.02	A
Donard Mountain Road South	0.0	5.47	0.01	A
Stream	**2030 With Development**			
L8320	0.0	14.21	0.03	B
Donard Mountain Road North	0.0	5.19	0.01	A
Old Rectory	0.0	8.39	0.02	A
Donard Mountain Road South	0.0	5.49	0.01	A
Stream	**2040 Without Development**			
L8320	0.0	14.17	0.03	B
Donard Mountain Road North	0.0	5.19	0.01	A
Old Rectory	0.0	8.36	0.02	A
Donard Mountain Road South	0.0	5.47	0.01	A
Stream	**2040 With Development**			
L8320	0.0	14.30	0.04	B
Donard Mountain Road North	0.0	5.19	0.01	A
Old Rectory	0.0	8.40	0.02	A
Donard Mountain Road South	0.0	5.49	0.01	A

14.4.5.3 Site Access Junction

A summary of the junction capacity analysis results for the junction of the Donard Mountain Road and the access to the Proposed Development are shown in Table 14-11 below.

The results indicate that the junction will continue to operate within capacity for each of the assessment years 2025, 2030 and 2040, and thus will have an imperceptible impact on the Site access junction.

Table 14-11: Summary of Traffic Analysis at Site Access Junction

	12 Hours (07:00 – 19:00)			
	Queue (Veh)	**Delay (s)**	**RFC**	**LOS**
Stream	**2025 With Development**			
Site Access	0.0	12.31	0.03	B
Donard Mountain Road	0.0	12.36	0.04	B
Stream	**2030 With Development**			
Site Access	0.0	12.34	0.03	B
Donard Mountain Road	0.0	12.39	0.04	B
Stream	**2040 With Development**			
Site Access	0.0	12.37	0.03	B
Donard Mountain Road	0.0	12.43	0.04	B

14.4.6 Sightlines

Sightlines at the access have been assessed against Section 5.6.3 of TII Publications document DN-GEO-03060, which requires 160m of unobstructed visibility (where the design speed is 85kph) at a point 3.0m back from the edge of the carriageway.

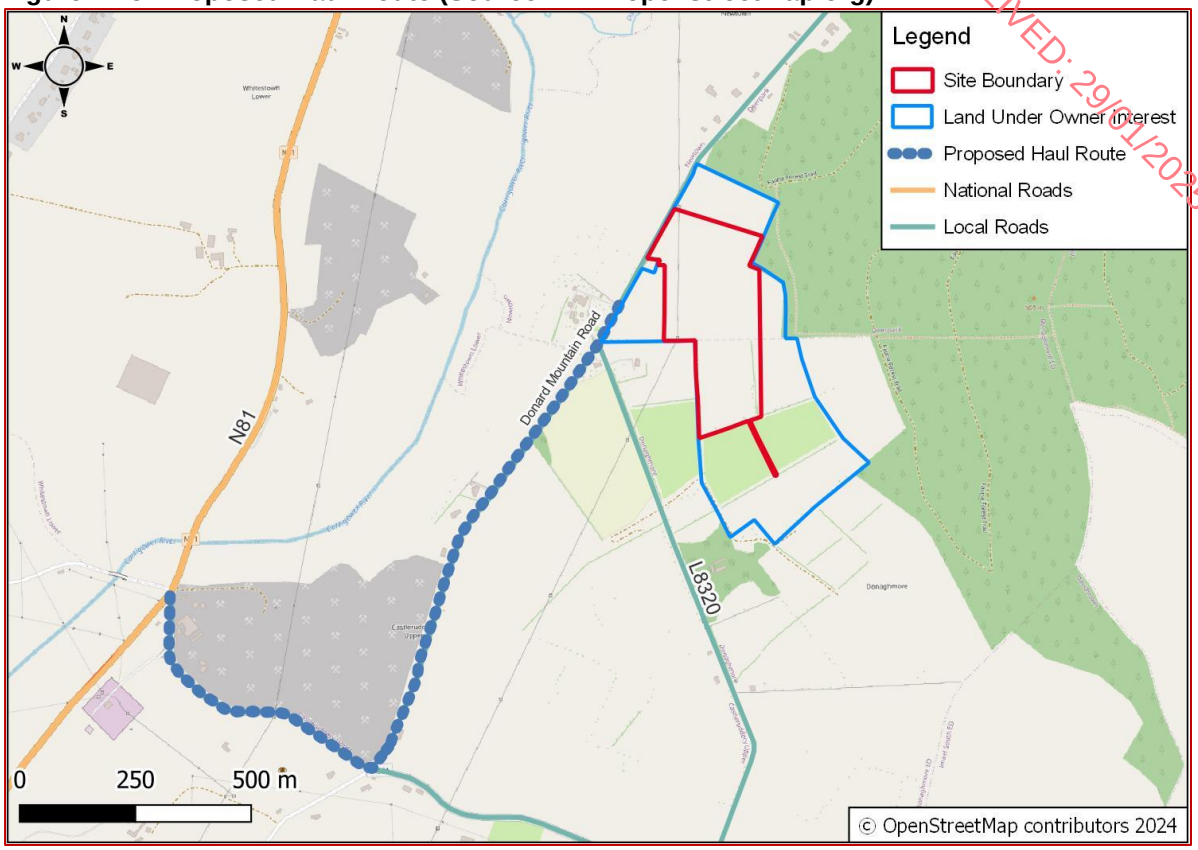
The posted speed limit on the Donard Mountain Road is 80kph. According to TII Publication Document DN-GEO-03060, a road with a design speed of 85kph requires 160m of unobstructed visibility in each direction.

Visibility splays exiting the quarry are currently restricted due to overgrown vegetation. Hedges and trees near the quarry entrance, within the visibility splay, will be removed / cut back and maintained regularly to ensure that the sightlines at the access are kept clear at all times.

Plate 14-2: Haul Route Visibility at Development Access

Traffic travelling to and from the Proposed Development will approach from the N81 National Road and depart towards this road when leaving the Site. The proposed Haul Route between the N81 and the Site access will include the L4321 and the Donard Mountain Road, as indicated in Figure 14-5 below.

Figure 14-5: Proposed Haul Route (Source: www.openstreetmap.org)



The length of the Donard Mountain Road forming part of the haul route is approximately 1.3km. The cross-section of the Donard Mountain Road is narrow in places, particularly between the L4321 and Old Rectory junctions. The alignment of the road is relatively straight with some localised horizontal curves; however, forward visibility is considered to be sufficient throughout the majority of its length.

The Donard Mountain Road is lightly trafficked with the traffic survey data indicating a total of 336 vehicles on the road at the L4321 junction and 338 vehicles at the Old Rectory Junction, which equates to approximately 28 vehicles per hour (in the 12-hour traffic survey period). The proposed development would generate an additional 40 trips equating to 80 additional vehicles on the Donard Mountain Road each day, approximately 10 per hour. It is, therefore, considered that the Donard Mountain Road can accommodate the expected additional traffic volumes due to its low volumes.

There are existing informal laybys and field gates/property accesses along the haul route, where vehicles can pull in, which are wide enough to accommodate passing for two standard private cars, however there may be difficulties for HGVs to pass opposing vehicles, particularly other HGVs. However, as part of the proposed quarry development, it is proposed to provide localised widening, where necessary, and formalise existing informal passing locations on the haul route, where appropriate. The cross section on the Donard Mountain Road would be widened between the Old Rectory junction and the Site access by reclaiming carriageway space from the overgrown verges on either side.

In consultation with the Local Authority, formal passing bays are proposed to be constructed on the haul route at appropriate locations between the Site access and the junction between the Donard Mountain Road and the L4321. These would remove the reliance on local property and field accesses when passing opposing traffic, and provide an engineered surface, including entry and exit tapers, for vehicles to pull-in when passing. These passing bays /

laybys will be strategically located in order to allow drivers to anticipate oncoming traffic and pull into the passing bay without the need for sudden deceleration or reversing.

14.4.7 Parking

Given the size of the Proposed Development and the proposed maximum number of staff, the parking provision within the Site has been assessed as being satisfactory.

14.4.8 Public Transport

There are no existing public transport provisions in place in the vicinity of the Site.

14.4.9 Pedestrians & Cyclists

There are no existing pedestrian or cyclist facilities within the vicinity of the Site. It is not envisaged that there is a desire line for pedestrians and cyclists to/from the Site.

14.4.10 Operational Assessment Conclusions

The following conclusions have been determined:

- Link capacity analysis was carried out on the Donard Mountain Road and it was determined that it will continue to operate within capacity for each of the assessment years, 2025, 2030, and 2040;
- The results of the junction capacity analysis indicates that all junctions will operate within capacity for each of the assessment years, 2025, 2030, and 2040;
- The assessment, therefore, indicates that the development will have a negligible impact on traffic flows on the existing road network due to the low volumes of traffic being generated by it;
- Visibility splays exiting the quarry are currently restricted due to overgrown trees and vegetation. Hedges and trees near the quarry access will be trimmed/removed, and maintained regularly, in order to ensure that the sightlines at the access are kept clear at all times;
- The cross-section of the Donard Mountain Road is narrow in places, particularly between the L4321 and Old Rectory junctions. There are existing laybys on the road, although some are informal and substandard, as well as field gates/property accesses, where vehicles can pull in. However, HGVs may experience difficulties when passing opposing vehicles, particularly other HGVs, at these locations. Additional passing bays and widening sections will be constructed at regular intervals along the Donard Mountain Road between the access to the Site and its junction with the L4321 such that opposing HGVs will be accommodated; and,
- The parking provisions have been assessed as satisfactory.

14.5 Proposed Mitigation Measures and/or Factors

14.5.1 Mitigation and Management

Following the link and junction capacity assessments, the trips associated with the operation of the Proposed Development at Donard, Co. Wicklow, were found to have an imperceptible impact on the link capacity of the Donard Mountain Road and the junction capacity of the junctions in the vicinity of the Site.

The impact of the Proposed Development in relation to road safety and the existing road infrastructure was also determined to be imperceptible.

However, additional passing bays and widening were identified as measures that will maintain the quality of infrastructure along the quarry haulage route. Passing-bays/laybys will be constructed at regular intervals along the Donard Mountain Road between the access to the

Site and its junction with the L4321.These passing-bays/laybys will be strategically located in order to allow drivers to anticipate oncoming traffic and pull into the passing-bay without the need for sudden deceleration or reversing.

14.6 Cumulative and In-Combination Effects

A search of planned future developments which may have an impact on future traffic flows in the vicinity of the Proposed Development was undertaken. These are developments that have received planning permission but have not yet commenced construction. Their cumulative effects in combination with the Proposed Development were assessed and found to have an imperceptible impact on the local road network.

14.7 Interactions with Other Environmental Attributes

The vehicular traffic flows that shall be generated by the Proposed Development may result in corresponding changes to noise levels and air quality in the vicinity of the surrounding road network. The nature, extent and consequences of these changes are examined in Chapters 9 and 11 of this EIAR.

14.8 Indirect effects

The indirect effects of the Proposed Development in relation to traffic on the surrounding road environment are deemed to be imperceptible.

14.9 Residual effects

The residual effects of the Proposed Development in relation to traffic on the surrounding road environment are deemed to be imperceptible. However, additional passing-bays/laybys will be constructed on the Donard Mountain Road; this will have a significant, long-term, positive effect on the cross-section of this road between the Site and its junction with the L4321.

14.10 Monitoring

Monitoring of the traffic impacts to the surrounding road and junction network's performance is not considered to be required, as the Opening Year+5 and Opening Year+15 analysis has determined that the local road network will continue to operate within capacity, with an imperceptible impact from the Proposed Development.

14.11 Reinstatement

The proposed restoration of the Site will occur following the exhausting of the aggregates within the Proposed Development; as such, road traffic from the Site will return to existing volumes.

14.12 Difficulties Encountered

There were no particular difficulties encountered during the compilation of this chapter.

15 INTERACTIONS OF THE FOREGOING

The major interactions between the environmental impact topics are assessed within the above chapters of this EIAR. Table 15-1 demonstrates a matrix to summarise the interactions between effects on the various topic areas.

Table 15-1: Interactions between environmental impact topics

Description	Population and Human Health	Biodiversity	Land Use, Soils and Geology	Water	Air Quality	Climate	Acoustics (Noise and Vibration)	Landscape and Visual	Cultural Heritage	Material Assets – Traffic and Transport
Population and Human Health		✓	X	✓	✓	✓	✓	✓	✓	✓
Biodiversity			✓	✓	✓	✓	✓	X	X	X
Land, Soils and Geology				✓	✓	X	X	✓	X	X
Water					X	X	X	X	X	X
Air Quality						✓	X	X	X	✓
Climate							X	X	X	✓
(Acoustics) Noise and Vibration								X	X	X

Description	Population and Human Health	Biodiversity	Land Use, Soils and Geology	Water	Air Quality	Climate	Acoustics (Noise and Vibration)	Landscape and Visual	Cultural Heritage	Material Assets – Traffic and Transport
Landscape and Visual									X	X
Cultural Heritage										X
Material Assets – Traffic and Transport										

Table 15-2: Indication of interaction for Table 15-1 above

Interaction	✓
No Interaction	X

16 SCHEDULE OF COMMITMENTS

Table 16-1 outlines the environmental commitment which will be undertaken as part of the Proposed Development, during the Site Preparation and Operational Phase.

Table 16-1:Schedule of Commitments

Commitment
General
Quarrying activities will comply with all relevant legislation and best practice to reduce any potential environmental impacts.
The quarry operator contractor will ensure that all personnel working on-site are trained and aware of the mitigation measures detailed within the EIAR.
The Proposed Development involves the re-commissioning of an existing old quarry and extension into land to the east and south of the Site for an overall extraction area of ca. 5.01ha and to an extraction depth of 165mAOD. The Site boundary covers a total area of ca. 8.01ha.
The Proposed Development will have 3 distinct stages per Phase: • Stage I: Removal of topsoil and overburden; • Stage II Aggregate Extraction (blasting), Processing, Stockpiling & Haulage to Market; and, • Stage III: Restoration.
Additional facilities such as canteen, office and washroom facilities will be required and constructed in the old quarry.
A restoration plan will be submitted as part of this application and will develop on the proposed landscaping works, providing for the additional embankment/berms, woodland planting, the provision of future habitats for both flora and fauna species and rehabilitation measures to be undertaken once operations have ceased.
The main construction hours for the Proposed Development will be from 08:00 to 18:00 Monday to Friday and 08:00 to 14:00 on Saturday. No works will take place on-site on Sundays or Bank Holidays/Public Holidays.
HGV movements in and out of the quarry will occur up to 1hour before and after quarry operations, to allow for departure of HGV loaded the previous day and ensure returning HGVs can access the Site at the end of the day.
A wheel wash and weighbridge will be constructed at the main construction access.
No fuel will be stored within the Site. Re-fuelling of mobile plant will be via a fuel bowser.
Biodiversity

Commitment
The following mitigation measures will be incorporated and adhered to during the Construction and Operational Phases at the Site to ensure that the works do not result in contravention of wildlife legislation: • Quarrying activities will comply with all relevant legislation and best practice to reduce any potential environmental impacts. The mitigation measures detailed within this EIAR will be fully adhered to; and, • The quarry operator contractor will ensure that all personnel working on-site are trained and aware of the mitigation measures detailed within the EIAR.
General Measures • An ECoW will inspect the Site in advance of works commencing and will undertake Site inspections as required during the works to ensure that all works are completed in line with the measures in this EIAR and wildlife legislation; • As part of the Proposed Development, ca. 453m of treelines, ca. 0.56 ha of woodland and ca. 0.14 ha of scrub will be removed. The vegetation removal, ground clearance and soil stripping works will be supervised by the ECoW; • If any protected or notable species are identified on-site, including common frog, the ECoW will be contacted for advice; • Noise mitigation measures have been included in Chapter 11: Noise and Vibration to reduce potential disturbance effects on the local environment. This will in turn, protect species within the wider area; • Groundwater protection measures have been included in Chapter 8: Water (Hydrogeology and Hydrology) to prevent potential contamination of ground and surface water. These measures will ensure the protection of the aquatic environment and species; • The quarry faces and benches will be left bare for invertebrate species that specialise in bare ground habitats whilst the areas atop the quarry face will be allowed to naturally recolonise over time; • The Site will be subject to a Restoration Plan following the cessation of extraction on-site. Details of the Restoration Plan are included in Appendix 6-1. • The attenuation ponds will be retained and planted with a wet meadow mix. These ponds will be subject to monitoring in years 1, 3 and 5 to confirm the success of the habitat creation works and to assess if amphibians, invertebrates or other wildlife are using these habitats; and, • The Site will be subject to an updated ecological assessment after operations have ceased to ensure that the recommendations within the Restoration Plan remain relevant and to ensure that the works required to implement the plan will not result in any impacts on biodiversity or breaches of relevant wildlife legislation.
Protection for Birds **<u>Nesting Birds</u>** • As per Section 40 of the Wildlife Act 1976, as amended by Section 46 of the Wildlife (Amendment) Act 2000, the cutting, grubbing, burning or destruction by other means of vegetation growing on uncultivated land or in hedges or ditches will be restricted during the nesting and breeding season for birds and wildlife, from 1st March to 31st August. All vegetation clearance on-site will be conducted in line with this legislation; • In the unlikely event that works need to be undertaken within the main breeding season, this would be undertaken in consultation with NPWS and the ECoW; • Prior to any vegetation removal, the ECoW will inspect the Site;

Commitment

- All vegetation clearance works will be undertaken in a systematic way. The ECoW will inspect the Site during the vegetation clearance works;
- In the unlikely event that birds nest within the active working area during the construction works, all works will stop within the immediate area and the ECoW will be consulted for advice;
- All Site personnel will be made aware of the locations of significant bird species and habitats prior to the commencement of works;
- Where possible, significant ornithological habitats will be retained on-site;
- Five long-eared owl nest baskets will be installed throughout the Site, including in the retained scrub/woodland habitat on the proposed berms planted with native trees. The exact location will be confirmed by the ECoW. These baskets will provide potential nesting habitat for these species. The installation of these nest baskets will be undertaken by an expert tree climber or off-road mobile elevated work platform ('MEWP'); and,
- In the unlikely event that birds nest within the active working area during the construction works, all works will stop within the immediate area and the ECoW will be consulted for advice; and,
- If peregrine falcon or other notable / protected bird species are identified colonising any areas to be impacted by the operations on-site, then works will stop within the identified area. An appropriate undisturbed buffer zone will need to be established for the duration of the breeding season or until the chicks have fledged and left the nest. This will be confirmed by the ECoW.

Peregrine Falcon

To avoid potential impacts on peregrine falcons as a result of the proposed works, the following measures will be implemented:

- Construction works should begin outside of the main breeding season (1st March to 31st August) to allow peregrine falcon time to habituate to the Proposed Development;
- All personnel operating on-site will be made aware of the legal protection afforded to peregrine falcons and biodiversity signage will be erected throughout the quarry;
- The existing northern and northeastern rock faces will be retained and optimised where possible (i.e. both areas will be extracted as early as possible during construction to create a long-term dormant rock face). This will ensure older suitable faces are maintained for peregrine falcon throughout the construction, operation and restoration phases. A nest box will be installed along the northeast quarry face after quarrying in this area has ceased;
- As works progress through the Site, additional alternative nest ledges and/or artificial boxes will be created at two-three locations near the top of the developing cliffs on the northeastern and eastern rock faces;
- If peregrine falcon are identified colonising any areas to be impacted by the Proposed Development, then works will stop within the identified area. An appropriate undisturbed buffer zone will need to be established for the duration of the breeding season or until the chicks have fledged and left the nest, which will be confirmed by the ECoW;
- Should a peregrine falcon nest be identified on-site, all personnel operating on the Site will be made aware of the presence and location of the nest. Access will be restricted below cliffs which are actively being utilised by peregrine falcons. This will be done using fencing and/or other appropriate barriers;

Commitment
• Infrastructure will not be installed, nor any material stockpiled, within 25-50m of rock faces supporting peregrine falcon. Vegetation should also be managed within this 25-50m area to keep vegetation away from nest locations. All vegetation management or required barrier installation will take place outside of the breeding bird season; • No blasting should occur along the western rock face during the main breeding season (unless the breeding status of peregrine falcon is confirmed to have failed by an experienced raptor ecologist); • A buffer of 25-50m will be implemented from any identified peregrine falcon nests on-site if works are required during the breeding season (in consultation with a raptor expert). This distance may be increased if this buffer is deemed insufficient and peregrine falcon become disturbed due to works on-site; • As part of the restoration plan for the Site, the quarry ledges will be left in place and unplanted. This will provide suitable breeding habitat for peregrine falcon; • The breeding status of peregrine falcon will be established immediately prior to construction or extraction, if works are required within 25-50m of the breeding nest cliffs during the main breeding period; and, • An annual peregrine falcon monitoring programme will be established during the construction and extraction phases of the Proposed Development to establish the potential effects, if any, of the Proposed Development on peregrine falcon. It should also be established if peregrine falcon occupy the Site during the winter. This monitoring programme will be undertaken with a suitably qualified raptor expert, quarry operators and the NPWS.
Measures for Invasive Species In order to mitigate against the unintentional introduction of invasive species to the Site during quarrying operations, the following measures will be followed in line with policy CPO 17.17 of the CDP and the NRA guidelines for the management of noxious weeds and non-native invasive plant species: • All vehicles, machinery and any other equipment that may be used for the works will be washed and cleaned prior to being mobilised to the Site to prevent the import of plant material / seeds; • Prior to machinery or equipment being unloaded at the Site, equipment will be visually inspected to ensure that all adherent material and debris has been removed; and, • Any vehicles and machinery that are not clean will not be permitted entry to the Site.
Protection for Amphibians There are no suitable breeding habitats for amphibians on-site, but the habitats are considered to be suitable for amphibians during the terrestrial phase of their life cycle. Additionally, one common frog was identified in the lands under owner interest to the north of the Site during a reptile survey. Therefore, the following mitigation measures will be implemented: • The vegetation clearance of woodland and scrub and ground stripping works will be supervised by the ECoW; • If amphibians are encountered during these works, the ECoW will relocate them to suitable areas outside of the Site boundary; and, • Should amphibians be encountered during operations the ECoW will be consulted for advice.

Commitment
Protection for Bats The following mitigation measures will be followed during the works to ensure that no impacts occur to bats: • A minimum buffer of 5m will be maintained between the proposed extraction area and the retained treelines on-site. This will ensure that bats can continue to utilise the retained linear features for foraging and commuting purposes; • The construction of two vegetated screening berms will provide potential foraging and commuting habitat for bats; and, • The Restoration Plan includes for the creation of woodland habitats and the planting of two vegetated berms with native trees during the initial phase of the Proposed Development. This will maintain potential foraging habitat for bats. The attenuation ponds will also be retained and bound by a wet meadow mix to provide additional areas for foraging bats.
Measures for Terrestrial Mammals Given the presence of habitats within the Site boundary that have the potential to support sheltering, foraging and commuting mammals (inclusive of badgers), general construction procedures and mitigation measures which are in line with the NRA (now TII) guidance for badgers will be implemented : • The clearance of the woodland and scrub habitats on-site will be supervised by the ECoW; • Should unidentified burrows be identified within the works area during Site clearance or operations, the ECoW will be contacted for advice and consult with the NPWS as required; • Exclusionary fencing will be installed in between the constructed berm and existing treelines bordering the Site. This will exclude terrestrial mammals from the proposed extraction area and associated ledges.
Measures for Nocturnal Species Any lighting introduced onsite will be in line with the following measures: • Any lighting introduced onsite will be in line with the following measures: • Avoidance of excessive lighting; • Lighting will be aimed only where it is needed, with no upward lighting; • Lighting will be installed with a sensor timer so that lights only switch on when activated by a person; • Lighting will be directed away from retained scrub / woodland habitats, planted areas and hedgerows / treelines, where possible; • Accessories such as baffles, hoods or louvres will be used to reduce light spill and direct light only where it is needed; and,

Commitment
• The height of any lighting introduced onsite will be reduced as much as possible, as lighting at a low level further reduces ecological impact.
Measures for Otters In addition to the mitigation measures listed below which relate to the protection of soils and water quality, the following mitigation measure will be implemented to protet otters: • If unidentified holts are identified within the works area during construction, works will cease within the area and the ECoW will be contacted for advice.
Protection of Treelines To ensure that no impacts or unnecessary damage occurs to the retained treelines that border the Site as per policy CPO 17.14 of the CDP, the following protection measures will be adhered to during the works: • Care will be taken when planning ground clearance to ensure that no machinery or plant comes into contact with retained trees. Such contact can result in serious damage to them and might make their safe retention impossible; • Where machinery access has to encroach areas within close proximity to retain trees, a Root Protection Area ('RPA') will be established, and suitable ground protection will be put in place to prevent any significant soil compaction or root damage. This should take the form of suitable strength ground protection mats or cellular confinement system capable of supporting the appropriate weight; • When tree removal is required in close proximity to retained trees, felling must be carried out in small sections to avoid damage to adjacent trees; • Planted berms will be created in between the proposed extraction area and retained treelines to the south and west. Exclusionary fencing will also be installed between the retained treelines and planted berms. This will act as an additional protective barrier in between the retained trees and areas of disturbance; • A minimum buffer of 5m will be maintained between the retained treelines on-site and areas of disturbance i.e. the proposed extraction area and the proposed berms. This buffer will be extended as required to include the full crown extent of the retained trees bordering the Site; • No materials, equipment or machinery will be stored within close proximity to retained treelines; • Notice boards, wires, etc. will not be attached to any trees; • The construction of the berms on-site will be supervised by an ECoW to ensure that no impacts occur to bordering treelines. The retained trees will be assessed following the completion of these works; and, • In order for treeline protection measures to work effectively, all personnel associated with the operation of heavy plant machinery must be familiar with the above principles for the protection of treelines.
Proposed Planting

Commitment
Two vegetated screening berms will be constructed along the south and west boundaries of the Site. • The combined length of the planted berms will be 513m and these berms will be 3m high and 11m wide; • These berms will be planted with native tree species and will compensate for the treelines which will be removed as part of the Proposed Development; • 1.03ha of woodland will be planted to the north of the Site in order to replace the woodland and scrub habitats removed as part of the Proposed Development. Additionally, 0.393ha of planting will occur along the eastern boundary of the Site in between the proposed quarry face and the existing treelines; and, • The planting will take place within the first available season (November to March) and any trees that fail to become established within 5 years of planting will be replaced by trees of a similar size/species within the next available planting season.
Land Use, Soils and Geology
Oil Storage / Refuelling The following mitigation measures will be applied, in accordance with the EPA (2006) Environmental Management Guidelines: Environmental Management in the Extractive Industry (Non-Scheduled Minerals); • All quarry vehicles will be refuelled on a hard-standing area via a dedicated refuelling bowser with adequate spill protection measures employed; • Items of plant and machinery will be refuelled by a competent person utilising adequately sized and positioned drip trays; • Absorbent sands and a full spill kit system will be adjacent to all refuelling operations; • Any fuel/ oils (and/or lubricants) used at the Site will be stored in a double skin tank and will be appropriately bunded. No fuel will be stored within the Site; • The wheel wash will be serviced and maintained, including the removal of sediment off-site periodically by a permitted contractor to a licensed facility, to prevent the release of finer sediment, fuels and greases that accumulate over time; • Unauthorised access is prevented in so far as possible; and, • Any hazardous waste, such as waste oils, generated on-site will be collected in leak-proof containers and stored on-site in designated areas to be collected and recycled / disposed of by an authorised waste contractor in accordance with the relevant waste regulations. In addition, the following measures will be implemented to prevent contamination release: • Preventative maintenance and relevant maintenance logs will be kept for all on-site plant and equipment; • Procedures and contingency plans will be set up to deal with emergency accidents or spills; • Lubricants and hydraulic fluids for screening equipment used on the Site will be carefully handled to avoid spillage, properly secured against unauthorized access or vandalism, and provided will spill containment according to best practice codes; and,

Commitment
• Any spillage of fuel, lubricants or hydraulic oils will be immediately contained, and the contaminated soil removed from the Site and appropriately disposed of.
Soil Management Stockpiling of the excavated material will be required and will be appropriately managed on-site. All topsoil will be stored in stockpiles, some of which will be used for the remediation stage of the Site. Topsoil removal and storage will be conducted considering best practice guidance from DEFRA (2009). To minimise the overall impact on soils arising during the construction phase, the following mitigation measures will be adhered to; • The structure of the soil will be disturbed as little as possible to maintain its quality - ;the topsoil layer will be stripped out and stored separately in stockpiles to maintain its functional use for restoration and landscaping. The subsoils layer will also be stripped out and stored in different stockpiles to maintain the structure as much as practicable; • Soil stripping and stockpiling will not take place during particularly dry or wet weather. This will minimise damage to the soil structure; • The stockpiles will clearly be defined to differentiate soil materials; • Unnecessary soil compaction in the berms should be avoided to limit the development of anaerobic conditions in soils at the centre of the berm; • The traffic movement will be confined to designated routes; • There will be no soils removed off-site; • Berms should be seeded as soon as possible to ensure the stability of the stockpiled soil; • Silt fencing will be installed where required to prevent the erosion of berms into the quarry pit and water management ponds; and, • Berms will be dampened down during dry periods to prevent wind dispersion until planting has been established.
Water
During preparatory and operational works at the Proposed Development the usage of fuel powered equipment and machinery will be required. In order to limit the risk of contamination from these materials mitigation measures will be in accordance with the EPA (2006) Environmental Management Guidelines: Environmental Management in the Extractive Industry (Non-Scheduled Minerals) whereby; • Items of plant and machinery will be refuelled by a mobile fuel bowser by a competent person utilising adequately sized and positioned drip trays; • Absorbent sands and a full spill kit system will be adjacent to all refuelling operations. Any oils or lubricants used at the Site will be stored appropriately. No fuel will be stored within the Site. • The wheel wash will be serviced and maintained, including the removal of sediment off-site periodically by a permitted contractor to a licensed facility, to prevent the release of finer sediment, fuels and greases that accumulate over time;

Commitment

• Unauthorised access is prevented in so far as possible;
• Any hazardous waste, such as waste oils, generated on-site will be collected in leak-proof containers and stored on-site in designated areas to be collected and recycled/disposed of by an authorised waste contractor in accordance with the relevant waste regulations;
• No foul discharge to ground or water will arise at the Site; and,
• Hygiene facilities (a toilet and sink) will be constructed on-site.
In addition, the following measures will be implemented to prevent contamination release:
• Silt fencing will be installed where required to prevent the erosion of berms;
• Preventative maintenance and relevant maintenance logs will be kept for all on-site plant and equipment, including the generator associated with the water management system pump;
• Procedures and contingency plans will be set up to deal with emergency accidents or spills;
• Lubricants and hydraulic fluids for screening equipment used on the Site will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided will spill containment according to best practice codes;
• Any spillage of fuel, lubricants or hydraulic oils will be immediately contained, and the contaminated soil removed from the Site and appropriately disposed of;
• Any pumping from the water management ponds into the land drainage system leading to the overflow pond will be restricted to agricultural rates;
• The generator for the pumping system will be appropriately bunded to limit a potential leak of fuel or lubricant into the water management ponds;
• The water management ponds will be inspected weekly and quarterly to screen for the presence of hydrocarbons in the tanks.
  ○ If hydrocarbon contamination is detected, any pumping of water to discharge from the ponds will cease. The installed pump will be inspected and will be cleaned/undergo maintenance to remove any residual hydrocarbons before it is returned to use; and,
  ○ As soon as feasible, any contaminated water will be removed from the ponds using a separate pump and stored on-site in secure containers for collection by an appropriately qualified waste contractors.
• The water management ponds will be inspected visually prior to pumping.

Air Quality
A Dust Management Plan (‘DMP’) will be prepared for the Site and agreed upon by the Local Authority.

Commitment
The DMP will be implemented during all phases of the Proposed Development. The mitigation measures can be divided into Design Measures, Construction Phase, Operational Phase and Rehabilitation Phase.
Design Measures The design measures to reduce dust will include: • Treelines and hedgerows surrounding the Site boundary will be enhanced during the Construction Phase and maintained during the Operational and Rehabilitation Phases. The treelines, once mature, should result in dense foliage; • The materials initially excavated from the Site will be used to build an embankment along the southern eastern and western boundaries, which will be planted to significantly reduce risk of disamenity dust leaving the Site boundary in the subsequent Operational Phase; • Extraction of the Site will be done in phases which will help to reduce large areas of exposed soil, which reduce the risk of disamenity dust leaving the Site boundary; • A setback of 150m will be put in place from the nearest sensitive receptor, which will further reduce the risk of disamenity dust leaving the Site boundary; • HGVs will pass through wheel wash onto hardstanding prior to leaving the Site; • Access roads will consist of hardstanding minimising exposed surfaces; and, • Exposed surfaces, e.g. topsoil and overburden storage mounds, will be planted with fast-growing plants.
Construction and Operational Phase The following mitigation measures will be implemented to minimise dust generation, during the Construction Phase and Operational Phases: **General** • A DMP must be produced and adhered to during all phases of the Proposed Development; • Record all dust and air quality complaints, identify cause(s), take appropriate action; • A logbook record of complaints will be maintained and made available to the local authority on request; • Provide training to Site personnel on dust mitigation measures that will be implemented at the Site; • Regular inspections will be carried out in line with the DMP around the boundary of the Site; and, • Maintaining a good communication with the local community; • The frequency of the Site inspections will increase during;

Commitment
• High dust-generating activities on-site; and, • Prolonged dry or windy conditions, particularly in the case of earthworks.
Site preparation • Soil stripping and overburden handling will be avoided during dry and windy (>5.5m/s) conditions; and • Overburden will only be worked when it contains a high moisture content.
Mineral processing • Crushing and screening will take place within sheltered parts of the quarry to reduce the likelihood of transport of dust via wind; • Dampen material during dry periods prior to crushing operation; • Crushing and screening plant will be used within its design capacity; and, • All plant and equipment will be subjected to routine preventative maintenance.
Material Handling • Materials will be dampened sufficiently during dry conditions; • Dampen conveyers where required from fixed sprays or mobile bowser; • Clearance of any spillage during extraction should be completed regularly to minimise accumulation of loose dry materials; and, • Minimisation of drop heights will be maintained.
Vehicle movements • Abrupt changes in direction will be avoided where possible; • Regular clearing, grading and maintenance of haul routes will be conducted; • Speed restrictions within and around the quarry (15 km/hr); • Vehicles will be evenly loaded to reduce the possibility of spillages;

Commitment
• Daily application of water to haul routes during dry conditions will be completed; • HGVs will pass through wheel wash onto hardstanding prior to leaving the Site; and, • Road sweepers will be utilised to maintain local roads on a need-to basis.
Climate
Mitigation measures will be introduced to avoid, reduce and replace carbon emissions associated with the Proposed Development. These measures will follow the mitigation hierarchy, which includes the following approaches:
Avoid: The avoidance of GHG emissions involves strategies to minimise emissions by avoiding or reducing activities that contribute to them, including: • Waste Management: Effective waste management practices, including recycling and composting programmes, to minimise landfill waste and associated methane emissions. **Reduce:** The reduction of GHG emissions focuses on implementing measures that minimise emissions during the Construction Phase. These include: • Plant and Operations: The Operational Phase will reduce the idling of the on-site plant when not in use. • Blasting Practices: Reduce electrical energy consumption by minimising the primary and secondary crusher energy requirements. **Replace:** The replacement approach involves substituting high-emission activities or materials with lower-emission alternatives. These include: • Site Equipment: Site equipment worn will be reused as far as practicable.
Noise and Vibration
The potential for noise arising from the development has three distinct phases - the Site Preparation Phase, Operational Phase and Rehabilitation Phase. The mitigation measures of the phases are distinctly different and therefore are discussed separately.

Site Preparation Phase
<u>Noise</u>
Based on the assessment conducted here, typical mitigation measures should be implemented as:
• Construction Phase works will be designed to avoid noisy work outside the hours of:
  ○ Monday to Friday 07:00 to 19:00; and,
  ○ Saturday 07:00 to 13:00.

Commitment
• Work occurring outside these hours will be subject to tighter construction stage noise limits, as per BS5228 (Section 11.2.2 of this EIAR); • Nomination of a responsible person to accept and respond to complaints; • Ensuring all plant and equipment is serviced and in good repair; • Avoidance of plant or equipment left idling; • Planning of works to ensure drop heights from equipment or during demolition are minimised to reduce noise generated; and, • Noise monitoring programme during construction phase works. <u>Vibration</u> • No mitigation required for the Site Preparation Phase relating to vibration control.
Operational Phase Plant operating hours will be from Monday to Friday, 08:00 to 18:00, and Saturday, 08:00 to 14:00. No quarrying activities will take place on Sundays or Public Holidays. The following mitigation measures will be put in place as part of ongoing operations on-site: • All plant (fixed and mobile) is maintained to a high standard to reduce any tonal or impulsive sounds; • All plant is throttled down or switched off when not in use; • Drop heights of material are minimised; • Rubber linings will be used on chutes and transfer points; • Where possible, plant and machinery will be enclosed or cladded; and, • Internal routes will be reduced in gradients and routed to minimise noise emissions from vehicles on-site. Air overpressure from a blast is difficult to control because of its variability. However, much can be done to reduce the effect. In line with best practice mitigation measures from vibration sources, good communication and public relations are a key factor in reducing any startle effects on residents. **Vibration** Operational stage vibration will arise during quarry face blast events. • Ensuring appropriate burden to avoid over or under-confinement of the charge; • Accurate setting out and drilling;

Commitment
• Appropriate charging; • Appropriate stemming with appropriate material such as sized gravel or stone chippings; • Using delay detonations to ensure smaller maximum instantons charges; • Using decked charges and in-hole delays; • Blast monitoring to enable adjustment of subsequent charges; • Blasting should occur between Monday to Friday, 09:00 to 17:00; • Communications should occur with all residences within 500m of the blast regarding the scheduling of the events; • Designing each blast to maximise its efficiency and reduce the transmission of vibration; and, • Avoiding the use of exposed detonating cord on the surface in order to minimise air overpressure. It will be the task of the competent blast engineer to take into consideration the current quarry face, the known geology and modern blasting best practices, to maximise the efficiency and thereby minimise energy loss through ground borne vibration to the surrounding environment.
Rehabilitation Phase <u>Noise</u> The Rehabilitation Phase will be temporary insofar as it will be at periodic intervals over the lifetime of the quarry. The Rehabilitation Phase will be limited to the operational times of 08:00 to 18:00, Monday to Friday and 08:00 to 14:00 on Saturdays. No works will occur on Sundays or Public Holidays. • All mobile plant will be maintained to a high standard to reduce any tonal or impulsive sounds; and, • All mobile plant will be throttled down or switched off when not in use. <u>Vibration</u> • No likely significant vibration impacts to sensitive receptors during the Rehabilitation Phase.
<u>Noise Monitoring</u> All blast events will be monitored at the nearest NSR to the blast for vibration and air overpressure. A ground borne vibration limit for peak particle velocity of 8mm/s measured in any of the three mutually orthogonal directions at the receiving location (at frequencies less than 40Hz) and an air overpressure limit of 125dB **linear** with a 95% confidence limit. General activities on-site will be acoustically monitored on an annual basis at a minimum of three locations, with a site-specific noise limit, measured at Noise Sensitive Receptor of:

Commitment
• Daytime $L_{Ar,1hr,}$ 55dB; and, • Night-time $L_{Aeq,1hr}$ 45dB. Any tonal or impulsive characteristics of the site-specific noise emissions during the day will accrue a 5dB weighting. No tonal or impulsive characteristics to site-specific noise emissions during the night-time period. 95% of all noise levels shall comply with the specified limit value, with no noise level exceeding the limit by more than 2dB. The extent and timing of the monitoring shall be agreed upon with the Local Authority in advance. The results of the monitoring shall be submitted to the Local Authority. Furthermore prior to any blast event, a public notification programme will be employed to ensure all residents within 500m of the blast are aware of the upcoming blast.
Landscape and Visual
The main mitigation by avoidance measure is the siting of the Proposed Development in a contained landscape context that avails of a high degree of existing screening in the form of existing vegetation and surrounding mature treelines. The Proposed Development is also contained in a landscape context already influenced by the extractive industry, which limits its potential to present as an incongruous development type. It is proposed to construct a ca. 3m height berm along the western and southern Site boundary. This earthen berm will be planted with a native woodland mix provided in the form of high canopy (dominants) species, low canopy (sub-dominant) species, understory and fringe (higher shrubs) species and understory and edge (lower shrub) species and will comprise of a mix of advanced nursery stock and whip planting of local provenance. The proposed plantings will be allowed to grow out to reach maturity and will soften and screen surrounding landscape and visual receptors as it matures. Proposed plantings will be allowed to grow out to reach maturity and will soften and screen surrounding landscape and visual receptors as it matures. Other landscape and visual mitigation measures relate to the retention of existing vegetation surrounding the Site to retain the existing landscape structure and screening in the immediate Site vicinity.
Cultural Heritage
The potential effect on the setting of structure No. 3, the former Rectory, should be mitigated by the construction of a landscaped screening mound on the western side of the quarry where it faces the structure. Due to the potential survival of previously unknown sub-surface archaeological deposits or finds within the Proposed Development in areas 2, 3, 4, 5 and 6 all soil-stripping in those areas should be monitored by a qualified archaeologist. Any archaeological material identified during monitoring should be preserved by record under licence from the National Monuments Service in advance of development
Material Assets – Traffic & Transport
Mitigation and Management • Additional passing bays and widening were identified as measures that will maintain the quality of infrastructure along the quarry haulage route.

Commitment
• Additional passing bays will be investigated to support the passing of two HGVs and developed in consultation with the Local Authority.
Monitoring However, should the Proposed Development be granted permission to proceed, monitoring of the surrounding road network's infrastructure will be regularly undertaken to assess if measures should be taken such as additional passing bays and widening that will maintain the quality of infrastructure along the quarry haulage route.

17 REFERENCES

[1] Wicklow County Council, “Wicklow County Council Planning Online,” [Online]. Available: https://www.eplanning.ie/WicklowCC/SearchTypes. [Accessed 15 11 2024].

[2] DoHLGH, “EIA Portal,” Department of Housing, Local Government and Heritage, 2023. [Online]. Available: https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=d7d5a3d48f104ecbb206e7e5f84b71f1.

[3] ABP, “An Bord Pleanála Map Viewer,” Ordnance Survey Ireland, 2023.

[4] Google, “Google Earth,” Google, 2023. [Online]. Available: https://earth.google.com/web/@52.22368799,-7.34433751,74.13843014a,1917.82823397d,35y,0h,0t,0r.

[5] WCC, “Wicklow County Development Plan 2022-2028,” Wicklow County Council, Wicklow, 2022.

[6] EPA, “Advice Notes on Current Practice (in the preparation of Environmental Impact Statements),” EPA, 2003.

[7] EPA, “Guidelines on the Information to be contained in Environmental Impact Statements,” Environmental Protection Agency, Dublin, 2002.

[8] European Commission, “Interpretation of Definitions of Project categories of annex I and II of the EIA Directive,” European Commission, 2015.

[9] European Commission, “EU Guidance on EIA: EIS Review,” European Commission, Luxembourg, 2001a.

[10] EPA, Guidelines on the Information to be contained in Environmental Impact Assessment Reports, Dublin: EPA, 2022.

[11] DeHPLG, “Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment,” Department of Housing, Planning and Local Government, 2018.

[12] DoEHLG, “Quarries and Ancillary Activities,” Department of Environment, Heritage and Local Government, Dublin, 2004.

[13] DoAHG, “Wildlife, Habitats & the Extractive Industry,” Department of Arts, Heritage and the Gaeltacht, Dublin, 2007.

[14] Department of Housing, Planning, Community and Local Government, "Implementation of Directive 2014/52/EU on the effects of certain public and private projects on the environment (EIA Directive)," DHPCLG, Dublin, 2017.

[15] Department of Housing, Planning, Community and Local Government, "Transposition of 2014 EIA Directive (2014/52/EU) in the Land-Use Planning and EPA Licensing System Key Issues Consultation Paper," DoHPCLG, Dublin, 2017.

[16] EPA, "Guidelines on the Information to be Contained in Environmental Impact Assessment Reports," Environmental Protection Agency, Dublin, 2022.

[17] Government of Ireland, "Project Ireland 2040," Gov.ie, 2018. [Online]. Available: https://www.gov.ie/en/campaigns/09022006-project-ireland-2040/. [Accessed 06 03 2023].

[18] Government of Ireland, "Project Ireland 2040 National Planning Framework," Department of Housing, Planning and Local Government, 2018.

[19] Government of Ireland, "National Development Plan 2021-2030," Government of Ireland, 2021.

[20] Irish Concrete Federation, "Essential Aggregates: Providing For Ireland's Needs to 2040," Irish Concrete Federation, 2018.

[21] EMRA, "Eastern and Midland Regional Spatial and Economic Strategy 2019-2031," Eastern Midland Regional Assembly, 2019.

[22] Institute of Public Health in Ireland (IPHI), "Health Impact Assessment Guidance: A Manual," IPHI, Dublin and Belfast, 2021.

[23] IEMA, "Health Impact Assessment in Planning," *Impact Assessment Outlook Journal,* vol. 8, no. Oct 2020, 2020.

[24] IEMA, "Health in Environmental Impact Assessment, A Primer for Proportionate Approach," IEMA, London, 2017.

[25] IEMA, "Effective Scoping of Human Health in Environmental Impact Assessment," IEMA, London, 2022.

[26] IEMA, "Determining Significance for Human Health in Environmental Impact Assessment," IEMA, 2022.

[27] B. C. T. Cave, B. Fischer-Bonde, S. Humbolt-Dachroeden, P. Martin-Olmedo, O. Mekel, R. Pyper, F. Silva and F. &. X. Y. Viliani, "Human Health: Ensuring a high level of protection. A reference paper on addressing Human Health in Environmental Impact Assessments," International Association for Impact Assessment and European Public Health Association, 2020.

[28] CSO, “Central Statistics Office,” 2016. [Online]. Available: https://www.cso.ie/en/releasesandpublications/ep/p-fss/farmstructuresurvey2016/da/ls/.

[29] Central Statistics Office, “Census,” CSO, 2023. [Online]. Available: https://www.cso.ie/en/census/. [Accessed 2024].

[30] CSO, “Central Statistics Office Labour Force,” 2022. [Online]. Available: https://www.cso.ie/en/releasesandpublications/ep/p-lfs/labourforcesurveyquarter22022/unemployment/#:~:text=The%20number%20of%20persons%20aged,See%20Table%209.1.. [Accessed 03 2023].

[31] Geological Survey Ireland (GSI), “GSI Spatial Resources Map & GIS Layers,” 2024. [Online]. Available: https://www.gsi.ie/en-ie/data-and-maps/Pages/default.aspx.

[32] Environment & Resource Management Ltd, “Environmental Impact Statement for Proposed Integrated Waste Management Facilities, Whitestown Lower, Co Wicklow,” 2004.

[33] M. Carolan, “Council must clean up appalling Wicklow dump within three years,” *The Irish Times,* pp. https://www.irishtimes.com/news/crime-and-law/courts/council-must-clean-up-appalling-wicklow-dump-within-three-years-1.4052620, 16 October 2019.

[34] Irish River Project, “Wicklow List of Quarries registered under S261,” 06 January 2022. [Online]. Available: https://irishriverproject.com/2022/01/06/wicklow-list-of-quarries-registered-under-s261-of-the-planning-development-act-2000/. [Accessed 2024].

[35] Casemine, “Brownfield Restoration [Ireland] Ltd v Wicklow County Council (Approved),” March 2023. [Online]. Available: https://www.casemine.com/judgement/uk/6423c59ed66f1c555c6461a4. [Accessed March 2024].

[36] EPA, “EPA Licence Details,” 29 April 2024. [Online]. Available: https://epawebapp.epa.ie/licences/lic_eDMS/090151b2808cfaa8.pdf. [Accessed May 2024].

[37] EPA, “LEAP,” November 2017. [Online]. Available: https://leap.epa.ie/licence-profile/W0181/compliance/sitevisit/31b0f037-58ec-e611-a4f6-0050568a69e2. [Accessed May 2024].

[38] Health and Safety Authority, “HSA Quarry Sector Resources,” HSA, [Online]. Available: https://www.hsa.ie/eng/Your_Industry/Quarrying/Quarries_in_Ireland/HSA_Quarry_Sector_Resources/. [Accessed February 2024].

[39] EU Safety and Health Commission for the Mining and other Extractive Industries, “Guidance on the Safe Use of Explosives in Quarries,” EU, 2001.

[40] NRA, "Guidelines for Assessment of Ecological Impacts of National Roads Schemes," National Roads Authority , 2009.

[41] CIEEM, "Guidelines for Ecological Impact Assessment in the UK and Ireland - Terrestrial, Freshwater, Coastal and Marine," Chartered Institute of Ecology and Environmental Management (CIEEM), Winchester, 2018.

[42] D. Latham, E. Jones and M. Fasham, "Chapter 23: Reptiles," in *Handbook of Biodiversity Methods: Survey, Evaluation and Monitoring*, Cambridge University Press, 2005, pp. 405-411.

[43] JNCC, "Herpetofauna Worker's Manual," Joint Nature Conservation Committee, 2003.

[44] JNCC, "Common Standards of Monitoring Guidance for Reptiles and Amphibians," Joint Nature Conservation Committee, 2004.

[45] D. Sewell, R. A. Griffiths, T. J. C. Beebee, J. Foster and J. W. Wilkinson, "Survey protocols for the British herpetofauna," 2013.

[46] Froglife, "Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10.," Froglife, Halesworth, 1999.

[47] J. A. Fossitt, A Guide to Habitats in Ireland, Dublin: The Heritage Council, 2000.

[48] M. F. Ú. C. E. J. M. M. D. S. S. M. &. W. M. Wyse Jackson, "Ireland Red List No. 10: Vascular Plants.," National Parks and Wildlife Service, 2016.

[49] G. Smith, P. O'Donoghue and K. &. D. E. O'Hara, "Best Practice and Guidance for Habitat Surveying and Mapping," Heritage Council, 2011.

[50] NRA, "Ecological Surveying Techniques for Protected Flora and Fauna," National Roads Authority.

[51] Scottish Badgers, "Surveying for Badgers: Good Practice Guidelines. Version 1," Scottish Badgers, 2018.

[52] S. Harris, P. Cresswell and D. Jefferies, "Surveying Badgers," The Mammal Society, London, 1989.

[53] NRA, "Guidelines for the Treatment of Bats during the Construction of National Road Schemes," National Roads Authority, Dublin, 2006.

[54] B. C. Trust, "Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)," The Bat Conservation Trust, London, 2016.

[55] McAney, K. et al., "A Conservation Plan for Irish Vesper Bats, Irish Wildlife Manual No.20," National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland, 2006.

[56] J. Hardey, H. Crick, C. Wernham, H. Riley, B. Etheridge and D. Thompson, Raptors: A Field Guide for Surveys and Monitoring, 2013.

[57] J. Ferguson-Lee, R. Castell and D. Leech, A Field Guide to Monitoring Nests, Norfolk, United Kingdom: British Trust for Ornithology, 2011.

[58] G. Gilbert, D. Gibbons and J. Evans, Bird Monitoring Methods, Exeter, United Kingdom: Pelagic Publishing, 2011.

[59] CIRIA, "C741- Environmental Good Practice on Site (4th edition)," 2015.

[60] NRA, "Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes," National Roads Authority, 2006.

[61] NRA, "Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads," National Roads Authority, 2010.

[62] NPWS, "National Parks and Wildlife Service," 2024. [Online]. Available: https://www.npws.ie.

[63] NBDC, "National Biodiversity Live Maps," 2025. [Online]. Available: http://maps.biodiversityireland.ie/. [Accessed 21 January 2025].

[64] EPA, "EPA Map Viewer," 2024. [Online]. Available: http://gis.epa.ie/EPAMaps/.

[65] Earth Science Partnership Ire. Ltd., "Environmental Report To Accompany a Planning Application For a Quarry Development Located at Deerpark, Donard, Co. Wicklow," 2021.

[66] C. Cardiff, "Donard Quarry, Co. Wicklow Raptor Survey 21/06/2022," Cian Cardiff (CC Ornithology and Thomas Cardiff), 2022.

[67] Statutory Instruments, "European Union (Invasive Alien Species) Regulations 2024," European Commission, 2024.

[68] G. Gilbert, A. Stanbury and L. Lewis, "Birds of Conservation Concern in Ireland 2020-2026," *Irish Birds,* no. 9, pp. 523-544, 2021.

[69] NPWS, "Red Lists," 2023. [Online]. Available: https://www.npws.ie/publications/red-lists. [Accessed 2023].

[70] Ireland, Government of, "Updated Draft Revised National Planning Framework," 2024.

[71] Wicklow County Council, "County Wicklow Heritage Plan 2017-2022," 2017.

[72] Wicklow County Council, "Draft County Wicklow Heritage Plan 2025-2029," 2024.

[73] Wicklow County Council, "County Wicklow Biodiversity Action Plan 2010-2015," The Heritage Council, 2010.

[74] Coillte, "South-East Five Year Forest Plan 2021-2025," 2021.

[75] EC, "Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of articles 6(3) and (4) of the Habitats Directive 92/43/EEC.," Luxembourg: Office for official publications of the European Communities, European Commission, 2002.

[76] DoEHLG, "Appropriate Assessment of Plans and Projects in Ireland, Guidance for Planning Authorities.," Department of Environment, Heritage and Local Government , 2009.

[77] OPR, "OPR Practice Note PN02: Environmental Impact Assessment Screening," Office of the Planning Regulator, Dublin, 2021.

[78] NBDC, "National Biodiversity Live Maps," 2024. [Online]. Available: http://maps.biodiversityireland.ie/.

[79] NRA, "Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes," National Roads Authority, Dublin, 2006.

[80] IGI, "Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements," Institute of Geologists Ireland , Ireland, 2013.

[81] EPA, "Environmental Management in the Extractive Industry (Non-Scheduled Minerals)," Environmental Protection Agency, Wexford, 2006.

[82] Institute of Environmental Management & Assessment, IEMA, "A New Perspective on Land and Soil in Environmental Impact Assessment," IEMA, 2022.

[83] "EPA Mapping," 2024. [Online]. Available: https://gis.epa.ie/EPAMaps/. [Accessed 2024].

[84] "Construction Code of Practice for the Sustainable Use of Soils on Construction Sites," Department for Environment Food and Rural Affairs (DEFRA), London, 2009.

[85] European Parliament, "EU Water Framework Directive (WFD) - Directive 2000/60/EC," European Union, 2000.

[86] Government of Ireland, "River Basin Management Plan 2018 - 2021," Government of Ireland, 2018.

[87] Government of Ireland, “Draft River Basin Management Plan 2022 - 2027,” Government of Ireland, 2021.

[88] CIRIA C532, “Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors,” 2001.

[89] Department of Environment, Heritage and Local Government, “Quarries and Ancillary Activities - Guidance for Authorities,” 2004.

[90] GSI, “GSI Spatial Resources,” Geological Survey of Ireland, 2018. [Online]. Available: http://dcenr.maps.arcgis.com/apps/MapSeries/index.html. [Accessed July 2016].

[91] EPA , “Catchments.ie,” [Online]. Available: https://www.catchments.ie/. [Accessed 2024].

[92] OPW, “National Flood Hazard,” Office of Public Works, [Online]. Available: http://www.floodmaps.ie/View/Default.aspx. [Accessed 2024].

[93] EPA, “Water Framework Directive - Recharge and Groundwater Vulnerability,” EPA, 2008.

[94] EPA, “Environmental Management Guidelines, Environmental Management in the Extractive Industry (Non-Scheduled Minerals),” Environmental Protection Agency, Wexford, 2006.

[95] EPA, “By-product Notifications Register,” 2023. [Online]. Available: https://www.epa.ie/byproduct/#/. [Accessed March 2023].

[96] IAQM, “Guidance on the Assessment of Mineral Dust Impacts for Planning,” Institute of Air Quality Management, London, 2016.

[97] Statutory Instruments, “S.I No. 477/2011 - European Communities (Bird and Natural Habitats) Regulations 2011,” European Commission, 2011.

[98] EPA, “Air Quality in Ireland 2021 - Indicators of Air Quality,” Environmental Protection Agency, Wexford, 2022.

[99] EPA, “Air Quality in Ireland 2022,” EPA, Wexford, 2023.

[100] German Government , “Technical Instructions on Auir Quality Control - TA Luft,” German Government, 2002 (as amended).

[101] EPA, “Air Dispersion Modelling from Industrial Installations Guidance Note (AG4).,” Johnstown Castle Estate., Wexford, Ireland, 2019a.

[102] TII, “Air Quality Assessment for Specified Infrastructure Projects - Overarching Technical Document,” Transport Infrastructure of Ireland, Dublin, 2022.

[103] DCCAE, "Clean Air Strategy Public Consultation," Department of Communications, Climate Actions and Environment, Dublin, 2023.

[104] IEMA, "Assessing Greenhouse Gas Emissions and Evaluating their Significance," Institute for Environmental Management and Assessment, Dartford, 2022.

[105] IAQM, "Guidance on the Assessment of Dust from Demolition and Constriction," 2016.

[106] IAQM, "Guidance on the Assessment of Mineral Dust Impacts for Planning," Institute of Air Quality Management, London, 2016.

[107] WCC, "Climate Adaption Strategy," Wicklow County Council, Wicklow, 2019.

[108] Wicklow County Council , "Summary Report," Wicklow County Council , 2023.

[109] Wicklow County Council , "Wicklow County Council Draft Climate Action Plan 2024 – 2029," Wicklow County Council , Wicklow, 2023.

[110] IPCC, "Refinement for Guidelines for National Greenhouse Gas inventories," Intergovernmental Panel on Climate Change, Geneva, 2019.

[111] ISO, "ISO 14064-1 Part 1: Specification with guidance at the organisation level for quantification and reporting of greenhouse gas emissions and removals," International Standards Organisation, Geneva, 2018.

[112] EC, "Climate Adapt," European Commission , [Online]. Available: https://climate-adapt.eea.europa.eu/#t-countries. [Accessed 16 08 2023].

[113] EC, "European Climate Data Explorer," European Comission, [Online]. Available: https://climate-adapt.eea.europa.eu/en/knowledge/european-climate-data-explorer. [Accessed 16 08 2023].

[114] EC, "Copernicus Climate Change Service," European Comission , [Online]. Available: https://climate.copernicus.eu/. [Accessed 16 08 2023].

[115] EPA, "Climate Ireland," Environmental Protection Agency , Cork , 2023.

[116] GFDRR, "Think Hazard," Global Facility for Disaster Reduction and Recovery, 30 June 2020. [Online]. Available: https://thinkhazard.org/en/about. [Accessed 16 February 2023].

[117] DCCAE, "Climate Action Plan 2023," Department of Communication, Climate Action and Environment, Dublin, 2022.

[118] TII, "Carbon Tool for Road and Light Rail Projects: User Guidance Documents," Transport Infrastructure of Ireland, Dublin, 2022.

[119] DCCAE, “National Adaption Framework, Planning for a Climate Resilient Ireland,” Department of Communications, Climate Action and Environment, Dublin, 2018.

[120] GOI, “Technical Annex B CLimate Change Risk Assessment,” Government of Ireland , Dublin , 2023 .

[121] COP 21, “The Paris Climate Agreement,” in *COP 21*, Paris, 2015.

[122] DCCAE, “Climate Action Plan 2024,” Department of Communication, Climate Action and Environment, Dublin, 2023.

[123] IPCC, “Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change,” International Panel on Climate Change, Geneva, 2022.

[124] Met Eireann, “Ireland's Climate Averages 1991-2020,” Met Eireann, Dublin, 2023.

[125] EPA, “Irelands Climate Status Report,” Environmental Protection Agency, 2021, 2021.

[126] DCCAE, “Sectoral Emissions Ceilings Report,” Department of Environmental, Climate and Communications, Dublin, 2022.

[127] NSSGA, “The Aggregate Industry: Greenhouse Gases: Low Emissions, High Resiliency,” National Stone Sand and Gravel Association, 2021.

[128] UK Government, “Cement, Lime and Minerals: Examples your adapting to cliamte change risk assessment,” UK Government, London, 2o023.

[129] EC, “Global Wildfire Information System,” European Comission, [Online]. Available: https://gwis.jrc.ec.europa.eu/apps/gwis_current_situation/index.html. [Accessed 16 09 2023].

[130] ICF, “Environmental Code,” 2005. [Online]. Available: http://www.irishconcrete.ie/wp-content/uploads/2017/01/Environmental-Code.pdf.

[131] BSI, “BS5228-1:2009+A1:2014 Code of Practice for noise and vibration control on construction and open sites. Noise,” British Standards Authority , London, 2008.

[132] Statutory Instrument , “S.I. 140/2006 Environmental Noise Regulations,” Government of Ireland, Dublin, 2006.

[133] ANC, “ANC Guidelines: Environmental Noise Measurement Guide (Green Book),” Association of Noise Consultants, Suffolk, 2013.

[134] British Standard, “BS4142 2014: Methods for rating and assessing industrial and commercial sound,” British Standard, London, 2014.

[135] IEMA, "Guidelines for Environmental Noise Impact Assessment," Institute of Environmental Management & Assessment, Lincoln, November 2014.

[136] ISO, Acoustics -- Description, measurement and assessment of environmental noise -- Part 1: Basic quantities and assessment procedures, International Organization for Standarization, 2016.

[137] ISO, Acoustics -- Description, measurement and assessment of environmental noise -- Part 2: Determination of sound pressure levels, International Organization for Standardization, 2017.

[138] NRA, "Guidelines for the Treatment of Noise and Vibration in National Road Schemes," National Roads Authority , 2004.

[139] NRA, "Good Practice Guidance for the Treatment of Noise During the Planning of National Road Schemes," National Roads Authority, Dublin, March 2014.

[140] B. Smith, R. J. Peters and S. Owen, Acoustics and Noise Control 2nd Edition, London: Prentice Hall, 1996.

[141] WHO, "Night noise guidelines for Europe," World Health Organization, Copenhagen, 2009.

[142] WHO, Guidelines or Community Noise, Geneva: World Health Organization , 1999.

[143] Wicklow Council, Noise Action Plan, WCC, 2018-2023.

[144] ALSF, Sustainable Aggregates Theme 1 - Reducing the environmental effect of aggregate quarrying: dust, noise and vibration, London: Aggregate Levy Sustainability Fund.

[145] EPA, "Air Quality in Ireland 2017," Environmental Protection Agency, Wexford, 2018.

[146] BSI, BS 5228-2:2009 Code of practice for noise and vibration control on construction and open sites - Part 2: Vibration, London: British Standards , 2009.

[147] Teagasc, "Irish Soils Information System," EPA, [Online]. Available: http://gis.teagasc.ie/soils/. [Accessed 13 07 2021].

[148] P. MacCotter, Medieval Ireland, Dublin: Four Courts Press, 2014.

[149] H. a. t. G. Department of Culture, "Historic Enviornment Viewer of the Department of Culture, Heritage and the Gaeltacht," Department of Culture, Heritage and the Gaeltacht, [Online]. Available: http://webgis.archaeology.ie/historicenvironment/. [Accessed 2021 07 15].

[150] H. a. t. G. Department of Culture, "Historic Environment Viewer of the Department of Culture, Heritage and the Gaeltacht," Department of Culture, Heritage and the

Gaeltacht, [Online]. Available: http://webgis.archaeology.ie/historicenvironment/. [Accessed 19 07 2021].

[151] F. &. S. n. G. (. C. U. a. T. P. Branch, "The Placenames Database of Ireland," Department of Culture, Heritage and the Gaeltacht, [Online]. Available: www.logainm,ie. [Accessed 2020 05 05].

[152] P. Harbison, The axes of the Early Bronze Age in Ireland. Prähistorische Bronzefunde, abteilung IX, band 1., Munich: Beck, 1969.

[153] G. Eogan, Hoards of the Irish Later Bronze Age, Dublin, 1983.

[154] G. Eogan, The Socketed Bronze Axes in Ireland. Prähistorische Bronzefunde, abteilung IX, band 22., Stuttgart: Franz Steiner Verlag, 2000.

[155] R. Kavanagh, "A reconsideration of razors in the Irish earlier Bronze Age," *Journal of the Royal Society of Antiquaries 121,* pp. 77-104, 1991.

[156] B. O'Riordain and J. Waddell , The Funerary Bowls and vases of the Irish Bronze Age, galway, 1993.

[157] B. Raftery, La Tène in Ireland, Marburg: Vorgeschichtlichen Seminars, 1984.

[158] " Database of Irish Excavation Reports," [Online]. Available: https://excavations.ie/. [Accessed 20 07 2023].

[159] TII, "Traffic and Transport Assessment Guidelines," Transport Infrastructure Ireland, Dublin, 2014.

[160] TII, "Project Appraisal Guidelines for National Roads Unit 5.3, Travel Demand Projections," Traffic Infrastructure Ireland, Dublin, 2016.

[161] TII, "Project Appraisal Guidelines for National Roads Unit 16.1 - Expansion Factors for Short Period Traffic Counts," TII, October 2016. [Online]. Available: https://www.tiipublications.ie/library/PE-PAG-02039-01.pdf. [Accessed 21 03 2024].

[162] Traffinomics, "Traffic Surveys," Traffinomics, [Online]. Available: http://traffinomics.ie/traffic-surveys/. [Accessed 21 03 2024].

[163] TII, "Rural Road Link Design," TII, April 2017. [Online]. Available: https://www.tiipublications.ie/library/DN-GEO-03031-10.pdf. [Accessed 21 03 2024].

[164] TII, "Geometric Design of Junctions (priority junctions, direct accesses, roundabouts, grade seperated and compact grade seperated junctions)," Transport Infrastructure Ireland, Dublin, 2017.

[165] ICF, "Environmental Code - Second Edition," Irish Concrete Federation, Dublin, 2005.

[166] Landscape Institute, “Guidelines for Landscape and Visual Impact Assessment,” Landscape Institute and the Institue of Environment Managment and Assessment, London, 2013.

[167] GeoDirectory, “Geodirectory,” GeoDirectory, [Online]. Available: https://mygeoaddress-online.ie/#/. [Accessed 20 01 2025].