May 2025

Environmental Impact Assessment Report ('EIAR') – Volume 2

Proposed Whitestown Sand & Gravel Quarry

On behalf of

Mr. James Metcalfe & Mr. Thomas Metcalfe

Whitestown Lower, Co. Wicklow

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Form ES - 04

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Environmental Impact Assessment Report ('EIAR') – Volume 2

Proposed Whitestown Sand & Gravel Quarry

Mr. James Metcalfe & Mr. Thomas Metcalfe

Whitestown Lower, Co. Wicklow

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1 INTRODUCTION

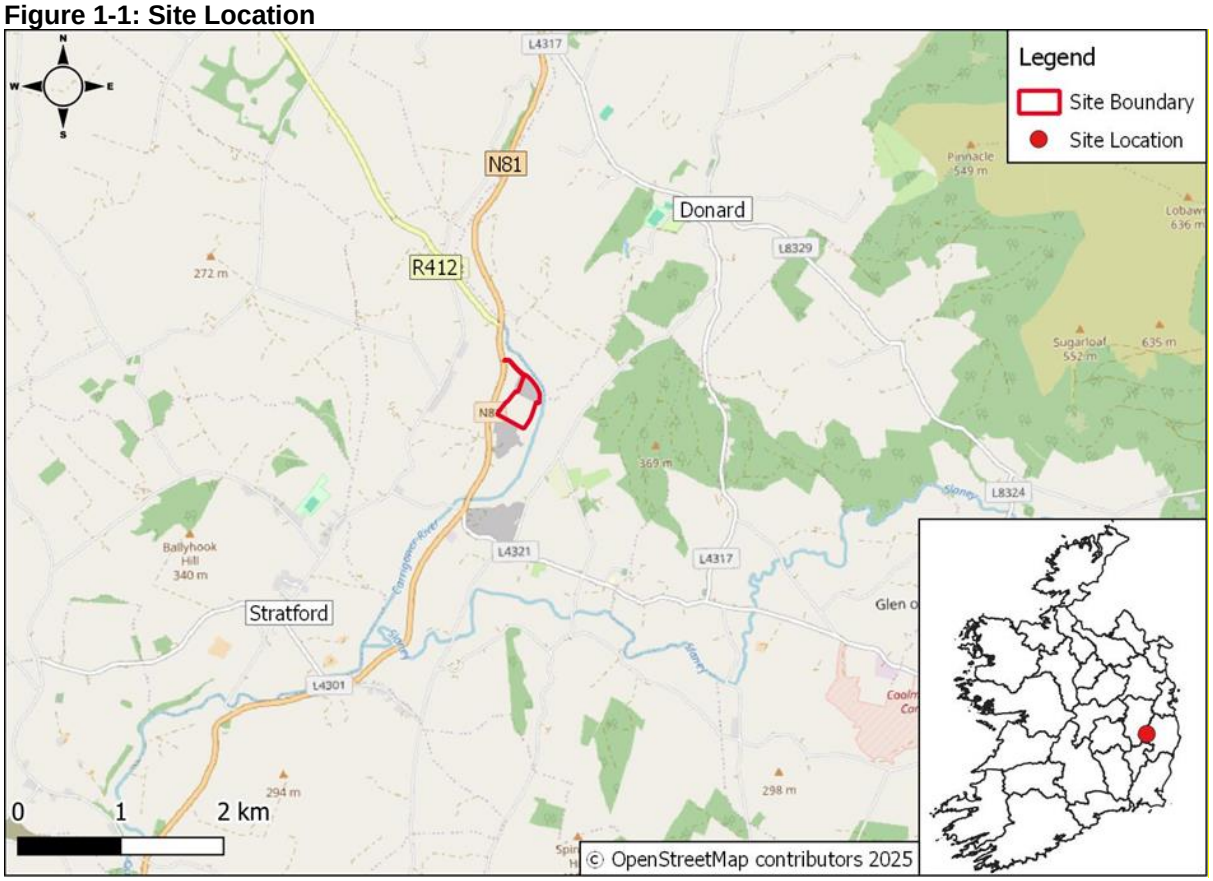
Malone O'Regan Environmental ('MOR Environmental') has been commissioned by Mr James Metcalfe and Mr Thomas Metcalfe ('the Applicants') to prepare an Environmental Impact Assessment Report ('EIAR') in support of a planning application for a proposed development in Whitestown, County Wicklow, to be submitted to Wicklow County Council ('WCC').

This EIAR assesses the potential environmental effects of a proposed sand and gravel extraction and processing development. The extraction lands are situated adjacent to the south of a former sand and gravel pit, which extends into undeveloped agricultural land. The proposal comprises the extraction, processing and temporary storage of aggregates—primarily sand and gravel—along with the continued use of existing on-site infrastructure. The existing development will provide key infrastructure, such as access to the N81, site office, weighbridge, wheel wash and on-site well. Restoration works will also be undertaken within the footprint of the former sand and gravel pit. Together, these elements are referred to hereafter as the Proposed Development.

A portion of the Proposed Development, specifically the area corresponding to the former sand and gravel pit, is currently authorised for use under a Waste Facility Permit ('WFP') (Register Ref. WFP-WW-21-0067-01), granted planning permission under application 20/1117 to Mr. Joseph O'Neill on 5th July 2021.

The Proposed Development covers a total area of circa ('ca.') 11.2 hectares ('ha'), which includes the proposed 7.75ha extension of the former sand and gravel pit within the townland of Whitestown Lower, County Wicklow (Ordnance Survey Ireland Grid Reference ITM 691307 695854) ('the Site'). The Site is situated ca. 2.76km northeast of Stratford town centre and 2.28km southwest of Donard town centre. Refer to Figure 1-1 for the redline boundary of the application Site.

Figure 1-1: Site Location



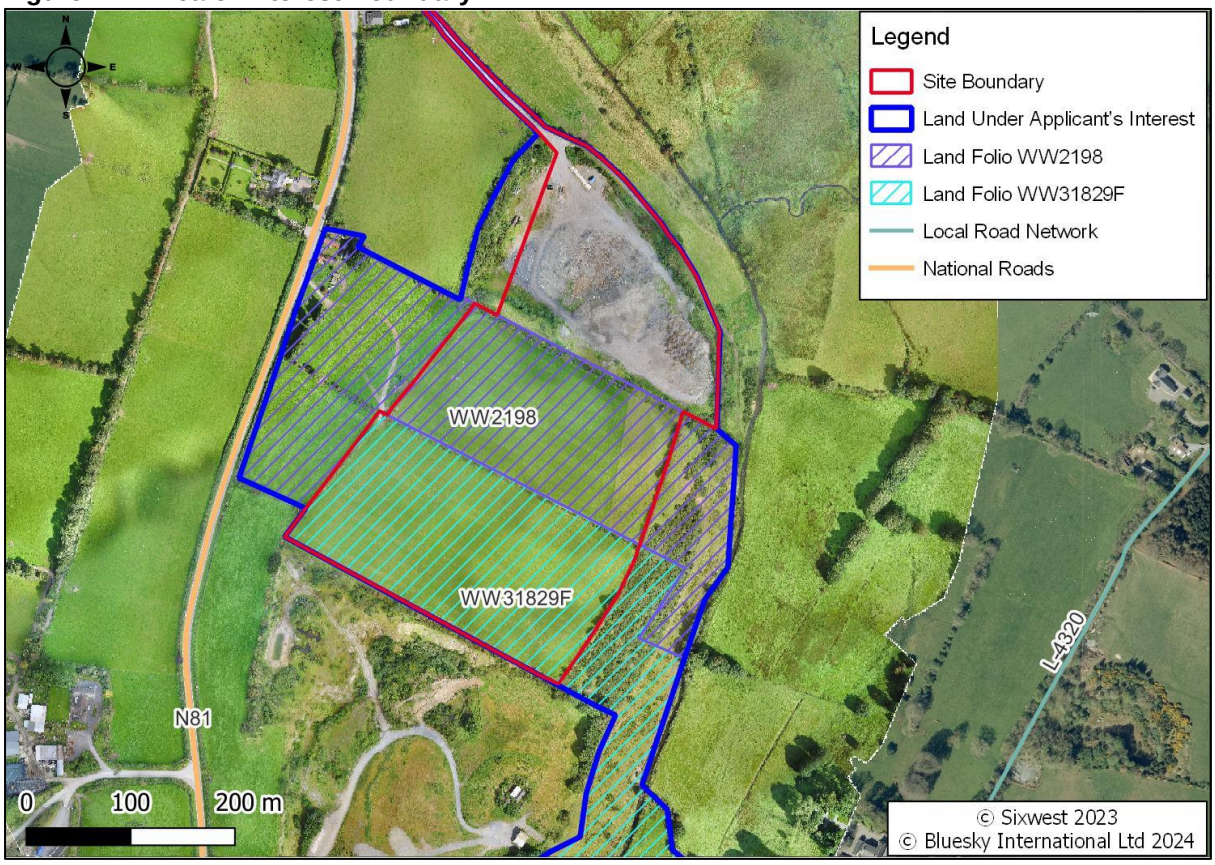
1.1 Site Description and Layout

The current landholding (Figure 1-2 below) in the Site's northern portion was previously used for aggregate extraction. After extraction operations ceased, planning permission (Planning Ref. 20/1117) was granted to restore 2.73ha of the former sand and gravel pit using imported inert soils and stone, while an additional 0.21ha is to be restored with site-won materials.

The Proposed Development seeks to extend the former sand and gravel pit into adjacent agricultural land to the south, with a total Site area of ca. 11.2ha. The 7.75ha extraction area lies within Folios WW2198 and WW31829F, currently in agricultural use and separated by a hedgerow. Both parcels are under the ownership of the Applicants. As this extension area has no known history of prior development, it is classified as "Greenfield" land. The Proposed Development will extend from the historic pit along established haul routes, connecting to the existing site entrance.

The ongoing restoration programme at the former sand and gravel pit, within the Proposed Development, was authorised by the Environmental Section of the WCC, permitting the importation of waste soils under WFP-WW-21-0067-01, granted to Herbie Stephenson Ltd. on 24th August 2021, with an expiry date of 23rd August 2026.

Figure 1-2: Area of Interest Boundary



1.2 Description of the Setting of the Proposed Development

The Site is located outside the Local Area Plan for Donard Town, and therefore, no specific zoning is identified for the Site. The Site is located within an area where the predominant land use is agricultural. However, historic extractions are evident to the south, while a large timber manufacturing facility is located to the west of the N81.

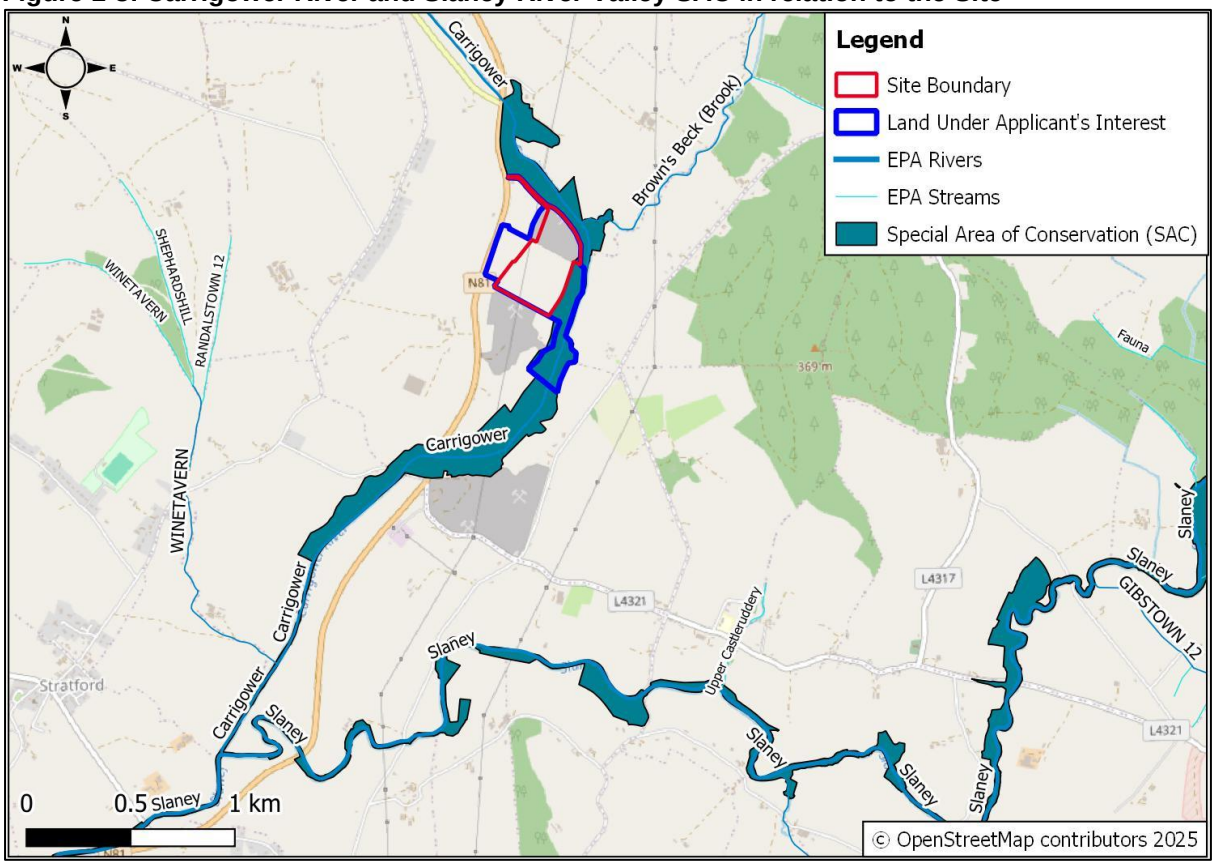
The Site is bounded by and accessed via the N81 road to the west, with a ca. 250m long access road connecting the former sand and gravel pit entrance to the N81 road. The northern

boundary of the Site is adjacent to the Slaney River Valley Special Area of Conservation ('SAC'), with an eastern section of the Site overlapping the SAC. Its southern boundary is adjacent to an unauthorised landfill which was granted a waste license (W0204-01) in April 2006 for the activities associated with the cleanup and remediation of an unauthorised landfill of ca. 240,000 tonnes ('t') of mixed construction and commercial waste emplaced during the 1970s to 2001.

The Carrigower River is located ca. 40m from the northeast boundary of the Site, which flows in a northeast to southwest direction. The Brown's Beck (Brook) River is located ca. 50m northeast of the Site, which flows in a northeast to southwest direction and joins the Carrigower River at ca. 40m from the Site's northeastern boundary. The Winetavern River, located ca. 1.5km southwest of the Site, flows north to southeast before merging into the Carrigower River ca. 2km southwest of the Site. The Slaney River is located ca. 1.6km south of the Site, flows east to west-southwest. The Carrigower River ultimately becomes part of the Slaney River, ca. 2.6km southwest of the Site. Refer to Figure 1-3 below for context.

There are ca. six residential and business properties spread out within 350m of the Site and linear one-off residential dwellings in Whitestown Lower, located ca. 1km west of the Site.

Figure 1-3: Carrigower River and Slaney River Valley SAC in relation to the Site

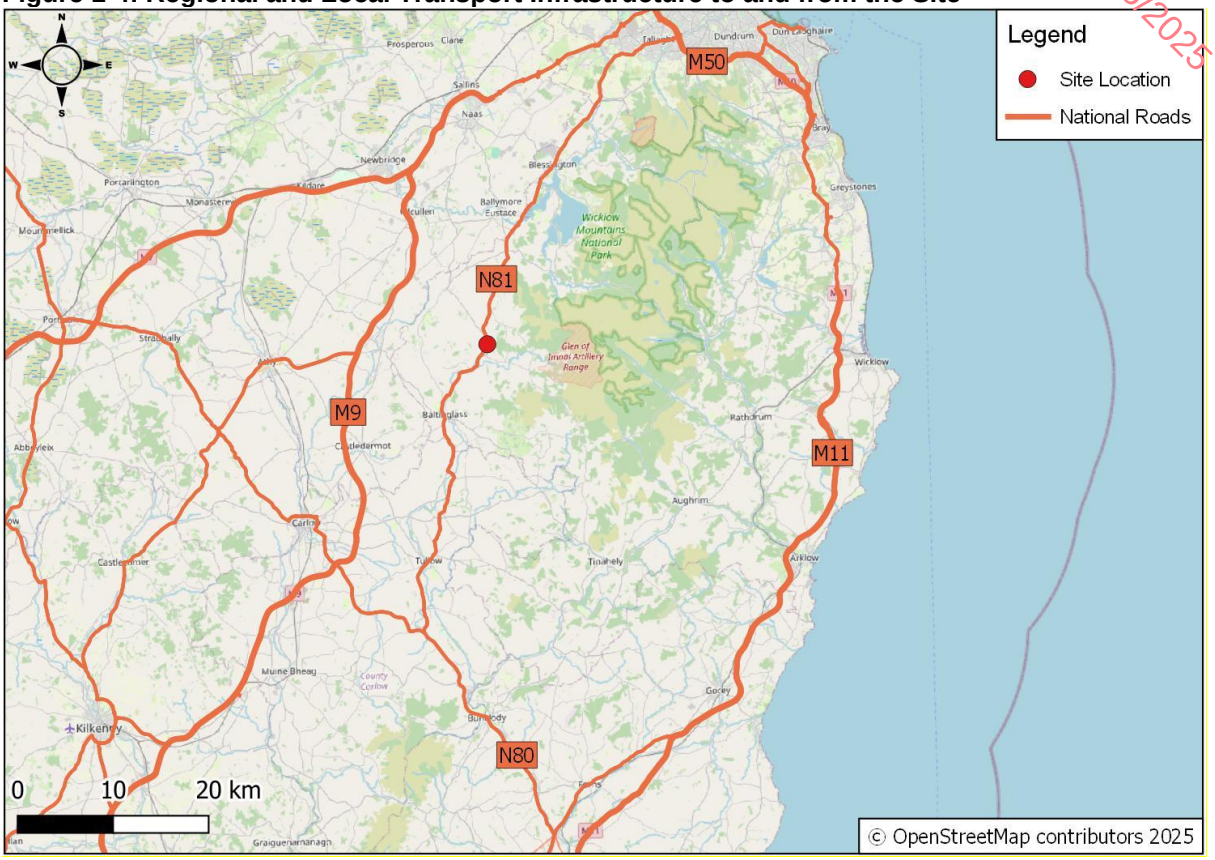


1.3 Description of Local Transport Infrastructure

The Site is well served by existing transport infrastructure, benefiting from a priority-controlled T-junction with the N81, a national secondary road. The N81 runs from the M50 motorway to Tullow, County Carlow, in a north-south direction and continues for another 8km past Tullow, terminating at the village of Closh, where it intersects with the N80. The road is a dual carriageway between the M50 and west of Tallaght Bypass or Blessington Road and intersects the M50 at junction 11.

The Site's location is highly advantageous, as the N81 national road provides strong north-south connectivity. It links to key motorways, including the M50 to the north and the M9 and M11 to the south via the N80, facilitating the efficient transport of aggregates by Heavy Good Vehicles ('HGVs') from the Site to other regions, ensuring both regional and national access.

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



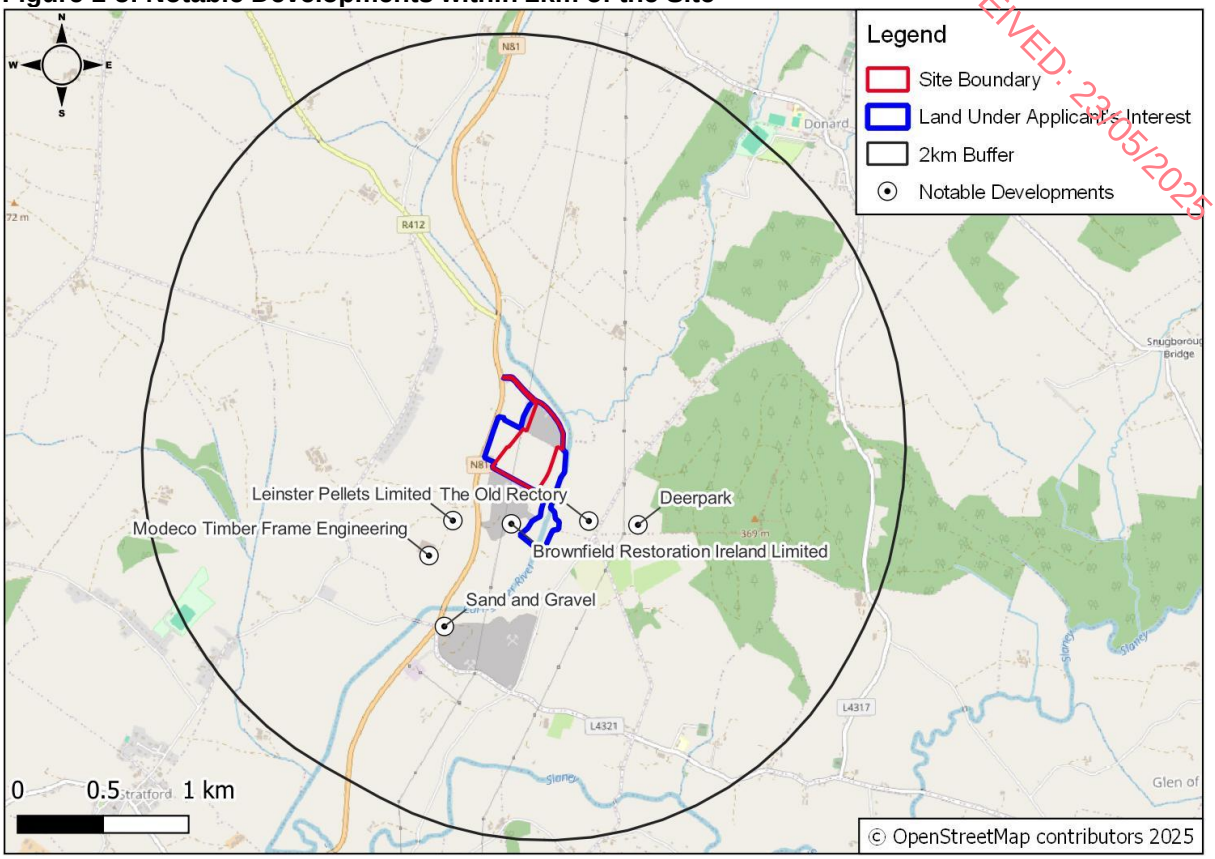
1.4 Notable Developments in the Area

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 cumulative and in-combination effects.

A review of developments within 2km of the Site has been undertaken, utilising the WCC Planning Portal [1], the Environmental Impact Assessment ('EIA') portal [2], the An Bord Pleanála ('ABP') Portal [3], aerial imagery from google earth [4], EPA Map Viewer [5] and the Wicklow County Development Plan 2022-2028 ('CDP') [6].

The majority of proposed and existing developments within the 2km study of the Site were residential dwellings or small-scale projects. Five large-scale developments have been identified within the study area, as shown in Figure 1-5 below. These are further discussed in Chapter 2.

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



1.5 Applicant

The Applicants, Mr. James Metcalfe of Newtown, Donard, Co. Wicklow, and Mr. Thomas Metcalfe of Ballylion, Donard, Co. Wicklow, own the land detailed in Folios WW2198 and WW31829F. They have lived and farmed on these lands for over twenty years, giving them a deep understanding of the site's history and surroundings. This long-term local engagement, combined with their extensive industry experience, uniquely positions them to successfully carry out the Proposed Development.

Their expertise in the aggregates and extraction business is further reinforced by a strong family background in the industry. Their uncle, Nicholas O'Toole, operated a successful business that supplied aggregates from local sand pits and quarries to farmers and construction sites throughout the area. By working closely with him for many years, both Tom and James gained invaluable experience and developed excellent customer relationships, further demonstrating their capability to manage and execute projects effectively in this sector.

1.6 Project Background

The former sand and gravel pit, located within the northern portion of the Site, was previously used for the extraction of aggregate. It was granted planning permission on appeal (Planning Ref. 27/5158916) by ABP on 30th November 1982, after WCC initially refused it due to traffic concerns. Aerial images from 1995, 2000 and 2005 confirmed that extraction remained within the permitted boundary (ca. 2.6ha) until an unauthorised extension of ca. 0.4ha occurred between 2000 and 2005. The permitted sand and gravel pit was legally authorised. Following the closure of the sand and gravel pit, planning permissions were submitted by Joseph O'Neill for restoration works limited to the originally permitted excavated area.

Joseph O'Neill initially submitted a planning application (Planning Ref. 20/1067) in October 2020 for a soil recovery facility, but this application was incomplete. A revised application

(Planning Ref. 20/1117) was submitted in November 2020, seeking permission for the importation of inert soil and stones as infill to restore 2.73ha of the former sand and gravel pit. The proposal included the importation of 23,000t per annum (totalling 115,000t) and restoring an additional 0.21ha using site-won materials. The development also included associated civil works, site infrastructure, a wheel wash and access road for a five-year period. The application was granted in July 2021.

The restoration programme is ongoing and is permitted by the Environmental Section of WCC for the importation of soils under WFP-WW-21-0067-01, granted to Herbie Stephenson Ltd. on 24th August 2021, with an expiration date of 23rd August 2026.

According to the Environmental Impact Assessment ('EIA') screening report submitted with the application, it was noted that no extraction below the groundwater table had occurred, and no groundwater monitoring was submitted.

To the south of the Site, Brownfield Restoration Ltd. applied for planning permission (Planning Ref. 052224) for an integrated waste management facility. The application proposed the establishment of various waste management infrastructure, including a landfill facility for mixed waste (commercial, industrial, construction and household waste) and a composting facility to process both previously deposited and imported waste for commercial recovery and disposal. The application was submitted to the Environmental Protection Agency ('EPA') and was granted permission to Brownfield Restoration Ltd. under EPA Waste License No. W0204-01. The license covers activities related to the cleanup and remediation of an unauthorised landfill containing an estimated 240,000t of mixed construction and commercial waste, deposited between the 1970s and 2001.

1.7 Scope of the Proposed Development

The Applicants propose to extend the former sand and gravel pit lands, owned by Joseph O'Neill, to the south to access their adjoining landholding for the extraction and temporary storage of aggregates, including sand and gravel. It is important to note that the Proposed Development is an extension of a former sand and gravel pit, which currently operates under a WFP within the townland of Whitestown Lower, County Wicklow. This WFP site will provide key infrastructure, including access to the N81, a site office, a weighbridge, a wheel wash and a on-site well. Additionally, soils removed from the opening stage of the Proposed Development will be used to reduce the slope elevation currently present within Mr. O'Neill's landholding and provide suitable materials of site-won materials to finalise the restoration within the WFP lands, which lie within the SAC boundary.

The Proposed Development will include the extraction, processing (i.e. crushing, screening, & washing) and storage, temporarily on-site, of aggregates, extending the former sand and gravel pit into lands to the south. It is estimated that the Proposed Development has a maximum potential output of ca. 275,000t of material annually.

The former sand and gravel pit currently employs 4-5 staff members, including on-site personnel, hauliers, and maintenance workers, with no expected increase in workforce.

The Proposed Development extraction will be down to a level of 143 metres Above Ordnance Datum ('mAOD'), this elevation is consistent with the ground levels to the north and south. No extraction is planned to occur below the groundwater table.

The Proposed Development will include creating boundary hedgerows and enhancing existing hedgerows with the native species mix, removing a portion of intervening hedgerows and ridge between the former sand and gravel pit and the extension area within the Proposed Development, as well as removing the hedgerow between Folio WW2198 and WW31829F (refer to Chapter 6 - Biodiversity).

The proposed works will include:

- Stripping of topsoil and stockpiling for future use;
- Short-term storage of graded aggregate in stockpiles;
- The installation of a shed, concrete plinth, oil / water separator, wash plant, mobile crusher and screening and associated settlement ponds;
- The use of front loader(s) and mobile screening plant;
- The creation and planting up of hedgerow boundaries;
- The extraction of sand and gravel to produce aggregates within the Proposed Development's site boundary.

The Proposed Development has an estimated reserve of ca. 1,140,762m^3 of aggregates or ca. 2,053,372t (using a conversion factor of 1.8) with a proposed extraction area of ca. 7.75ha. Additionally, this area contains ca. 23,250m$^{3.}$ of topsoil at a depth of ca.0.30m. If these lands were extracted at 275,000t per annum, it would take ca. 7.5 years to complete. However, this maximum extraction rate is entirely dependent on market forces, which could reduce at any time. As such, to allow for any such reduction in extraction rate, the Applicants are applying for a 20-year permission, including restoration following final excavations.

The Site's rehabilitation after operations have ceased will provide agricultural grasslands, a wetland area and replacement hedgerow planting. All imported material for the restoration will comply with the National By-Product Criteria in accordance with Regulation 27 of the European Communities (Waste Directive) Regulations [7]. Only materials that meet these criteria will be accepted for use on-site to ensure compliance with environmental and regulatory standards. The full restoration plan is presented in Appendix 6-1, with details provided in Section 3.3.6 below.

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;
- EPA Advice notes on current practice in the preparation of Environmental Impact Statements, 2003 [8];
- EPA Guidelines on the information to be contained in Environmental Impact Statements [9];
- Circular letter PL 1/2017; Implementation of Directive 2014/52/EU on the effects of certain public and private projects on the environment (EIA Directive) - Advice on Administrative Provisions in Advance of Transposition; issued by the Department of Housing, Planning, Community and Local Government, dated 15 May 2017);
- European Commission Guidance on the Preparation of the Environmental Impact Assessment Report [10]; and,
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment, 2018 [11].

1.8.1 EIA Amendment 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 European Union ('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[1] 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;

- The preparation of an environmental impact assessment report by the developer;
- The carrying out of a consultation;
- 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;
- 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,
- The integration of the competent authority's reasoned conclusion into its decision.

An EIAR document is produced as the 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 it's specific characteristics.

1.8.2 Assessment under Schedule 5 (Mandatory EIA)

The relevant classes of developments (with regards to the Proposed Development) 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 applicable activity class for the Proposed Development, which involves the extension of the former sand and gravel pit southward to access an adjoining landholding for the extraction, processing and temporary storage of aggregates (including sand and gravel) over ca. 7.75ha,

[1] Regulation 21, 67(d) and 69(e) came into effect on the 1st January 2019

falls under Class 2 (Extractive Industry), Paragraph (b) of Schedule 5, Part 2 of the Regulations. This class is defined as follows:

2. Extractive Industry

(b) Extraction of stone, gravel, sand, or clay, where the area of extraction would be greater than 5ha.

As the extraction area for the Proposed Development (7.75ha) exceeds the 5ha threshold set out under Item 2(b), Part 2, Schedule 5, it meets the criteria for a mandatory EIA under the Planning and Development Regulations.

1.8.3 Scope of the EIAR

In accordance with the EPA Guidelines 2022 [12] the following attributes of the receiving environment and their interactions are addressed within this EIAR:

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

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	
Chapter 1- 4	Chapters 1-4 provide an introduction to the Proposed Development, describes the Proposed Development, the need for the Proposed Development and the alternatives considered.
Chapters 5-14	Chapters 5-15 comprise of the assessment of predicted environmental impacts, together with an evaluation of their significance and a description of any mitigation measures proposed to minimise impacts. It also takes into account the interactions between the various environmental topics. Chapters 5-15 generally follows the structure set out below: • A brief introduction to the chapter;

Title	Description
	• An outline of the methodology employed; • A description of the receiving existing environment ('baseline') relevant to the environmental topic under consideration; • A description of the characteristics and predicted impacts 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 impacts identified; • A description of the residual impact of the Proposed Development. Residual impacts are the remaining impacts 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	
Appendix	Relevant topic specific technical documentation supporting the EIAR are contained within the Appendix and presented as a separate Volume of the EIAR (Volume 3).

1.9 Methodology

1.9.1 Assessment of Effects – Evaluation Criteria

The assessment of effects has been undertaken in accordance with best practice, legislation and guidance notes, as listed in Section 1.9. 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.

The criteria for determining the significance of impacts and the effects are set out in Figure 1-6 below, taken from EPA Guidance, Guidelines on the Information to be contained in an Environmental Impact Assessment Report [12]. Definitions of impact, 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 1-6: Description of the Environmental Effects

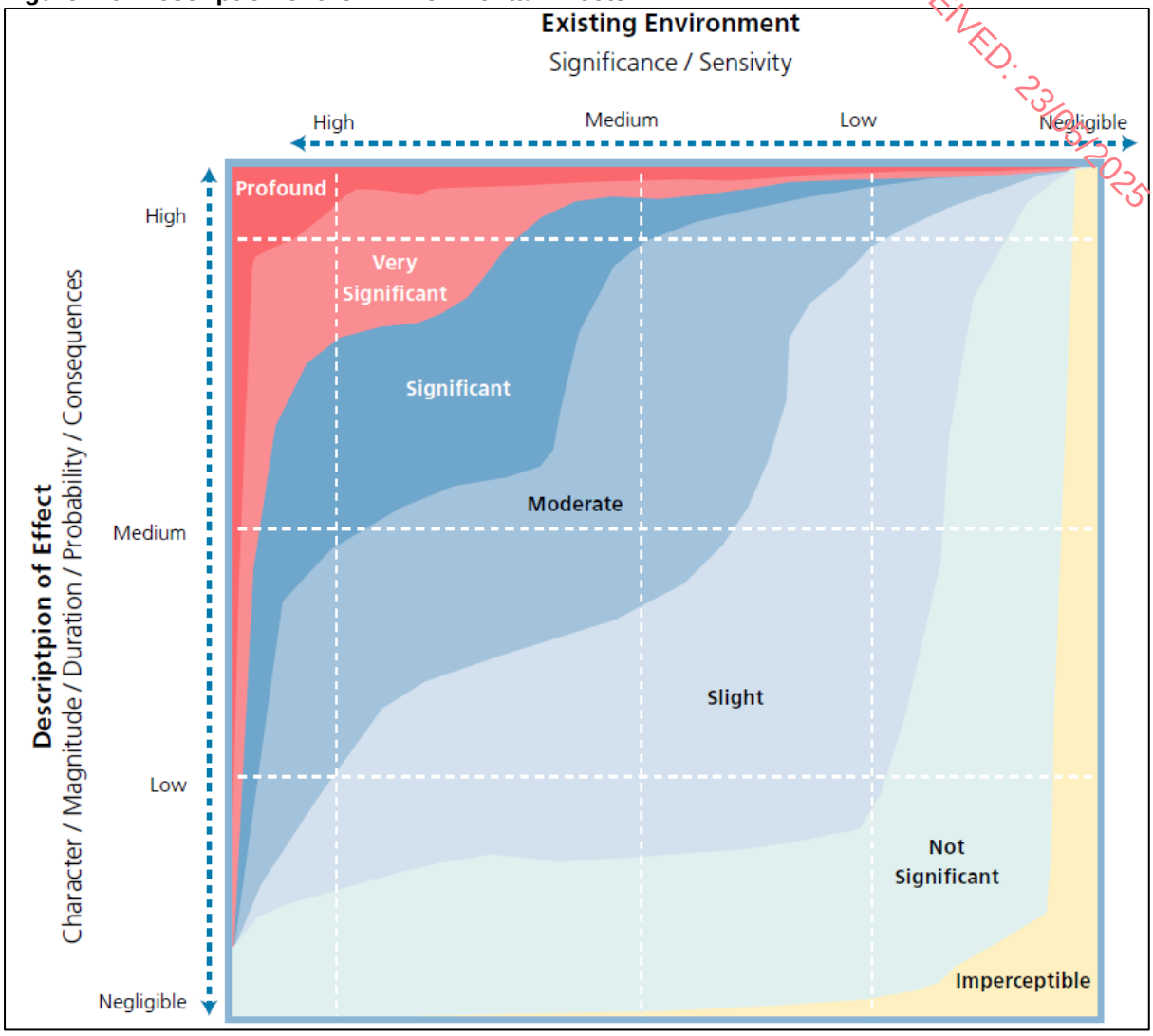


Table 1-2 defines the quality of effect of a Proposed Development on the environment ranging from positive to negative.

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 the improving 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 or by causing nuisance).

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

Table 1-3: Describing Significance of Effect

Classification	Criteria
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline 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 most of a sensitive aspect of the environment.
Profound Effects	An effect which obliterates sensitive characteristics.

Table 1-4 describes the terminology used to discuss the extent and context of effect of a Proposed Development 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 shows how likely an impact is to occur.

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.

Table 1-6 discusses the duration and frequency of effects. Momentary effects lasting from seconds to minutes will often be less concerning than a long-term and permanent effects, depending on their 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).

Magnitude	Description
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 Proposed Development.

Table 1-7: Describing Types of Effects

Magnitude	Description
Indirect Effects (a.k.a. Secondary or Off-site 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.
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 SOx and NOx 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 differ 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:

> *5.* "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 different effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the project. This description should take into account the environmental protections objectives established at Union or Member State level which are relevant to the project."

1.10 Non-Statutory Consultation

In accordance with best practice guidelines [11], [12], this EIAR included non-statutory consultation. 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 Response	Method of Response	Topics Raised	Relevant Chapter
An Taisce	N/A	N/A	N/A	N/A
WCC	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
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	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

Consultee	Date of Response	Method of Response	Topics Raised	Relevant Chapter
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
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
Inland Fisheries Ireland ('IFI')	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
Department of Housing, Local Government and Heritage	24/03/2025	Email (letter attached)	Consultation acknowledgement received. The consultee identified the site near several recorded archaeological monuments, including standing stones, cairns, and potential castle remains. The developer is required to commission a detailed archaeological impact assessment involving documentary research, geophysical surveys, and licensed archaeological testing, the results of which must form part of the	The topics raised by the Department are addressed in Chapters 6 and 13

Consultee	Date of Response	Method of Response	Topics Raised	Relevant Chapter
			EIAR. Depending on findings, recommendations may include preservation in situ, archaeological excavation (preservation by record), monitoring, and potentially establishing buffer zones around identified features. Compliance with national archaeological policy, which strongly prefers preservation in situ, and adherence to Wicklow County Development Plan archaeological objectives (particularly preserving recorded monuments and conducting thorough assessments) is mandatory. Regarding nature conservation, as the site is adjacent to the Slaney River Valley SAC, an Appropriate Assessment (AA) must evaluate potential impacts on this protected area, especially concerning aquatic habitats and species like otters. Ecological surveys, including otter and aquatic assessments within the zone of influence, are required, along with proposed mitigation, compensation, enhancement measures, and post-construction monitoring within the EIAR and AA.	
Uisce Éireann	20/03/2025	Email (letter attached)	Consultation acknowledgement received. The consultee has assessed the impacts of the proposed development on water and soils. The applicant must provide detailed plans and methodologies for proposed excavations, clearly assessing groundwater impacts, especially risks associated with excavation below groundwater levels and necessary dewatering measures. The EIAR should comprehensively address potential contamination risks from stormwater runoff and hydrocarbons throughout construction, operational, and decommissioning stages, proposing suitable mitigation to protect groundwater and surface waters. Detailed information on water supply and wastewater servicing must also be provided, alongside considerations for protecting Uisce Éireann drinking water sources, ensuring inert backfill material, managing trade effluent, preventing surface water discharges into combined sewers,	The topics raised by Uisce Éireann are addressed in Chapters 7 and 8, of the EIAR

Consultee	Date of Response	Method of Response	Topics Raised	Relevant Chapter
			and safeguarding public drinking water abstraction points. Additionally, infrastructure capacity and any required upgrades or diversions must be confirmed through Uisce Éireann, ensuring compliance with separation distances, avoidance of building over assets, and adherence to necessary connection agreements and regulatory standards.	
Health and Safety Authority ('HSA')	10/02/2025	Email (letter attached)	Consultation acknowledgement received. The consultee has indicated that the Proposed Development does not fall within their regulatory scope concerning major accidents hazards, resulting in no specific observations or concerns from their side.	No topics were raised by the consultee.
Health Service Executive ('HSE')	10/03/2025	Email (letter attached)	Consultation acknowledgement received. The consultee has raised the assessment of impacts arising from the Proposed Development in relation to population/human health, water (hydrology and hydrogeology), land, soils and geology, air quality, climate change and opportunity for health gain, noise and vibration and waste management, ancillary facilities and cumulative impacts as topics for attention. Additionally, the consultee has recommended that public consultation is undertaken, including the effectiveness of any existing mitigation currently in place for the existing quarry and identify where mitigations should be continued and/or reviewed, a Construction Environmental Management Plan (CEMP) should be included, decommissioning/restoration is considered and an environmental management system is put in place.	The topics raised by HSE are addressed in Chapters 3, 4, 5, 7, 8, 9, 10 and 11, of the EIAR.
Office Public Works ('OPW')	07/02/2025	Email (letter attached)	Consultation acknowledgement received. The consultee has raised the assessment of impacts arising from any potential construction, alteration, reconstruction of bridges, culverts or similar structures over watercourses associated with the development, which would require prior consent. Additionally, if the construction involves damming a watercourse	It is not envisaged that the Proposed Development will involve any of the activities described in the topics raised by OPW during the construction, operational or restoration stages.

Consultee	Date of Response	Method of Response	Topics Raised	Relevant Chapter
			with flume pipes or diversion channels, such activities may require consent. Therefore, the OPW's concerns pertain to the hydrological and hydraulic impacts of the Proposed Development, emphasizing the need for the appropriate consents and adherence to design standards to mitigate potential environmental effects	
Transport Infrastructure Ireland ('TII')	17/02/2025	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 and highlight that direct access or intensification of access to the N81, where a 100km/hr speed limit applies, is generally not permitted; The consultee has also specified the need to consider accumulative impacts and any conditions imposed by ABP on the road schemes in the area. A Traffic and Trasport Assessment (TTA) may be required, along with reference to TII's guidelines on sub-threshold TTA requirements. A Road Safety Audit should be considered, and any TMP must comply with TII standards. The CEMP should ensure compliance with TII requirements for works near the national road network. Additionally, a noise assessment is required, and suitable haul routes for material transport from the Site must be identified.	The topics raised by TII are addressed in Chapters 9,10,11 and 13.

A copy of the EIAR Consultation document is presented in Appendix 1-1. Copies of the submissions received from the Consultees are presented in Appendix 1-2. All consultation documents were issued on 07th February 2025.

1.11 Assessment of the Risk of Accidents and Unplanned Events

In accordance with the EPA guidance, the risks 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 Malone O'Regan Environmental ('MOR Environmental') project team included the following personnel:

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

Chapter(s)	Name	Role	Relevant Qualifications
All	Mark Day	Environmental Team Lead / Project Manager	BEng(Tech) Env. Studies with 13+ years' experience
Chapter 1-4	Mark Day	Environmental Team Lead / Project Manager	BEng(Tech) Env. Studies with 13+ years' experience
Chapter 5 Population and Human Health	Kenneth Goodwin	Associate Director & Project Director	BSc, Acoustics, Full Member IOA, IEMA Practitioner, 15+ years' experience
Chapter 6 Biodiversity	Dyfrig Hubble	Associate Director-Ecology, Biodiversity Chapter	BSc, MSc, CIEEM Full Member, 18+ years' experience.
Chapter 7 Land, Soils and Geology	Laura McGrath	Senior Environmental Consultant	BSc., M.Sc., PGeo with 10+ years' experience.
Chapter 8 Water	Laura McGrath	Senior Environmental Consultant	BSc., M.Sc., PGeo with 10+ years' experience.
Chapter 9/10 Air Quality/Climate Change	Klara Kovacic	Associate Director, Air Quality & Climate Chapter	MEng, MSc, DiB, Chartered Environmentalist with 15+ years' experience.
Chapter 11 Acoustics	Kenneth Goodwin	Associate Director & Project Director	BSc, Acoustics, Full Member IOA, IEMA Practitioner, 15+ years' experience
Chapter 12 Cultural Heritage	Refer to Table 1-10		
Chapter 13 Traffic	Refer to Table 1-10		
Chapter 14 Landscape and Visual	Refer to Table 1-10		

Chapter(s)	Name	Role	Relevant Qualifications
Chapter 15/16 Interactions of the Foregoing/Schedule of Commitments	Mark Day	Environmental Team Lead / Project Manager	BEng(Tech) Env. Studies with 13+ years' experience

In addition to the MOR project team, the team included the following external specialists:

Table 1-10: External Environmental Consultants

Primary Author	Company	Chapter/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	Chapter 14: Archaeology and 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 13: Traffic Impact Assessment	Chartered Engineer, BA, BAI, MSc, RSA Cert Comp, MIEI
Oliver McCafferty	Six-West Ltd	Planning drawings & fill calculations	UAV BNUC-S™ Pilot Director

2 PLANNING CONTEXT & THE NEED FOR THE PROPOSED DEVELOPMENT

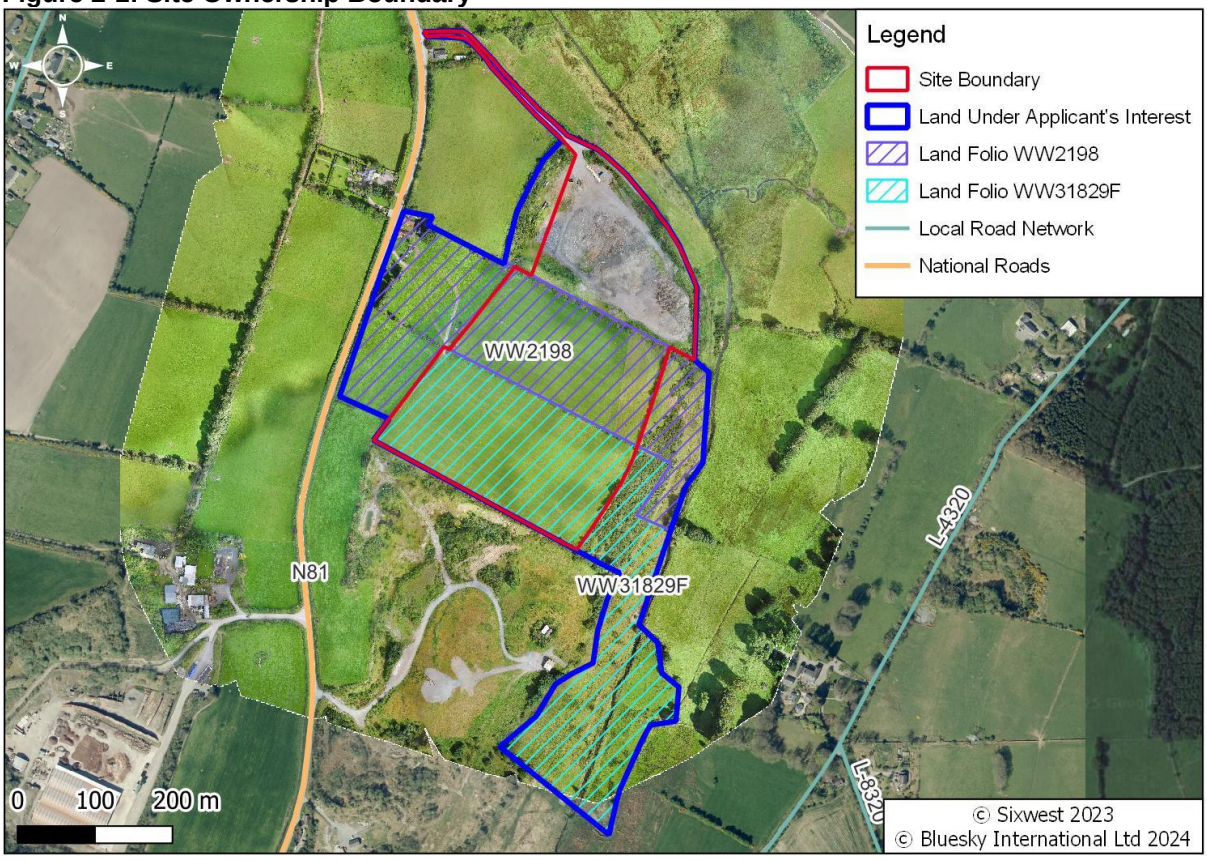
2.1 Introduction

This Chapter sets out the need for the Proposed Development through analysis of the most recent CDP [6], planning guidelines, policy frameworks and reports issued by the county, state and semi-state bodies.

2.2 Ownership Of the Lands

The lands corresponding to the Proposed Development, folios WW2198 and WW31829F, are owned by the Applicants with access through an existing authorised WFP lands owned by Mr. O'Neill. Access is via an existing industrial entrance onto the N81 national secondary road through the WFP. The lands associated with the former sand and gravel pit are owned by Joseph O'Neill, and a letter of consent has been acquired by the applicants for the use of the land. The Site is well served by existing infrastructure, benefiting from a priority-controlled T-junction with the N81. The posted speed limit is 80 kilometres per hour ('km/h'), and road signage is in place. A short 250m-long local access road connects the former sand and gravel pit entrance to the N81, which will facilitate access to the Proposed Development. Figure 2-1 below shows the Site in the context of the ownership boundary.

Figure 2-1: Site Ownership Boundary



2.3 Planning Application History

A study of the WCC e-planning website [1] identified the following large-scale proposed and existing developments that have been granted planning permission within the 2km study area of the Site, as outlined in Table 2-1 below.

Table 2-1: Planning History Within 2km of the Site

Planning Ref	Applicant	Application Date	Determination Date	Decision	Details
7466/82 PL27/5/58916	Joseph O'Neill	1982	30/12/1982	Refused Appealed to ABP and granted.	*"allowed for the extraction of sand and gravel in accordance with plans and particulars lodged. The permission is not time constrained. Two conditions attached. The map attached marks the permitted area within the boundary as c. 8.7 acres."*
991815	Breslin Brothers Ltd.	23/12/1999	15/05/2000	Granted	*"retention of sand & gravel pit, continued sand & gravel extraction incl. modify to site access, temp. screening banks & restoration of land to agri. use on cessation of works."*
16644	Leinster Pellets Ltd.	10/06/2016	04/08/2016	Granted	*"change of use of an existing vacant development from a concrete block manufacturing facility to the storage and natural drying of 2,000 tonnes of timber, sourced mainly from the local forestry and related sectors. The proposal also includes the erection of external walls and an internal partition at an existing 6543 sqm structure, to create an enclosed storage unit of 2178 sqm (with the remaining 4365 sqm in this feature, which is in a roofed open sided condition, not forming part of this application). This application also seeks permission for the upgrade of the existing on site wastewater treatment system, the installation of a weighbridge and permission for the retention of a 268 sqm plant room and a separate vacant building containing 253.5 sqm which will be used as an office in connection with this timber proposal, including a non habitable roof of 75 sqm which will be used as an office store along with all ancillary works and related uses, including car parking and equipment storage."*
17748	Austin Stephenson	22/06/2017	04/08/2017	Refused Appealed to ABP and granted.	*"restoration of a 2.3 ha disused sand and gravel quarry to agricultural grassland by backfilling using imported inert soil and stone,*

Planning Ref	Applicant	Application Date	Determination Date	Decision	Details
					applying a cover layer of soil and seeding with grasses and all temporary ancillary development including 1 no site office, 1 no portable toilet, 1 no wheelwash and improvements to site entrance, access gate, access road and internal access tracks. The activity will involve the importation of approximately 227,250 tonnes of inert soil and stones and will therefore also require a Waste Licence from the EPA. An EIS has been prepared."
201117	Joseph O'Neill	03/11/2020	17/08/2021	Granted	*"importation of inert soil and stones for use in site restoration of an extracted area of 2.73 hectares within the pit area authorised under PL27/5/58916, at a rate of 23,000 tonnes per annum and cumulative tonnage of 115,000 tonnes, restoration of part of existing pit using site won materials on 0.21 hectares, associated civil works and site infrastructure, including wheel bath and access road, for a period of five years."*
201291	Ray Kavanagh	17/12/2020	22/03/2022	Granted	*"importation of inert soil and stones for use, including through screening and soil recovery, in site restoration of an area of 1.26 hectares with a former gravel pit, at a rate of 10,000 tonnes per annum (100,000 tonnes total), along with permission to construct a wheel wash and weighbridge, use of a mechanical screener, internal access arrangements and the use of existing public road access, for a period of ten years."*
2560046	Herbie Stephenson	29/01/2025	25/03/2025 (Decision due date)	New Application	*"re-commencement and extension of a quarry, previously granted planning reference number 90/006374 and registered as QY/28 under S261. The Proposed Development is located within the townland of Deerpark and Donaghmore Co. Wicklow. The application includes the re-commencement of the old*

Planning Ref	Applicant	Application Date	Determination Date	Decision	Details
					quarry of circa 2 hectares and a phased extension to the extraction area of circa 5.01 hectares, to a finished quarry floor level of 165mOD requiring circa three benches each 15m in height. The Proposed Development will re-commence blasting, extraction and processing of rock using mobile crushing and dry screening and associated works, along with short term stockpiling of materials at the site. This application includes for the construction and provision of an upgraded site entrance, office/welfare facilities, carpark, wheel wash, weighbridge, haul routes and all other ancillary infrastructure, boundary berms, safety features and landscaping onsite. A total site area of circa 8.1 hectares is applied for. Upon completion of extraction activities, the Site will be subject to a Restoration Plan, which will be submitted as part of this application. A planning permission of 25 years is being sought for the Proposed Development. The application is accompanied by an Environmental Impact Assessment Report ('EIAR') and a Natura Impact Statement ('NIS') which will be available for inspection."

The review of the WCC planning portal indicated a number of planning applications that have been granted planning permission within the vicinity of the Site, refer to Table 2-2 below.

Table 2-2: Planning Applications within the Vicinity of the Site

Planning Ref	Applicant	Application Date	Determination Date	Decision	Details
977155	Michael Doran	03/11/1997	13/03/1998	Conditional	*"retention of conversion of garage to living space, storage shed, piered wall & entrance gates to front boundary & prov. of puraflo system."*
977156	Michael Doran	03/11/1997	13/03/1998	Conditional	*"single storey conservatory extension to rear of existing dwelling."*

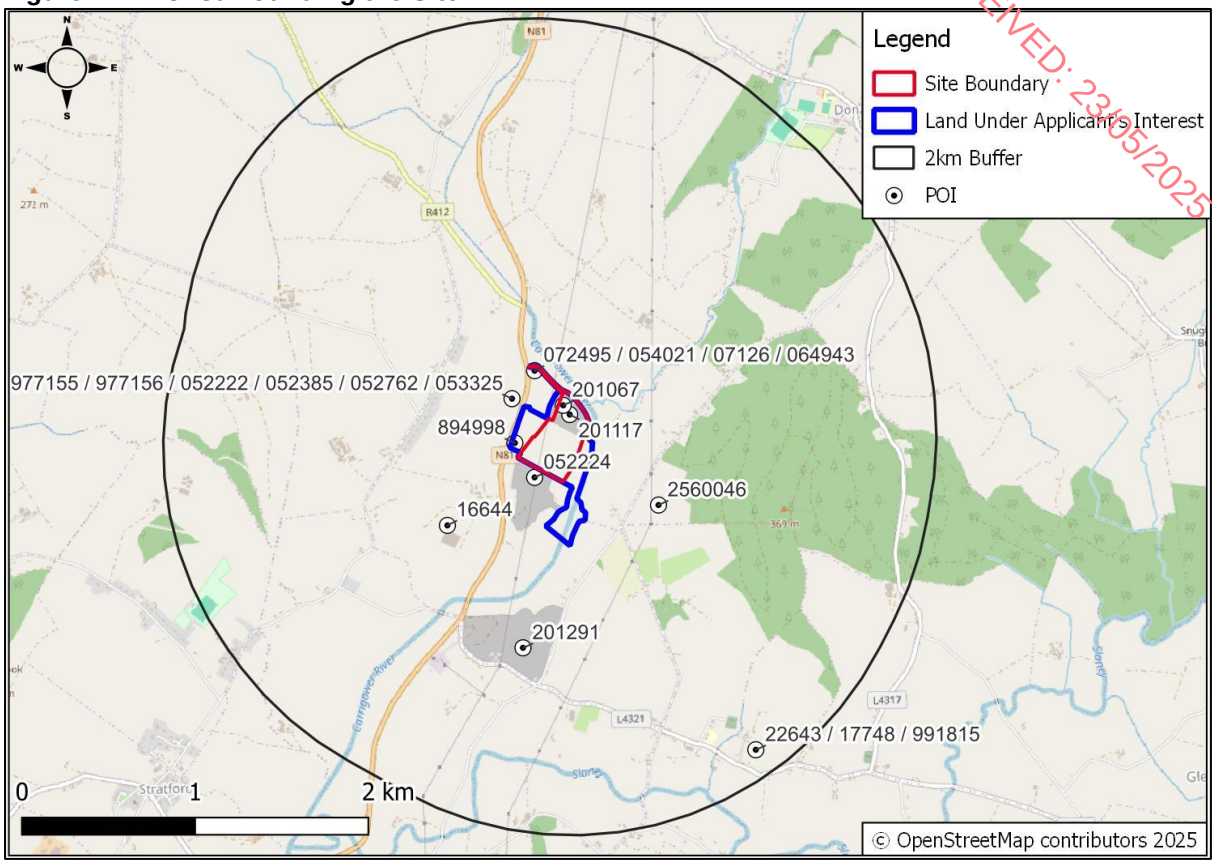
Planning Ref	Applicant	Application Date	Determination Date	Decision	Details
052222	Michael Doran	31/01/2005	24/03/2005	Conditional	*"Extension to existing shed and conversion to games room adjacent to existing dwelling and for existing garden shed to front of site."*
052385	Michael Doran	21/02/2005	16/05/2005	Conditional	*"Replacing single storey portion of existing dwelling with two storey extension to side, consisting of entrance hall, living, bedroom & sanitary accommodation, single storey link between existing dwelling & existing games room, new double doors & roof canopy to front facade of games room, new raised pitched roof with patent roof glazing over existing dining area to rear, rebuilding of existing front facade to two storey portion of existing dwelling including double height bay window, provision of additional floor area to ground floor sitting room, blocking up of 2 no. window openings to side elevation, provision of patent roof glazing to rear & side roof areas, replacing of existing upvc cladding & brickwork finishes with plaster render/selected stone finishes & provision of new waste water treatment system & percolation area, and associated site works."*
072495	Pat O'Neill	21/11/2007	24/01/2008	Conditional	*"155 sqm dormer style extension to rear of 75.5 dwelling house and the demolition of existing rear extension, new PG envirocare sewerage system and percolation area to EPA recommendations and all ancillary works."*
053325	Michael Doran	08/07/2005	01/09/2005	Conditional	*"Relocation of existing vehicular entrance."*

The former sand and gravel pit, located in the northern portion of the Site, was previously used for aggregate extraction and was granted planning permission on appeal (Planning Ref. 27/5158916) by ABP on 30th November 1982, after WCC initially refused it.

In 2021, WCC granted planning for the proposed WFP application (Planning Ref. 20/1117 with concerns regarding traffic been resolved through further information responses by the applicant. Request for information is attached in Appendix 2-1.

The points of interest ('POI') surrounding the Site are shown in Figure 2-2 below.

Figure 2-2: POI surrounding the Site



It is important to note that the Proposed Development is an extension to a former sand and gravel pit, which currently operates under a WFP. As such, this report considers the potential for in-combination effects with ongoing waste facility operations at the former sand and gravel pit to assess their combined impact and ensure that mitigation measures effectively address any potential cumulative effects. At the time of writing this report, the only notable development identified as potentially interacting with the Proposed Development was received by WCC on 29th January 2025 and submitted by Herbie Stephenson Limited, Planning Ref. 2560046. The application seeks permission for the re-commencement and extension of a previously approved rock quarry within the townland of Deerpark and Donaghmore, Co. Wicklow, covering an area of ca. 8.1ha.

Planning context for the Proposed Development has been considered in terms of national, regional and local planning policies in the sections below.

2.4 Policy Context

2.4.1 National Planning Context

Project Ireland 2040 was launched by the Government in February 2018 [13] 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, i.e., the National Planning Framework ('NPF') and the National Development Plan ('NDP') 2021 - 2030.

The NPF is a strategic high-level plan for shaping future growth and development, while the NDP outlines a strategy for investment of capital of over €116 billion to enable Project Ireland 2040.

2.4.1.1 Project Ireland 2040 - National Planning Framework

The First Revision of the NPF, was published on the 8th April 2025 [14],and approved by both Houses of the Oireachtas on 30th April 2025. The NPF is the national policy for the strategic planning and sustainable development of Ireland up to 2040. 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 plan states the importance of the aggregates industry in delivering Ireland's national infrastructure [13]:

> *"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".*

Within NPF2040 there are ten National Strategic Outcomes ('NSOs'), of which NSO9 (Sustainable Management of Water, Waste and other environmental resources) states that:

> *"Abundant natural and environmental resources such as our water sources are critical to our environmental and economic well-being into the future. Conserving and enhancing the quality of these resources will become more important in a crowded and competitive world as well as our capacity to create beneficial uses from products previously considered as waste, creating circular economic benefits."*

National Policy Objective ('NPO') 30 is to:

> *"Facilitate the development of the rural economy, in a manner consistent with the national climate objective, through supporting a sustainable and economically efficient agricultural and food sector, together with forestry, fishing and aquaculture, energy and extractive industries, the bio-economy and diversification into alternative on-farm and offfarm activities, while at the same time noting the importance of maintaining and protecting biodiversity and the natural landscape and built heritage which are vital to rural tourism."*

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. The NPF also highlights the need for additional housing within Ireland.

NPO 42 is to:

> *"To target the delivery of housing to accommodate approximately 50,000 additional homes per annum to 2040."*

2.4.1.2 Project Ireland 2040 – National Development Plan

The NDP 2021-2030 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.

2.4.2 Essential Aggregates Providing for Ireland's Needs to 2040

Following the launch of Project Ireland 2040, the Irish Concrete Federation released the report "Essential Aggregates: Providing for Ireland's Needs to 2040" [15]. 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 2018 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 building upon a former sand and gravel site, which has proven the viable reserves within this hill, 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. It is increasingly difficult to source quality aggregates required for construction products such as high specification concrete, adjacent to major population centres, in particular Dublin. In the absence of a local source of aggregates, demand can only be met by transporting large volumes of heavy product over longer distances with the obvious negative economic and environmental consequences"*

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, directly addressing the availability of quality aggregates in proximity to large population centres.

2.4.3 Regional Planning Policy Context

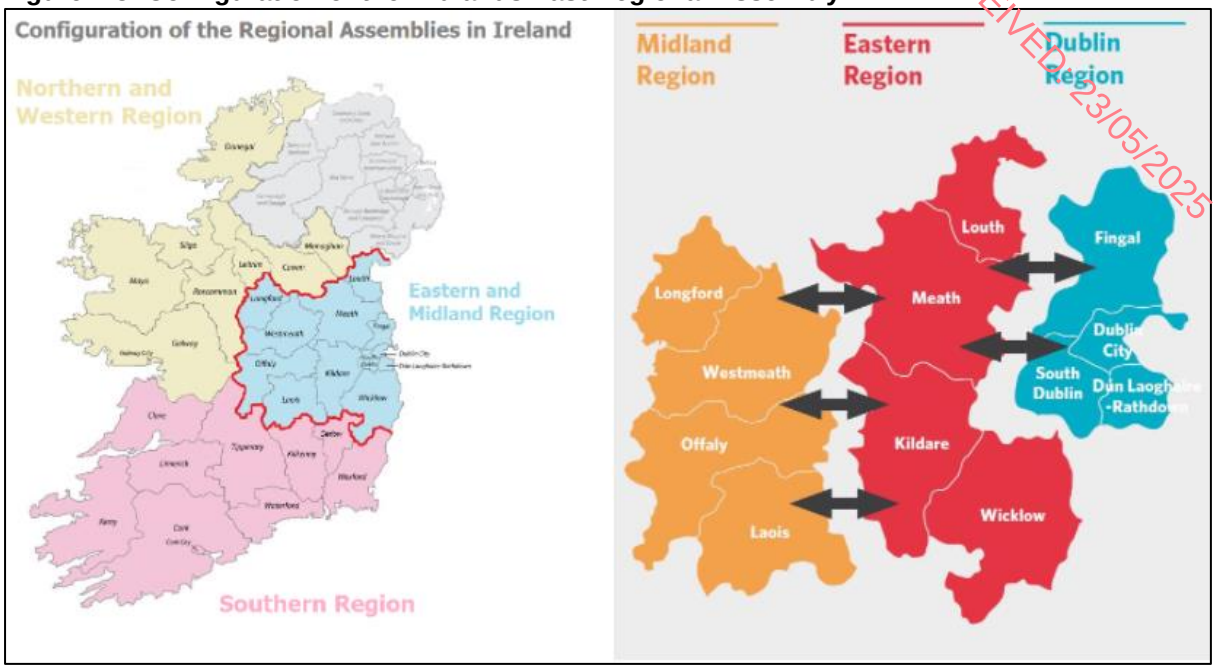
2.4.3.1 The Eastern and Midland Regional Assembly

County Wicklow is part of 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 was formed under the Local Government Reform Act 2014 [16]. The Eastern and Midland Region comprises the following counties:

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

See Figure 2-3 below for context.

Figure 2-3: Configuration of the Midlands East Regional Assembly



The Eastern and Midland Regional Assembly ('EMRA') 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 [17] .

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 Regional Policy Objective ('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.'*

2.4.4 Local Policy

2.4.4.1 Wicklow County Development Plan 2022-2028

WCC adopted the most recent CDP on 12th September 2022 [6]. The CDP outlines the objective 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 Section 9.6 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.

2.5 The Need for the Proposed Development

The Proposed Development will facilitate the extraction of high-quality aggregates for supply to the construction industry and concrete manufacturing sector. This contributes to regional economic growth and aligns with the objectives of the CDP.

The Site hosts sand and gravel deposits of significant commercial value, formed during the deglaciation period, and well-suited for construction applications such as concrete production and road base. Development of the Site will enhance local supply, reduce reliance on distant sources, lower transport emissions, and support national policy goals for sustainable mineral resource management, which are further discussed in Section 7.3.7.

As outlined in Section 2.4, the policies and objectives of local and regional plans for the Eastern and Midlands area prioritise economic and infrastructure development. Meeting these objectives will require a reliable supply of high-quality aggregates from a network of efficient and competitive quarry operators.

3 DESCRIPTION OF THE PROPOSED DEVELOPMENT

3.1 Introduction

This chapter provides an overview of the existing environmental conditions and the current operations within the Site, as well as a description of the Proposed Development.

3.2 Overview of the Proposed Development

The Proposed Development will encompass a total area of ca. 11.2ha, of which ca. 7.75ha is designated for extraction activities. The extraction area will be situated within land parcels identified by Folios WW2198 and WW31829F, which are currently in agricultural use and separated by a hedgerow. These lands are under the ownership of the Applicants (Refer to Figure 2-1).

The southern boundary of the former sand and gravel pit—adjacent to Folio WW2198—is defined by a prominent gravel embankment that slopes backwards in a southerly direction. This feature rises ca. 20m above the current pit floor and presents a steep, largely vegetated surface, covered with grass and sparse low-lying shrubbery. It remains visually prominent from the northern approach (refer to Plate 3-2).

The Proposed Development will establish a new sand and gravel extraction area to the south of the former sand and gravel pit, aiming to provide a reliable supply of high-quality aggregates to the local market. It is estimated to yield an in-situ reserve of approximately 1,140,762m^3 of aggregate material, equivalent to approximately 2,053,372t (based on a conversion factor of 1.8), within the proposed 7.75ha extraction area.

Site access is provided via a 250m-long internal roadway connecting directly to the N81, a key arterial route that links the M50, M9 and M11 national road networks. This ensures efficient transportation of materials by HGV's (Refer to Plate 3-1 below).

The Proposed Development will utilise the existing infrastructure, weighbridge, wheel wash, site office, access routes and on-site well, which is currently operated within the WFP.

Within the locality of the Site, there are ca. six residential and business properties within 350m, with additional linear one-off residential dwellings in Whitestown Lower, located ca. 1km west of the Site.

Plate 3-1: Site Entrance

The Proposed Development aims to establish an extraction pit with associated stockpiling and dry and wet screening. After developing a new pit floor, a washing plant, shed, concrete plinth, oil / water separator, and water management system will be installed.

The project will involve stripping topsoil to access the underlying aggregate. Access into the extraction area will be from the existing WFP pit floor through the ridge between the agricultural fields and the WFP to create an entrance into the extraction area.

The extraction area internal boundary slope will be at a gradient of 1:1.5 to a depth of 143mAOD, featuring a bench at 153mAOD to provide stability. No extraction is planned to occur below the groundwater table. The estimated groundwater level is approximately 129 mAOD, which will provide a cover of ca. 14m between the base of extraction and the groundwater level.

Based on preliminary assessments of local sensitivities, the existing hedgerow boundaries to the east, south and west will be enhanced with a native seed mix, while the northern boundary of the extraction area will be modified for access. Refer to Figure 3-6 below.

The Proposed Development's operations will involve the extraction and screening of aggregate materials, with ca. 275,000t to be excavated, processed, and transported to market annually.

3.3 Description of the Proposed Development

The Proposed Development includes the following:

- The extension of the former sand and gravel pit to the south;
- Stripping of topsoil and stockpiling for future use;
- Short-term storage of graded aggregate in stockpiles;

- The installation of a shed, concrete plinth, oil / water separator, wash plant, mobile crusher and screening and associated settlement ponds;
- The use of front loader(s) and mobile screening plant;
- The creation and planting up of hedgerow boundaries;
- The extraction of sand and gravel to produce aggregates within the Proposed Development's Site boundary;
- The restoration of the Site.

3.3.1 Extension & Extraction

The Proposed Development will extend the former sand and gravel pit by a total of ca. 7.75ha into the greenfield lands to the south. Refer to Plate 3-2 and Plate 3-3 below for context. The Site has an estimated reserve of ca. 1,140,762m^3 of sand and gravel or ca. 2,053,372t, using an estimate of 1.8t/m^3 of aggregate. The Proposed Development plans to extract and process up to a maximum output of 275,000t per annum.

The Proposed Development will seek to extract sand and gravel from the existing levels down to 143mAOD, featuring benches at ground level, ca. 162mAOD and 153mAOD. Cross sections of the Proposed Development's finished extraction levels are included in Figure 3-1 below, as extracted from Drawing No. MW230824 Phase 4 Sections.

Figure 3-1: Cross Sections

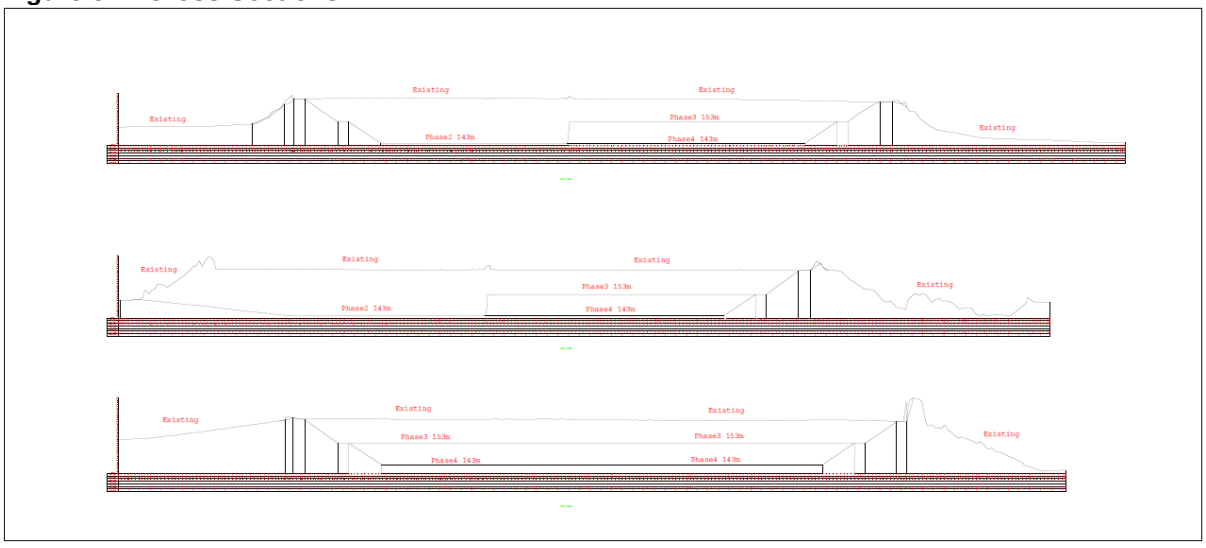


Plate 3-2: Former Sand and Gravel Pit

Plate 3-3: Extension Lands

3.3.2 Removal of Soils

The Proposed Development will involve the stripping of the existing topsoil to access the underlying sand and gravel in the extension lands.

There will be two distinct instances of soil removal: once during Phase One development and once during Phase Three development. To develop the Site in an organised manner, topsoil clearance will be minimised. Typical topsoil removal operations would be ca. ≤1.0ha per day.

Soils removed during Phase One will be used within the WFP to restore the land along the separating slope, starting from the east and moving towards the west.

Soil and topsoil removal will require the use of a bulldozer or loading shovel type unit and a dump truck for its transport.

3.3.3 Aggregate Processing & Storage

An excavator and dump truck and/or loading shovel will remove the sand and gravel aggregates and transport it to the proposed mobile crusher and screening plant. During the opening and development years of the Site, a mobile crusher and dry screening plant will be positioned within the WFP pit floor. Upon clearing a suitable pit floor within the extraction area, the mobile screener will be moved into Phase One.

The Proposed Development will also include the operation of a wet screening plant, a water management and recycling system. These will be established during Phase Two works, where the pit floor is down to ca. 143mAOD. A water management system will be developed, and

the mobile washing plant erected. This will enable water used by the washing plant to be recirculated, minimising the volume of fresh water to be added. An existing well located near the existing office, will be commissioned and piped to the water management ponds for top-up purposes. Additionally, the pit floor will be directed towards the ponds to collect any stormwater that arises for capture and use in the washing plant.

The aggregate extraction and processing will require the use of two loading shovels, an excavator, a diesel generator, mobile dry screener, mobile crusher, mobile washing plant and existing on-site infrastructure.

3.3.4 Structures & Plant

The washing plant will be installed after the completion of Phase One and during Phase Two, once the pit floor in the northeast section of Folio WW2198 has reached the proposed depth of 143mAOD.

The Proposed Development will utilise key existing ancillary infrastructure within the historic sand and gravel pit, including the site office, weighbridge, wheel wash and on-site well. Refer to Figure 3-2 for context.

A mobile dry screener and crusher will follow the working face during the life of the operation.

A shed will be positioned on the northern boundary of the extension lands during Phase Two. This shed will hold any lubricants or other items needed and will include an external concrete plinth for refuelling of loading shovels and other fully mobile plant. The plinth will be equipped with drainage via an oil interceptor to the open water management ponds. No fuel storage tanks will be present onsite, and the concrete refuelling plinth will be attended by a mobile bowser if needed.

Semi mobile plant, including the dry screener, wet screener and crusher, will be refuelled by the bowser using drip trays.

3.3.5 Landscaping

The Proposed Development will include:

- Creation of boundary hedgerows;
- Planting up existing hedgerows with a native seed mix;
- Removing a portion of the intervening hedgerows and ridge between the WFP and the extension area; and,
- Removing the hedgerow between folio WW2198 and WW31829F (refer to Chapter 6 - Biodiversity).

During the life of the Proposed Development, hedgerows will be removed. A small portion of this will occur in year one, in creating the entrance from the WFP into the extension lands. The remainder will occur during Phase Three development and the loss of the hedgerows separating the two greenfields within the extension lands.

Landscaping measures will be instigated during years one to three, and the hedgerows bordering the south, east and west of the Site will be enhanced with native tree and shrub species for screening purposes. This will also benefit wildlife within the area.

3.3.6 Restoration

Upon removal of the aggregate reserve, the Site will undergo rehabilitation as per the Restoration Plan attached as Appendix 6-1.

The topsoil removed during Phase One will be used to complete the 0.21ha restoration area located in the southeast section of the WFP site, which is designated for reinstatement using

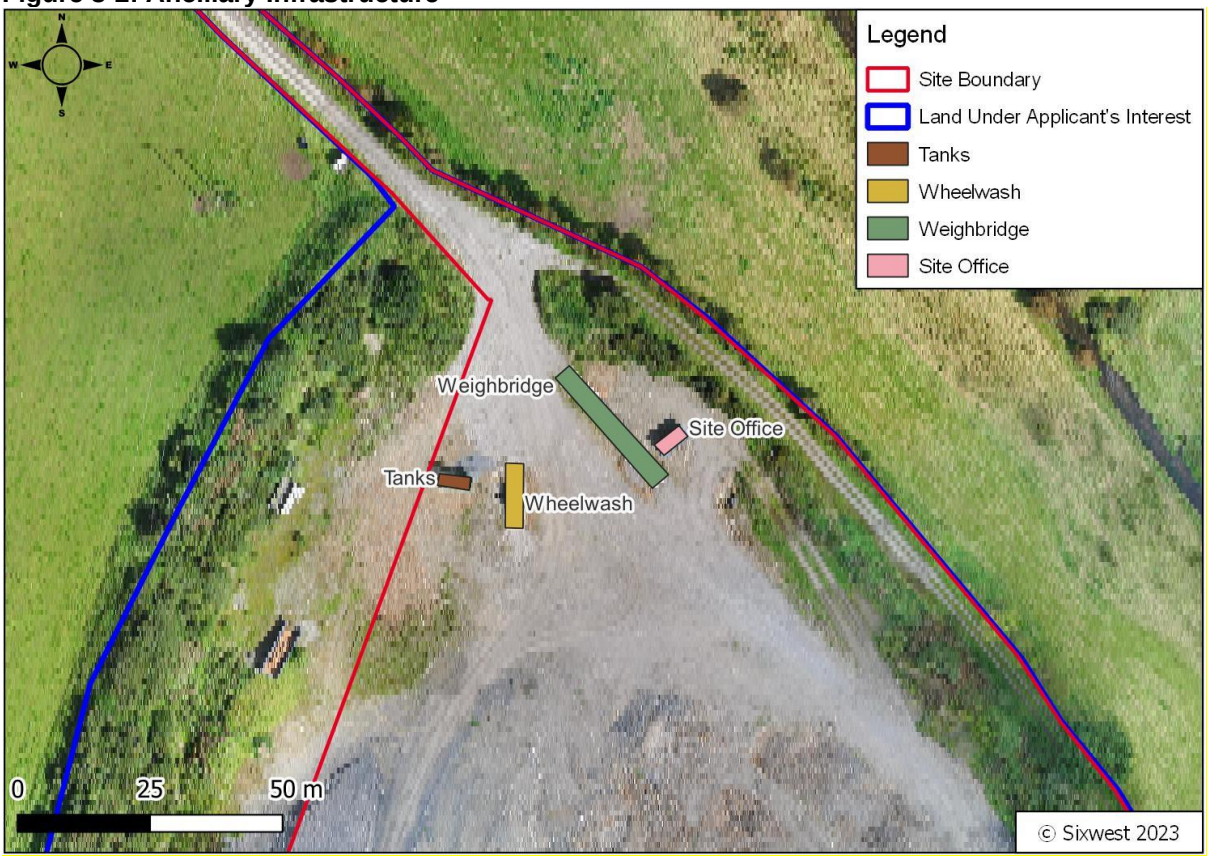
site-won materials. Any remaining topsoil will be used to soften the southern slope where the WFP lands meet the adjoining greenfield extraction area.

Additional soils removed during Phase One will be stored on-site for future use in the restoration of the greenfield lands.

Restoration of the greenfield area will involve the importation of topsoil to facilitate agricultural land use. Pit faces and benches will be maintained and planted with a native seed mix to improve the soil retention. Any remaining topsoil stripped from the Proposed Development will then be utilised to cover the imported soils before seeding. The hedgerow dividing folios WW2198 and WW31829F will be replanted. All imported materials for use in restoration will comply with the National By-Product Criteria in accordance with Regulation 27 of the European Communities (Waste Directive) Regulations [7]. Only materials that meet these criteria and are deemed suitable for reuse without posing a risk to the environment or human health will be accepted on-site (refer to section 3.4.4).

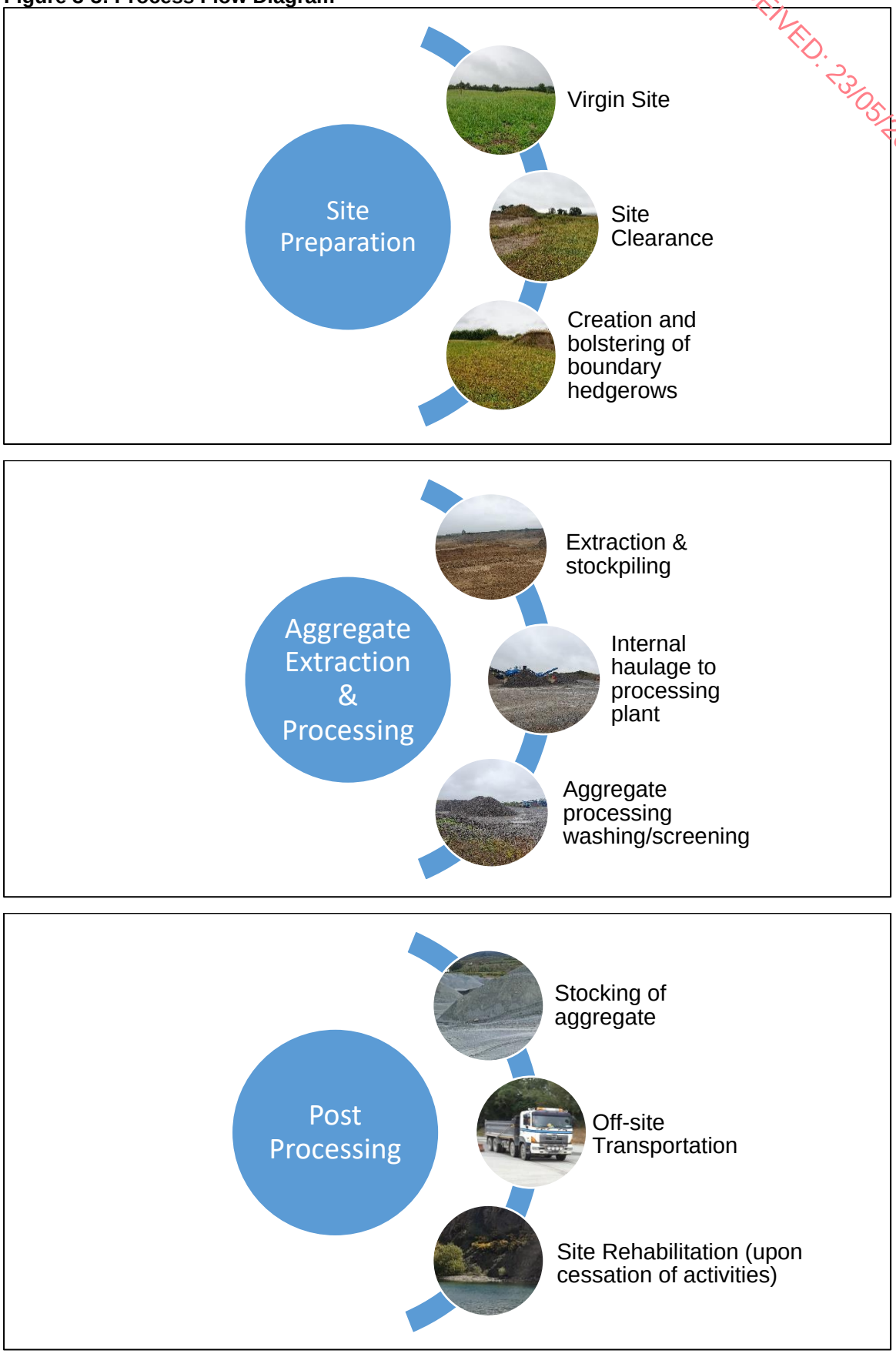
Restoration will be phased, with soils removed during Phase Three Site preparation used in the restoration of lands in areas of Phase One and Two which will be no longer in use.

Figure 3-2: Ancillary Infrastructure



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

Figure 3-3: Process Flow Diagram



Each stage has distinct activities associated with the works undertaken and are discussed in detail below.

It should be noted that as the Proposed Development is an extension of the former sand and gravel pit, the potential impacts arising from the former sand and gravel pit in combination with the Proposed Development have been assessed as part of this EIAR.

3.3.7 Scale of the Proposed Development

The Site covers an area of ca. 11.2ha, of which ca. 7.75ha is proposed for aggregate extraction. It is proposed to extract up to a maximum output of 275,000t of aggregates per annum on average.

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

- Construction and Operational Stage (15-18 years); and,
- Restoration Stage (2 years).

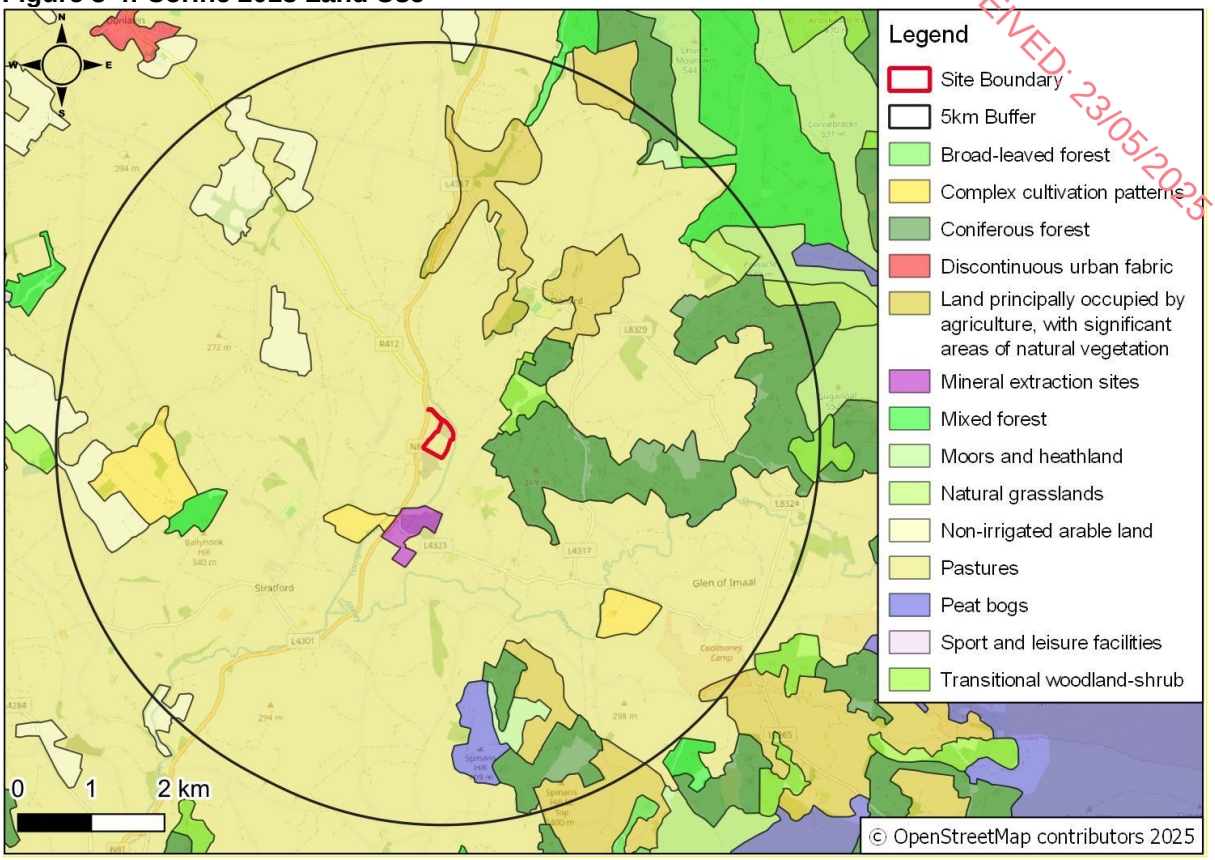
If the Proposed Development meets the proposed extraction rate (ca. 275,000t per annum), the extension lands could be exhausted through an operational stage of ca. 7.5 years. However, due to unknown future economic and market needs, it is likely the Proposed Development will extract lower rates than the extraction rate stated above and will, therefore, need a longer operational period. Planning permission is being sought for 20 years. The construction and operational stages will be considered together rather than separately and are expected to take 15-18 years, followed by an additional two years for the restoration stage to rehabilitate the extended area after excavations are completed.

3.3.8 Land Take

The Proposed Development incorporates an area of ca. 7.75ha, which will extend the former sand and gravel pit in a southerly direction.

The extension land at the Proposed Development is owned by the Applicants 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 east and northeast. The quarry south of the Site is classified as a mineral extraction site. Refer to Figure 3-4 below for further details.

Figure 3-4: Corine 2018 Land Use



3.4 Development Phasing

This EIAR has identified two stages that will need to be assessed, the Construction – Operational Stage and the Site Rehabilitation Stage - Site closure. Each of these stages have distinct activities associated with the works undertaken.

3.4.1 Construction and Operational Stages

The Construction Stage involves preparing the greenfield agricultural lands within the Proposed Development, extending south from the former sand and gravel pit for aggregate processing activities. Initial works include removing intervening hedgerows between the former sand and gravel pit and the extension area of the Proposed Development (see Chapter 6 – Biodiversity), breaking through the boundary ridge between the former sand and gravel pit and extension lands to establish an entrance into the sand and gravel resource.

3.4.2 Structured Phasing Plan

The construction and operational stages will be structured in different phases, with each phase involving both preparatory construction activities and subsequent aggregate extraction.

The Proposed Development will be divided into two sections—northern (Folio WW2198) and southern (Folio 31829F)—separated by an existing hedgerow running west to east. The extraction works will be phased accordingly over the operational lifetime of the sand and gravel pit. The estimated volumes of topsoil to be removed during each phase are outlined below:

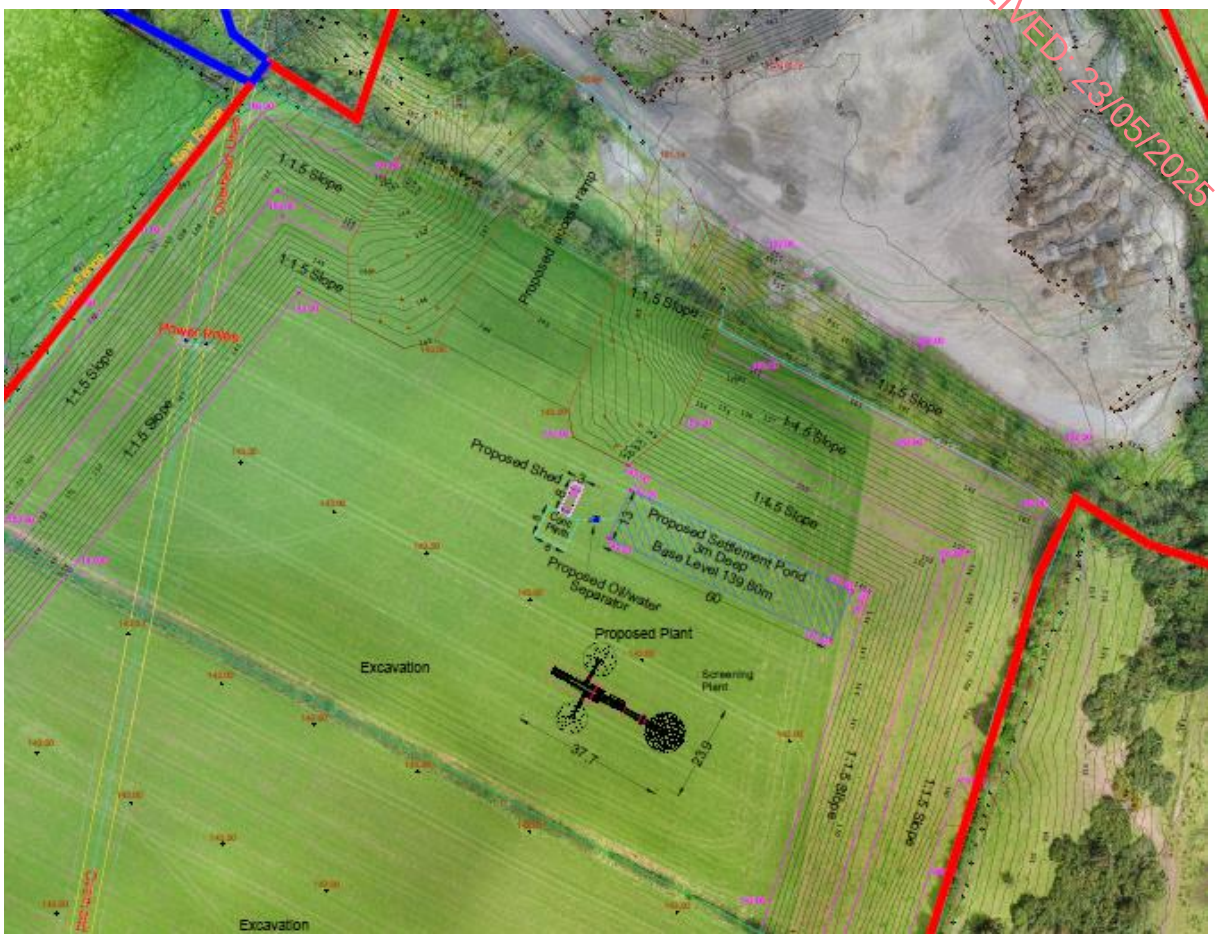
- Phase One: Excavation will commence in the northern section, with material excavated at a slope gradient of 1:1.5 down to an elevation of 153.0mAOD. Approximately 9,600m³ of topsoil will be removed from an area of approximately 32,000m² (refer to Drawing No. MW230824 Phase 1 Overview);

- Phase Two: A bench will be created at 153.0mAOD, followed by further excavation of the northern section down to the final pit floor level of 143.0mAOD, again at a 1:1.5 slope. Upon achieving the proposed base level, a 13.0m by 60.0m settlement pond will be constructed in the northeast corner, with a final depth of 139.8mAOD. The surrounding pit floor, in the vicinity of the settlement pond, will be graded to ca. 142.8mAOD to promote natural drainage into the pond. Additionally, a 3.0m by 8.0m generator shed will be installed west of the pond, along with an 8.0m by 8.0m concrete plinth adjacent to the shed entrance. A drainage line will direct runoff from the plinth through an oil / water separator before discharge into the settlement pond. Phase Two will begin in the eastern section to allow for the installation of the infrastructure during this phase (refer to Drawing No. MW230824 Phase 2 Overview);
- Phase Three: Excavation works will commence in the southern section, where overburden will be removed from ground level at a 1:1.5 slope down to 153.0mAOD. It is expected that ca. 13,667m³ of topsoil is expected to be removed from an area of ca. 45,555m² (refer to Drawing No. MW230824 Phase 3 Overview);
- Phase Four: A bench will be constructed at 153.0mAOD in the southern section, with further excavation to the final pit floor level of 143.0mAOD, continuing at a 1:1.5 slope (refer to Drawing No. MW230824 Phase 4 Overview);
- The topsoil layer will be carefully stripped and stored separately in sited stockpiles to minimise effects to its structure, fertility, and suitability for future restoration and landscaping. It is proposed that the topsoil removed from the Proposed Development will be used in the restoration of the 0.21ha of the planning permission (Planning Ref. 201117) area;
- Soil stripping and stockpiling operations will be avoided during periods of excessively dry or wet weather to minimise the risk of structural degradation and compaction;
- Stockpiles will be clearly marked and segregated to differentiate between soil types and to ensure proper material handling during reinstatement stages;
- Stockpiles will be managed to prevent unnecessary compaction, particularly within the core, to avoid anaerobic conditions that may reduce the biological functionality of the soil;
- Movement of construction traffic will be restricted to predefined haul routes to minimise disturbance and compaction of surrounding soils; and,
- No soils will be transported off-site. All excavated topsoil will be retained for on-site restoration and landscaping purposes.

The plant for topsoil and aggregate removal will include the use of an excavator, two loading shovels and a bulldozer-type unit. The sands and gravel aggregates will then be moved to the proposed screening plant within the pit floor in the Proposed Development area for further processing. The Proposed Development will seek to utilise existing haul routes to access the extension lands.

The Proposed Development will also include the operation of dry and wet screening, a water management and recycling system, and a shed to house a diesel generator, as shown in Figure 3-5 below. Additionally, it will utilise existing infrastructure within the WFP, including the site office, wheel wash, on-site well and weighbridge. Refer to Figure 3-3 above for context.

Figure 3-5: Proposed infrastructure – Extract from Drawing No. MW230824 Site Plant



Both the continued use of existing infrastructure and the development of new Site infrastructure are assessed within the Construction and Operational Stages of this EIAR.

The screened aggregate will be stockpiled using a loading shovel. Off-site transport will be via HGVs.

3.4.3 Export of Material

Aggregate will be exported from the Site by HGVs. It is estimated that a maximum single year total output of 275,000t of aggregate material can be excavated and removed from the area corresponding to the Proposed Development. Additionally, wet and dry screening will occur on-site.

This extraction rate has, therefore, been used to determine the daily traffic volumes associated with the Proposed Development. Table 3-1 below 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	
Total Exported Material (maximum potential tonnes per annum)	275,000
Quantity per week (49 operational weeks/year)	5,612
Quantity per day (5.5 workings days/week)	1,020

Exported Quantities of Material and Average Daily Trips	
Loads per day (25 tonnes per load)	41

3.4.4 Restoration Stage – Site Closure

Following the completion of extraction activities, the Site will undergo a comprehensive reinstatement and restoration process designed to develop the land to a productive and environmentally sustainable condition. The strategy has been developed in accordance with best practice guidance and is intended to restore soil functionality and ensure long-term integration of the Site with the surrounding landscape.

The restoration stage will be carried out in line with a dedicated Restoration Plan, which has been prepared by MOR Environmental and accompanies this planning application (refer to Appendix 6-1). The Restoration Plan outlines proposed restoration measures for each stage of the development, in addition to actions to be undertaken once operations have ceased.

Restoration will involve the careful placement of remaining stored topsoil and subsequent seeding to recreate habitats similar to those that existed prior to extraction activities. As described in Section 3.4.2, topsoil from the Proposed Development will be used in the restoration of the 0.21ha outlined in the planning permission (Planning Ref. 201117).

To complete the restoration of the Proposed Development, topsoil will need to be imported. It is proposed that a 0.5m thick topsoil layer will be added to the area disturbed by the excavation of aggregates; this will require up to 65,875t of soil to be brought into the Site. It is envisaged, based on the current guidance outlined by the EPA, that this soil will be sourced through non-waste pathways, i.e. Declared Regulation 27 soils or greenfield soils (Refer to Section 3.4.4).

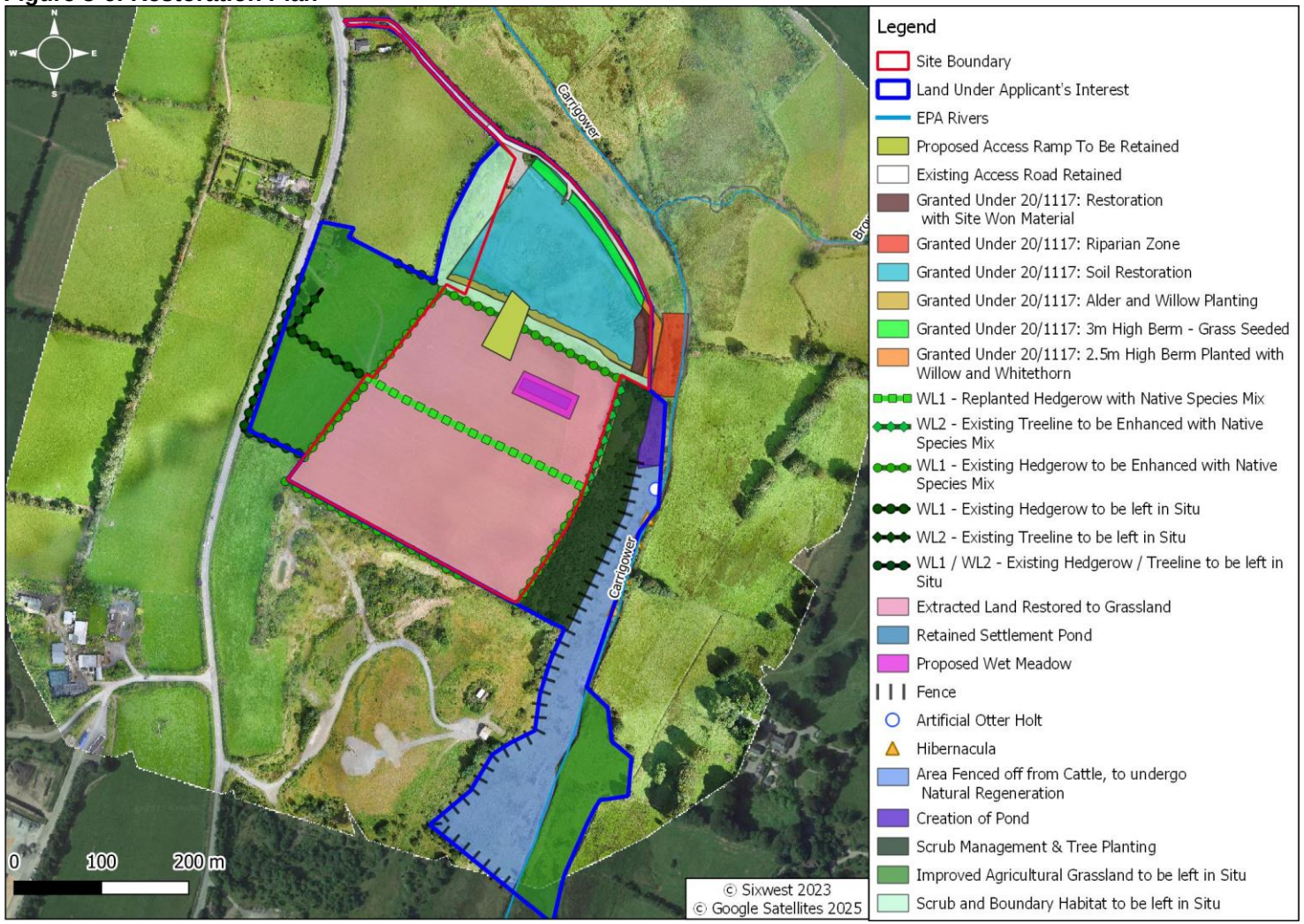
The removed hedgerow between Folio's WW2198 and WW31829F will be re-established, and the proposed water management pond will be fully retained and enhanced to form a permanent biodiverse waterbody that will support local fauna and flora. The access into the excavated lands through the ridge along the boundary of the WFP will be left in place and covered with a topsoil layer and then seeded (see Figure 3-6 for context).

All mobile and semi-mobile plant and equipment will be removed from the Site.

The shed will be dismantled and removed upon the completion of the works. However, it is proposed to leave in-situ the concrete plinth and shed floor.

The underground oil interceptor will be depolluted by a competent and National Waste Collection Permit Office ('NWCPO') authorised operator to ensure no oils or silts remain. The tank will be left in situ.

Figure 3-6: Restoration Plan



The final landform will be carefully regraded, with pit faces and benches maintained and planted with a native seed mix to improve the soil retention and biodiversity purposes. These measures will help to minimise erosion risks and create a more natural landscape setting post-extraction.

A central element of the restoration plan involves the development of a wetland habitat within the area occupied by the settlement pond. This wetland will be designed to support biodiversity by incorporating gently sloping margins and transitional zones, encouraging the establishment of native wetland vegetation and providing habitat for invertebrates, amphibians, and bird species.

The remaining areas of the Site will be reinstated to agricultural grassland. In addition to the reuse of stored on-site topsoil, the restoration process will involve the importation of by-product soils from other developments to achieve the required landform and functional profile. An estimated volume of approximately 38,750m³ of soil (equivalent to 65,875t, based on a conversion factor of 1.7m³/t) will be required to restore the site, assuming a topsoil thickness of 0.5m across the full restoration area. Once the imported material is placed and shaped, stored topsoil will be applied to the surface prior to seeding.

A multi-species grass sward will be established within the reinstated agricultural grassland. These swards comprise a mixture of grasses, legumes, and herbaceous species, providing a valuable source of minerals, protein and energy for livestock. The inclusion of nitrogen-fixing legumes will help reduce the need for artificial fertiliser application, contributing to improved soil health and sustainability. Furthermore, the increased botanical diversity will support local invertebrate populations and enhance foraging opportunities for wildlife.

Drainage features will be incorporated into the final landform to facilitate sustainable surface water management and to maintain the hydrological function of the wetland. Shallow flow paths or swales will be included to guide surface water across vegetated areas and prevent localised erosion.

Overall, the reinstatement and restoration strategy will ensure the Site is returned to a stable, ecologically rich, and visually appropriate condition. The proposed measures will provide long-term environmental benefits, restore soil productivity, and contribute positively to local biodiversity and landscape character.

Chapter 4 of this EIAR will consider additional design options for restoring the area corresponding to the Proposed Development.

3.4.5 By-Product Soil and Stone Acceptance Criteria

When importing greenfield and uncontaminated soil and stone to a site, it is essential to adhere to specific acceptance criteria to ensure that the materials are classified as by-products rather than waste. The National By-Product Criteria (Regulation 27) (Ref No. BO-N002/2024) [7] outlines the requirements that must be met for these materials to be accepted on-site. The criteria are designed to ensure environmental protection, public health safety, and compliance with regulatory standards. Below are the key acceptance criteria for both greenfield and uncontaminated soil and stone:

1. Source Verification

Materials must originate from a verified greenfield site or a site where the soil and stone are deemed uncontaminated. This includes an assessment of the source to confirm that it meets environmental standards.

Documentation demonstrating the source of the soil and stone, including any relevant site assessments, laboratory test results, and compliance certificates.

2. Physical and Chemical Composition (From non-greenfield sites)

Characterisation of the soil and stone to determine its physical and chemical properties. This includes tests for pH, particle size distribution, moisture content and organic matter content if the material is not from a greenfield site.

Ensure that contaminant levels (e.g., heavy metals, hydrocarbons, and other harmful substances) are below specified thresholds as outlined in the by-product criteria. This typically involves laboratory analysis of soil samples.

The materials should fall within acceptable soil classification categories, such as sandy, clayey, or gravelly soils, without any hazardous or toxic components.

Confirm that the materials do not pose risks to human health or the environment. This may include bioassays or leachate tests.

Perform a risk assessment to evaluate potential exposure pathways and determine the suitability of the material for the intended use on-site.

All materials imported to the Site should be free of invasive species, with suitable evidence provided.

3. Site History

Assess the historical land use of the source site to ensure that it has not been subject to activities that could result in contamination (e.g., industrial operations, landfills, or chemical spills).

Review environmental records for the source site to identify any past contamination incidents or regulatory violations.

4. Regulatory Compliance

Ensure that all necessary notifications and approvals from regulatory bodies (e.g., the EPA) are obtained before importing materials. This includes submitting the required documentation demonstrating compliance with the national by-product criteria.

Commit to continuous monitoring and reporting of the imported materials' status and compliance with the acceptance criteria throughout their lifecycle on-site.

Meeting the acceptance criteria for greenfield and uncontaminated soil and stone as outlined in the National By-Product Criteria (Ref No. BO-N002/2024), is crucial for ensuring environmental protection and compliance with regulatory standards. By implementing thorough verification processes, conducting comprehensive testing and adhering to quality control measures, stakeholders can effectively manage the import of these materials while promoting sustainable practices within the circular economy.

3.5 Development Design and Management

3.5.1 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 sand and gravel pit will occur up to one hour before and after processing operations – i.e. between 07:00 – 19:00 on weekdays and 07:00 – 15:00 on Saturdays. This allows for the departure of HGVs loaded the previous day and ensures returning HGVs can access the Site at the end of the day.

The former sand and gravel pit currently employs four to five staff members and this is not expected to change with the Proposed Development. Any potential indirect employment effects, such as demand for hauliers or local services, would depend on operational needs and market conditions.

3.5.2 Car Park

Car parking facilities for on-site personnel and hauliers will be maintained within the former sand and gravel pit near the Site office. No additional parking is proposed as part of the Proposed Development.

3.5.3 Welfare

The Site office within the former sand and gravel pit will provide welfare facilities for the Site. This building contains a canteen, toilet and sink. No additional welfare facilities are proposed as part of the Proposed Development. All foul wastes are collected in a container which is emptied by a NWCPO authorised waste collector for onward disposal at an authorised waste facility.

3.5.4 Drainage

The extension area for the Proposed Development is not bounded by any land drains, streams or rivers. Rainwater across the Site percolates into the ground. The main sources of water at the Site will be surface water runoff and process water from the screening and washing processes. To manage this, a water management pond with a capacity of 2,340m^3 will be built following initial phase extraction, after Phases One and Two are completed. The settlement pond will collect water from the sand and gravel floor and process water from the screening and washing plant. No water will be discharged off-site; instead, it will be directed to the settlement pond for reuse. Drainage is further assessed in Chapter 8 – Water (Hydrogeology and Hydrology).

3.5.5 Settlement Pond

The proposed settlement pond, situated in the northeastern section of the Proposed Development, will be designed with a total capacity of approximately 2,340m³. It is intended to provide 24 hours of hydraulic retention time for recycled water from the wash plant, enabling the effective settling of suspended solids within a three-chamber configuration.

To maintain consistent water levels, the pond will be recharged by water from the on-site well (Well Two) and collected rainwater. Each chamber will accommodate approximately 720m³ per day, ensuring efficient retention and treatment. The system is designed to improve water quality for reuse, accommodate variations in flow and load, and support optimal sedimentation processes. Refer to Chapter 8 – Water (Hydrogeology and Hydrology) for further details.

3.5.6 Processing Plant and Operations

The processing plant for the Proposed Development will comprise both dry and wet screening plants, located within the sand and gravel pit floor. The dry and wet screening processes will work in sequence to process excavated sand and gravel aggregates. The dry screening plant will be semi-mobile and will follow the working face. This plant will be active from the initial Phase One works on both the upper and lower benches. The semi-mobile washing plant will be placed on the pit floor during Phase Two and kept near the water management ponds.

An excavator will remove the extracted material, which will then be transported to the dry screening plant by a loading shovel. A dry screener will be used to scalp materials before they undergo further processing. Any material requiring washing will then be transferred to the wash plant. The wash plant assessed in this project has the capacity to process 100-120 tonnes per hour ('t/hr') and is capable of washing two grades of sand and two grades of pebble.

The washing process will require 150-180 cubic meters per hour (m^3/hr) of water, with 75-80% of this water being recycled on-site, while the remaining 20-25% will require additional top-up.

The Applicants propose to extract ca. 800 tonnes per day ('t/day'), with the wash plant processing 400t/day, operating for ca. four hours per day based on plant efficiency and water availability. Any remaining material that cannot be processed due to water supply limitations will be subjected to dry screening and/or stockpiling only.

3.5.7 Water Supply

A review of on-site wells and surface water was conducted to assess the water supply. The nearby river, due to its protected status (refer to Section 6.4), is unsuitable for abstraction.

Two groundwater abstraction wells were installed on-site in November 2021, with initial one-hour pump tests showing a low yield from Well 1 (0.36 m^3/hr) and a higher yield from Well 2 (2.05 m^3/hr).

To further assess Well 2, a two-stage evaluation was conducted in November 2024, including a step test followed by a 72-hour constant rate discharge test. The testing concluded that an abstraction rate of ~1 m^3/hr from Well 2 is achievable.

Refer to Chapter 8 – Water (Hydrogeology and Hydrology) for further details.

3.5.8 Weighbridge and Wheel Wash

The weighbridge and wheel wash located within the former sand and gravel pit, just after the internal access road and adjacent to the Site office, will be used as part of the existing infrastructure at the Site of the Proposed Development. HGVs associated with the Proposed Development will utilise the existing weighbridge and wheel wash prior to exiting the Site.

The existing wheel wash comprises an enclosed water recycling system designed to minimise water wastage and enhance efficiency.

The wheel wash consists of a concrete-lined ramp supplied by recycled water from a wheel wash drainage system to a bulk water tank. During prolonged dry weather, the water supply can be topped up from the well. The wheel wash will be cleaned regularly, with sludge removed off-site in compliance with relevant waste regulations.

3.5.9 Fuel and Oil Storage

No fuel will be stored within the Site. Any oils and/or lubricants required for the diesel generator will be stored in the proposed shed on-site. The diesel generator will be housed inside the proposed 3.0m by 8.0m shed, located in close proximity to the water management pond. An 8.0m by 8.0m concrete plinth will serve as the surface area for the generator shed. Refuelling of mobile plant will be carried out via the fuel bowser.

A drainage line will direct runoff from the plinth through an oil / water separator before discharging into the water management pond, ensuring that the risk of potential contaminants is removed.

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

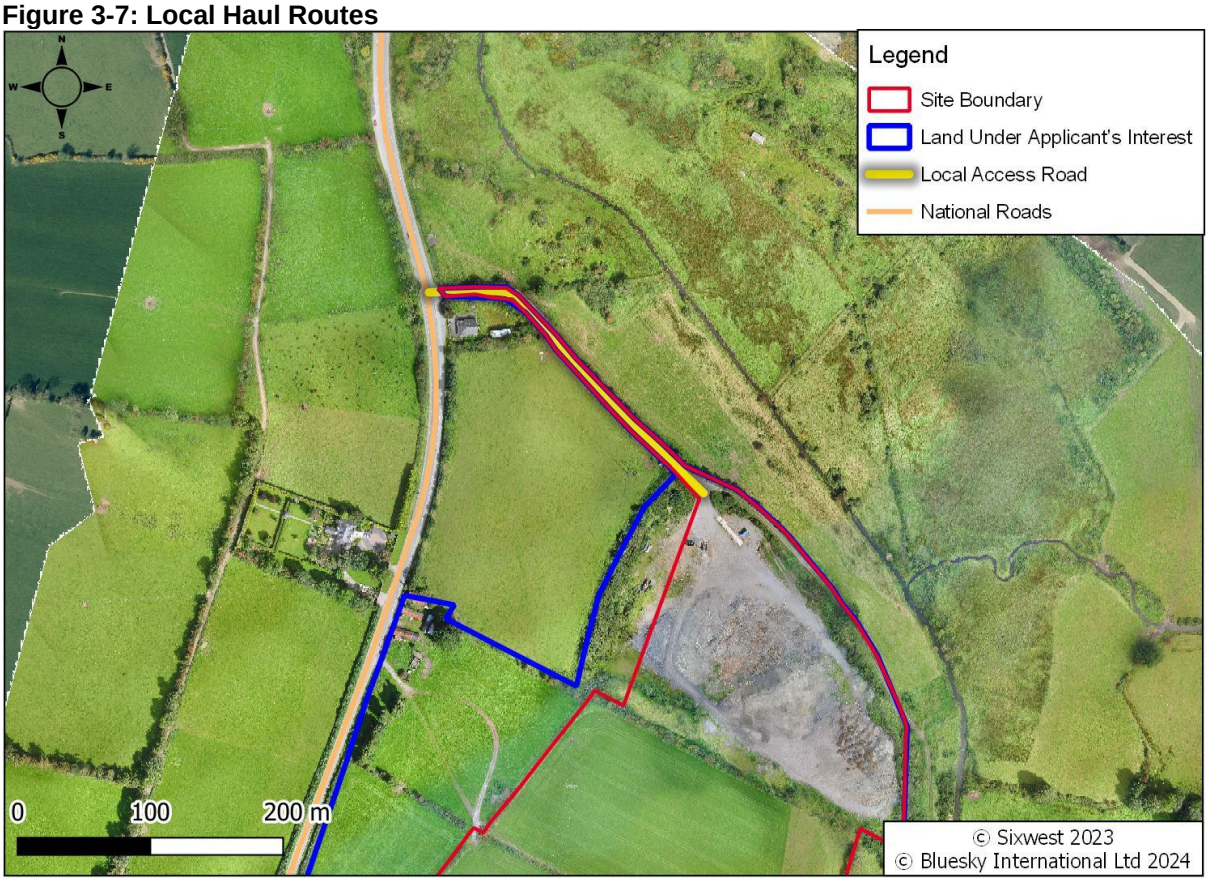
Nonetheless, environmental risks to soils and groundwater and relevant mitigation measures are outlined in Chapter 7 (Lands, Soils and Geology) and Chapter 8 (Water).

3.5.10 Transportation, Roads and Traffic

The Proposed Development will utilise the existing access through the N81 national secondary road and the internal local access road, which connects the former sand and gravel pit entrance to the N81.

The Site is bounded by the N81 to the west, which serves as the access route. As a result, the existing infrastructure will be used for accessing the area corresponding to the Proposed Development. HGVs will travel via the N81 to access the Site, with return trips following the same route, refer to Figure 3-7 below.

Figure 3-7: Local Haul Routes



A total of 96 daily trips (inward and outward) are expected to be associated with quarry operations, of which 82 movements will be HGVs (85.42%), ten will be staff-related and four will be miscellaneous trips, associated with the operational stage of the Proposed Development.

A Traffic Impact Assessment has been undertaken by PMCE, the findings of which are presented in Chapter 13: 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.

3.5.11 Safety and Security

Access to the Site will be via the former sand and gravel pit entrance off the N81 road, refer Figure 3-7. The entrance will be gated and secured when activities are not occurring within the Site.

Hedgerows and/or stock fencing will be present on all other boundaries of the Site.

As part of the Proposed Development, the extension area will be developed and additional fencing prior to activities commencing. 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 operator. Signs will be maintained along the perimeter of the fence and access gate providing notice of the extraction activities.

4 CONSIDERATION OF ALTERNATIVES

4.1 Introduction

The Planning and Development Regulations 2001 (as amended) specify the information to be contained within an 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.'*

This chapter outlines the main alternatives evaluated during the evolution of the Proposed Development at Whitestown Quarry.

- 'Do-nothing' scenario;
- Alternative site locations;
- Layout and design alternatives;
- Extraction methods; and,
- Restoration strategies.

This analysis demonstrates how environmental protection was integrated into the design of the project and how the preferred option emerged through a combination of environmental, technical, operational and planning considerations.

4.2 The "Do-Nothing" Scenario

Under the 'do-nothing' scenario, the proposed extension would not proceed, and the greenfield lands would remain in agricultural use. The existing WFP would continue to operate within its permitted limits, and the restoration of the worked-out area would proceed in accordance with existing planning and waste facility permits.

This alternative would avoid the direct environmental impacts associated with further extraction. However, it would also mean that a known, high-quality aggregate resource would remain undeveloped despite being adjacent to a former sand and gravel pit with suitable infrastructure. In turn, this could place increased pressure on alternative aggregate sources in the region, some of which may not benefit from the same level of environmental screening or operational integration.

Furthermore, it would represent a missed opportunity to complete the restoration and visual integration of the wider landholding under single ownership, including the potential to create

enhanced biodiversity and landscape features. The 'do-nothing' scenario, while environmentally neutral in the short term, does not align with sustainable development principles or the regional demand for construction materials.

4.3 Alternative Location

The Applicant holds a landbank within the area corresponding to the Proposed Development. An agreement is in place with Mr Joseph O'Neill to facilitate access to the Proposed Development through the former sand and gravel pit, which currently operates as a WFP.

As discussed in Section 2.4.2, the location 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 area corresponding to the Proposed Development contains high-quality aggregates, with no zoning restrictions or planning infringements that would prevent excavation. The Site benefits from strong local connections to the primary road network, facilitating efficient service to West Wicklow, as well as parts of Kildare, Dublin and Carlow. Additionally, there are relatively few sensitive receptors along the haul route to regional and national roads.

Expansion to the north is not viable, as this area is part of the former sand and gravel pit where aggregates have already been excavated and is currently used for importing waste soils under a WFP site. Expansion to the east is constrained by a notable loss in ground elevation and by the Carrigower River, while potential lands to the west are limited by a notable loss in ground elevation and the N81 road and residential dwellings.

The agricultural fields to the south of the WFP remain greenfield sites with no previous planning history. These fields are set back from the N81 road and residential dwellings, making them a viable extraction area for the Proposed Development.

Given these constraints, extending the quarry into the lands proposed is considered the only viable option for the Applicants in their landholding.

4.4 Alternative Layout and Phasing Options

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

The greenfield lands have existing access via agricultural entrances onto the N82 to the west. However, these are not designed for regular HGV ingress and egress. Similarly, developing a quarry into the greenfield lands, directly from the N82, would have required additional screening measures to achieve what the current design achieves in terms of visual screening. Additionally, efforts have been made on the adjoining site regarding restoration that can be supported through the Proposed Development, incorporating the WFP into the design and direct moving of surplus soils from the greenfield site into the WFP restoration project.

Additionally, new infrastructure such as a wheel wash to prevent material tracking onto the road and weighbridge would be required. The presence of two separate access points would also contribute to increased local traffic. Therefore, the proposed access track is designed as an extension of the former sand and gravel pit track, avoiding sharp turns and maximising the use of existing infrastructure by directly linking into the former sand and gravel pit.

The expanded project proposal aimed to remove all boundaries and level the hill to match the surrounding terrain. Although this project could reduce the visual impact using berms, it was found to have additional ecological effects, especially on the eastern and northern boundaries of the greenfield areas, and visual impacts from the west, north and east would be more significant than the adopted approach.

Ultimately, the adopted layout begins with extraction in the northern portion of the extension area (Folio WW2198), progressing southward in a phased manner. This approach allows for the early establishment of drainage and settlement infrastructure and enables progressive restoration of worked-out stages. Access to the extension area is provided through a targeted breakthrough in the ridge separating the former sand and gravel pit and extension lands, thereby avoiding the need for new external haul roads.

The pit design incorporates benches at 153mAOD and a final extraction level at 143mAOD, with slopes at a gradient of 1:1.5. This ensures long-term stability, supports stormwater management and facilitates restoration. The phasing strategy also allows for ongoing environmental monitoring and responsive mitigation during active operations.

4.5 Alternative Extraction Methods

A range of extraction and processing methods were considered in the development of the Proposed Development, with the aim of identifying a technique that optimises operational efficiency while minimising potential environmental effects. The assessment took into account the nature of the resource, the hydrogeological setting, the site's proximity to sensitive receptors and compatibility with the former sand and gravel pit infrastructure.

The sand and gravel deposits present within the extension area are unconsolidated and dry, making them particularly amenable to conventional excavation using tracked excavators and front-end loaders, with screening and washing carried out on-site. The extraction will occur entirely above the established groundwater table, and as such, does not necessitate any active dewatering, sump pumping or other intrusive groundwater management techniques.

Three primary extraction strategies were reviewed during project planning:

- Dry Extraction Only (without washing): This approach would involve mechanical excavation and dry screening to produce aggregates. While this method will be employed on the Site, it limits the full potential of the resource present in terms of its market opportunity. The use of semi-mobile plant allows the processing to be kept in proximity to the working face;
- Dry Extraction with On-Site Wet Processing (Preferred): The selected method involves dry excavation with the incorporation of both dry and wet screening processes. A mobile wash plant will be installed on the pit floor and integrated with a water recycling system. Approximately 75–80% of water used in the washing process will be recirculated through the settlement pond, significantly reducing freshwater demand. Water supply will be augmented using an existing on-site well (Well Two), which has been hydrogeologically assessed for sustainable use. Although the plant is mobile, the wet screening plant will be connected to the proposed on-site water management system; and,
- Dry Extraction with Fixed Processing and Conveyor Systems: A fixed processing plant and conveyor system were considered, similar to larger-scale quarries. While this

method can improve throughput and reduce vehicle movements, it requires a larger physical footprint, higher capital investment, and more intensive site preparation. It was deemed excessive and unsuitable given the modest scale and phased nature of the Proposed Development.

Blasting, crushing or any form of hard-rock extraction methods were ruled out early in the process as they are entirely unnecessary for the type of aggregate present.

The selected extraction and processing methodology represents a balance between technical feasibility, environmental sensitivity and resource efficiency. It supports compliance with best practice quarry management and environmental protection standards, particularly in relation to dust suppression, water conservation, noise minimisation and flexibility during phasing and restoration.

4.6 Alternative Restoration

Restoration is a key component of the Proposed Development and was carefully considered at the early planning stage. Two restoration pathways were evaluated:

- A structured reinstatement to agricultural use; and,
- A more passive, nature-led rewilding approach.

The preferred option involves a progressive restoration of the Site to agricultural grassland, complemented by the creation of a permanent wetland feature around the settlement pond.

This approach supports soil reuse, biodiversity enhancement and landscape integration. Stored topsoil and imported inert material will be used to regrade the Site, stabilise quarry faces, and re-establish hedgerow boundaries. The resulting landform will be both functional and visually compatible with the surrounding rural setting. The wetland will provide additional habitat value, contributing to the site's long-term ecological resilience.

In contrast, a passive rewilding approach was deemed less predictable and potentially less effective in delivering safe, stable, and ecologically diverse outcomes, particularly on exposed quarry faces.

4.7 Summary of Justification of Preferred Alternative

The design of the Proposed Development has been informed by a comprehensive evaluation of environmental, technical, and operational alternatives. The selected approach enables the sustainable use of a significant aggregate resource while minimising new land take, infrastructure requirements, and associated environmental impacts.

By extending a former sand and gravel pit, the development consolidates operations, enhances restoration outcomes and maximises the reuse of infrastructure. The phased layout, above-water table extraction and integrated restoration design collectively represent a balanced and environmentally responsible solution. The approach also aligns with key principles of sustainable development and ensures the continued supply of essential construction materials in a managed and accountable manner.

5 POPULATION & 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 stages 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 population, change over time in population, employment levels and human health indicators.

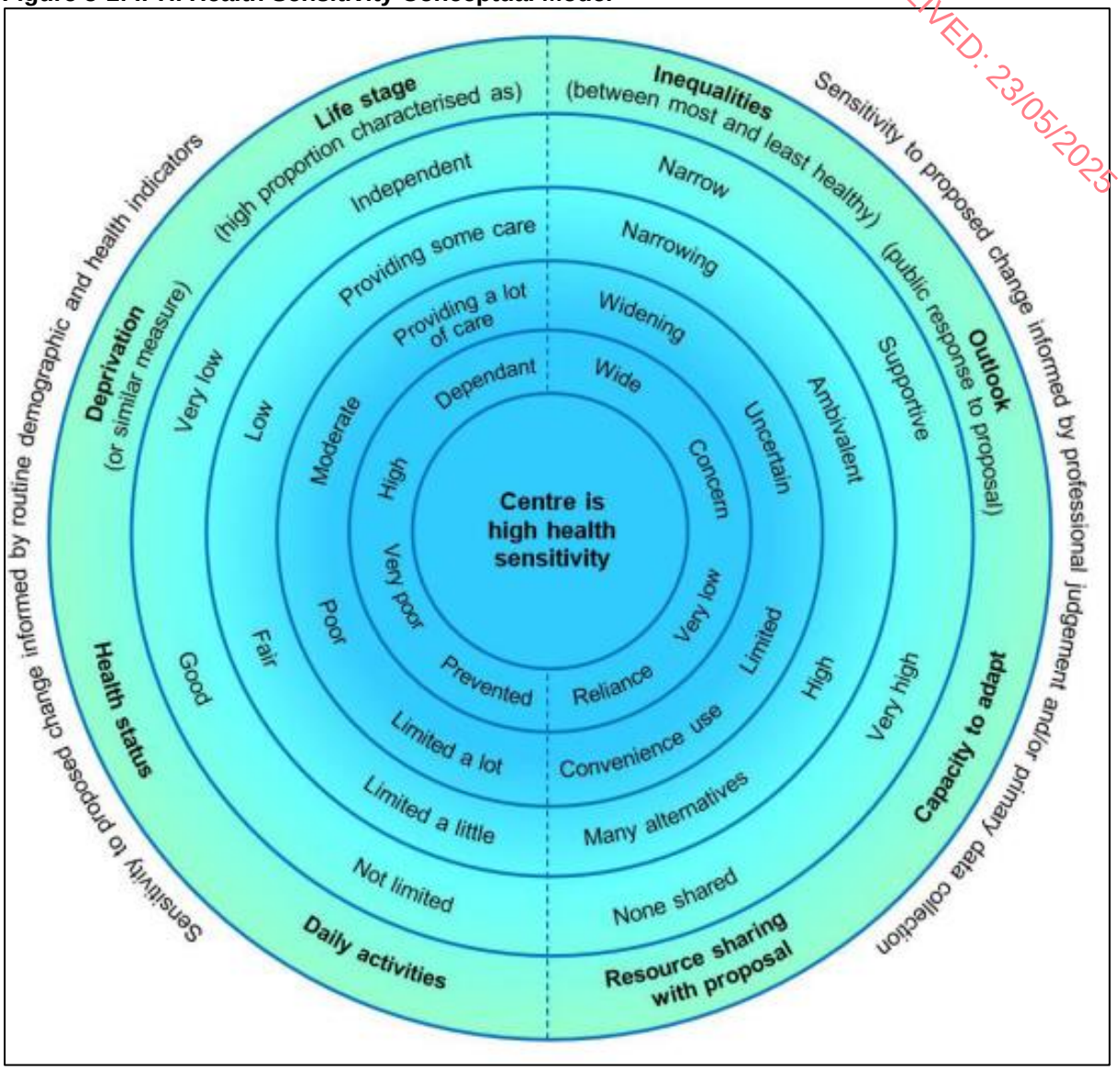
This chapter has been prepared taking cognisance of the guidance set out in Chapter 1 and the following specific guidance documents:

- Guidance on the information to be contained in Environmental Impact Assessment Reports [12];
- Health Impact Assessment Guidance (Institute of Public Health in Ireland ('IPHI') [18];
- Health Impact Assessment in Planning, Impact Assessment Outlook Journal, Vol 8 (Institute of Environmental Management and Assessment ('IEMA') [19];
- Health in Environmental Impact Assessment; A Primer for a Proportionate Approach [20];
- Effective Scoping of Human Health in Environmental Impact Assessment [21];
- Determining Significance for Human Health in Environmental Impact Assessment [22]; and,
- Human Health: Ensuring a High Level of Protection (International Association for Impact Assessment ('IAIA') and European Public Health Association ('EPHA') [23].

5.2.1 Health Sensitivity

In accordance with IPH guidance, the sensitivity of the local population was determined following the methodology set out in Part 4 of the IPHI guidance. This is summarised in the Health Sensitivity: Conceptual Model [18] presented in Figure 5-1 below. The sensitivity in each factor was considered to determine an overall sensitivity for the local population. The results of the analysis are set out in section 5.3.6.1 below.

Figure 5-1: IPHI Health Sensitivity Conceptual Model



Source: IPHI Guidance **[18] 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 then 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.

In addition to the above legislation and guidance, the following sources were consulted and used to determine both the sensitivity of the local population and the potential effects on them:

- Central Statistics Office ('CSO') Census Data for 2011 and 2016 and 2022 [24];
- CSO Census Mapping Small Area Population [25]; and,
- Wicklow County Development Plan 2022 – 2028 [6].

All subsequent chapters of this EIAR have addressed specific direct and indirect impacts that have the potential to impact on human health.

5.3 The Receiving Environment

The receiving environment is presented below under the headings of population, small area statistics, local population, surrounding land use, licensed activities locally, economic activity and employment 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 townland of Whitestown Lower, within the ED of Donaghmore. The boundaries of this ED have not changed between the 2011, 2016 and 2022 censuses.

The closest settlements are:

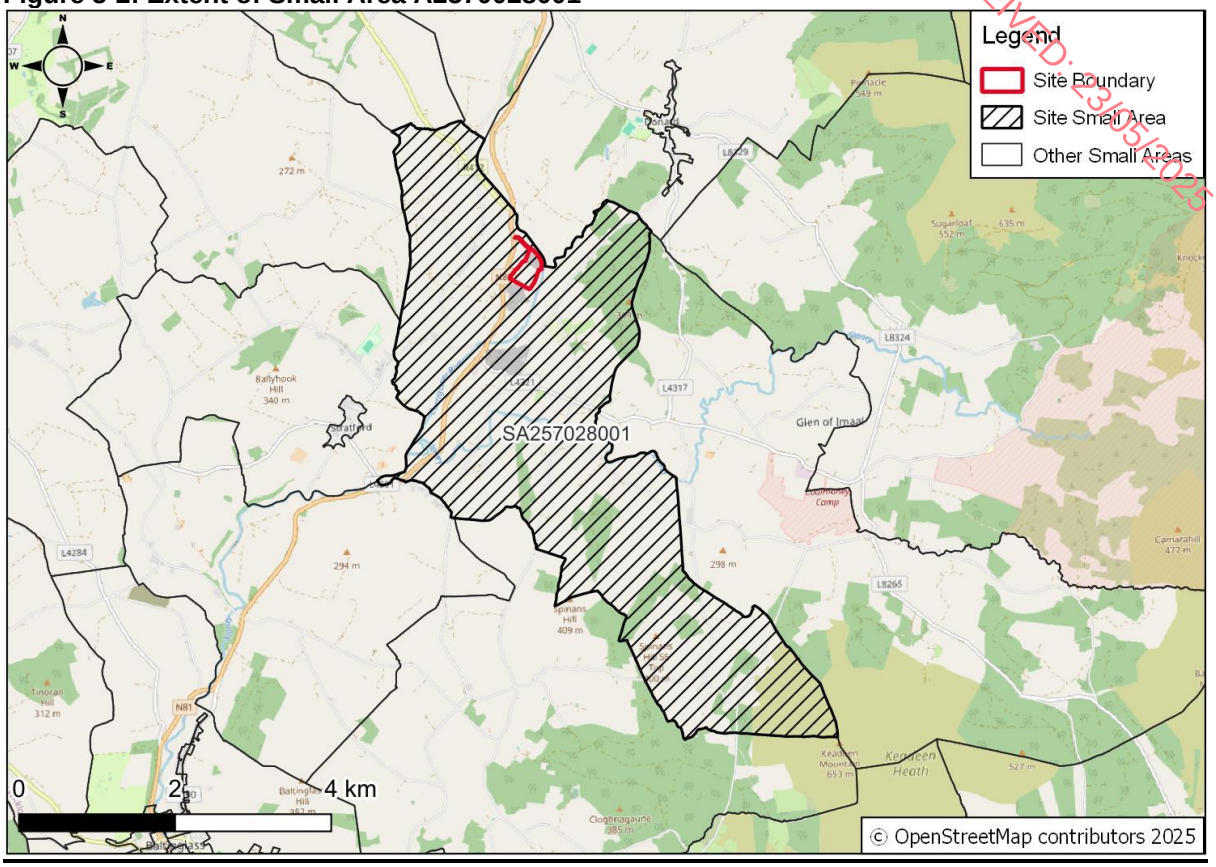
- Donard, situated ca. 2.5km northeast; and,
- Stratford-on-Slaney, situated ca. 3km southwest.

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 A2570028001



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 for these areas.

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%
Co 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%	+12.052%

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 A25708001 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
Registered Permanent 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 (% Male/Female)	463 (50.32/49.68)	211 (44.08/55.92)	238 (48.74/51.26)	155,581 (49.13/50.87)	5,149,139 (49.42/50.58)
Age Distribution Aged 0 - 9 Aged 10 -14 Aged 15 – 19 Aged 20 – 24 Aged 25 – 64 Aged 65 – 79 Aged 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% 7.750% 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%	0%	0%	0.57%	0.64%
Irish BAME/BAME	0.86%	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%	12.051%	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% (17.758%) (9.52%)

Statistics Category	SA257028001	Stratford	Donard	Co Wicklow	Ireland
Central Heating (Electric/Gas) (Oil) (Coal/Wood/Peat)	95.95% (5.40%) (69.59%) (17.57%)	89.66% (2.30%) (72.14%) (14.94%)	94.68% (13.83%) (56.38%) (21.28%)	95.10% (45.61%) (41.43%) (6.14%)	93.84% (44.40%) (38.79%) (8.86%)
Water Supply (Mains) (Private) (Group)	98.65% (16.59%) (72.97%) (4.05%)	100.00% (94.25%) (1.15%) (4.60%)	100.00% (88.30%) (7.45%) (4.26%)	98.51% (79.74%) (16.23%) (2.25%)	97.72% (79.90%) (9.90%) (7.69%)
Sewerage (Mains Sewerage) (Septic Tank)	98.65% (2.70%) (80.41%)	100.00% (78.16%) (19.54%)	100.00% (81.91%) (14.89%)	98.24% (72.82%) (20.92%)	94.95% (63.30%) (24.78%)
Health and Disability					
% With a Disability (all ages)	17.71%	22.27%	22.27%	22.77%	21.55%
% Caring for Disabled Person	4.75%	4.74%	6.72%	5.90%	5.81%
% aged 15+ unable to work due to 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%

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 Decription	Marginally Above Average	Marginally Below Average	Marginally Below Average	Marginally Above Average

Indicator (2022)	SA257028001	Stratford	Donard	Co.Wicklow
Age dependency ratio (%)^	40.17%	33.18%	38.66%	35.88%
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% [24]

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 [24]

*The national unemployment rate for (Q2) 2022 was 4.5% for males and 4.5% for females [26]

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 Decription	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 Site is located within an area where the predominant land use is agricultural.

The west of the Site is bounded by and accessed via the N81 road.

The northern and eastern boundary of the Site are adjacent to the Slaney River Valley SAC. The Brown's Beck (Brook) River is located ca. 50m northeast of the Site, which flows in a northeast to southwest direction and joins the Carrigower River at ca. 40m from the Site's northeastern boundary. A small portion of this SAC is within the Site and relates to a restoration plan authorised by WCC that this Proposed Development looks to further facilitate.

See Figure 5.3 below, which shows SAC relative to the Site, and Figure 5-3, which shows land use in the surrounding area.

There are former quarries ca. 625m to the southwest and ca. 410m southeast of the Site. See Figure 5-6.

Figure 5-3: Slaney River SAC relative to the Site

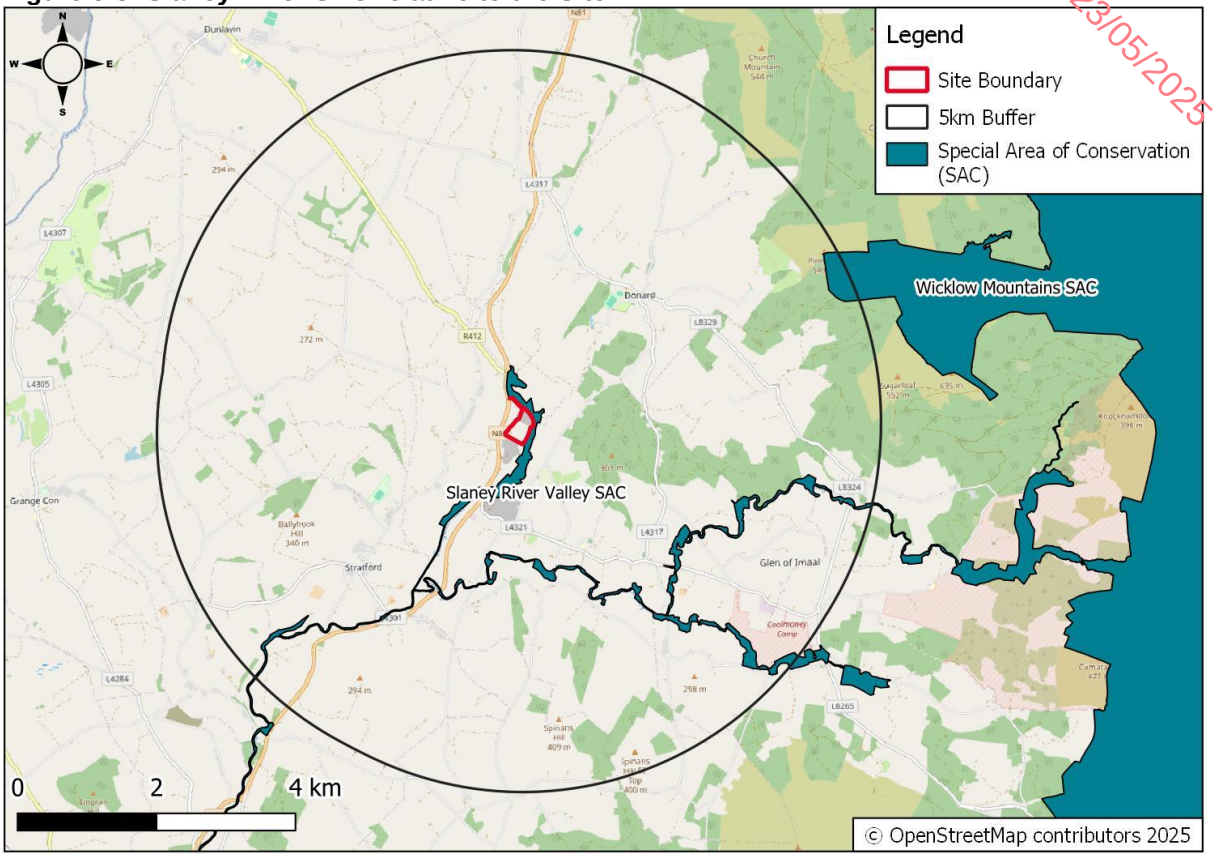
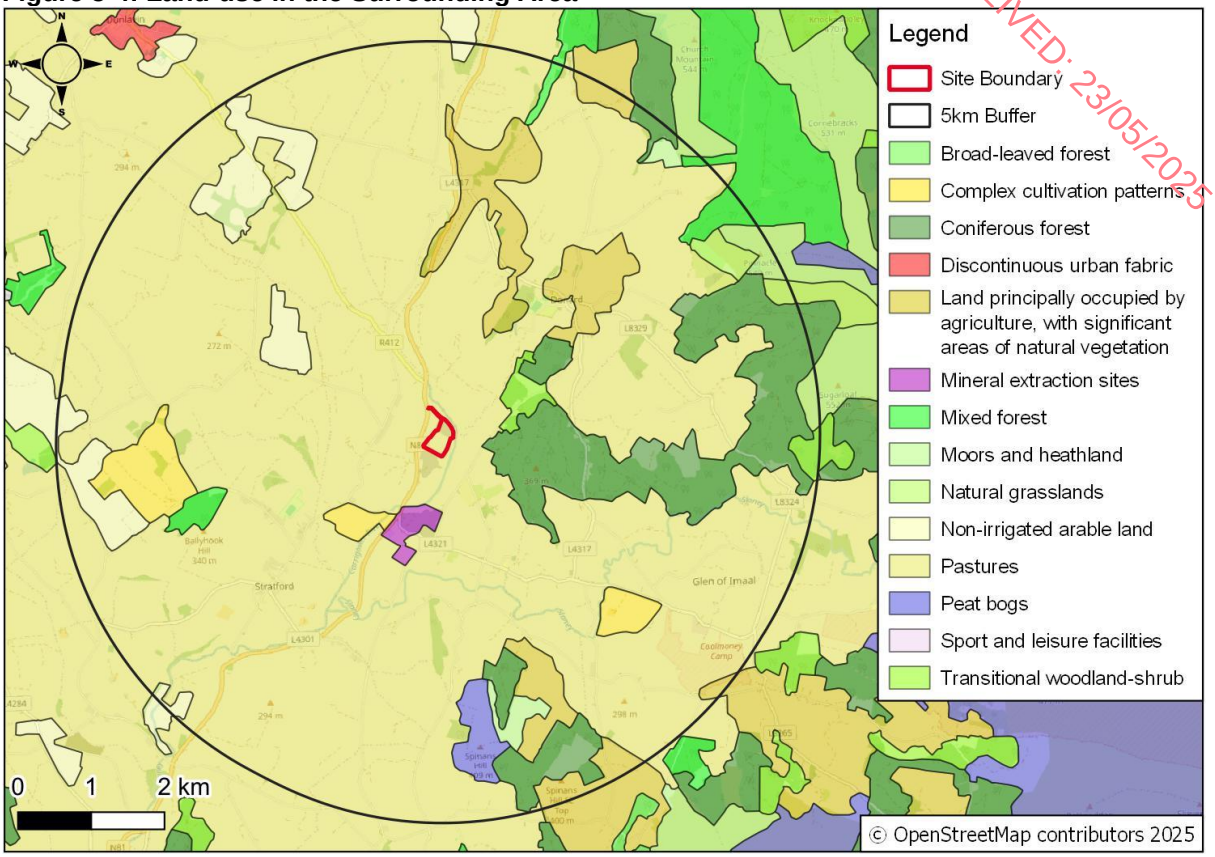


Figure 5-4: Land-use in the Surrounding Area

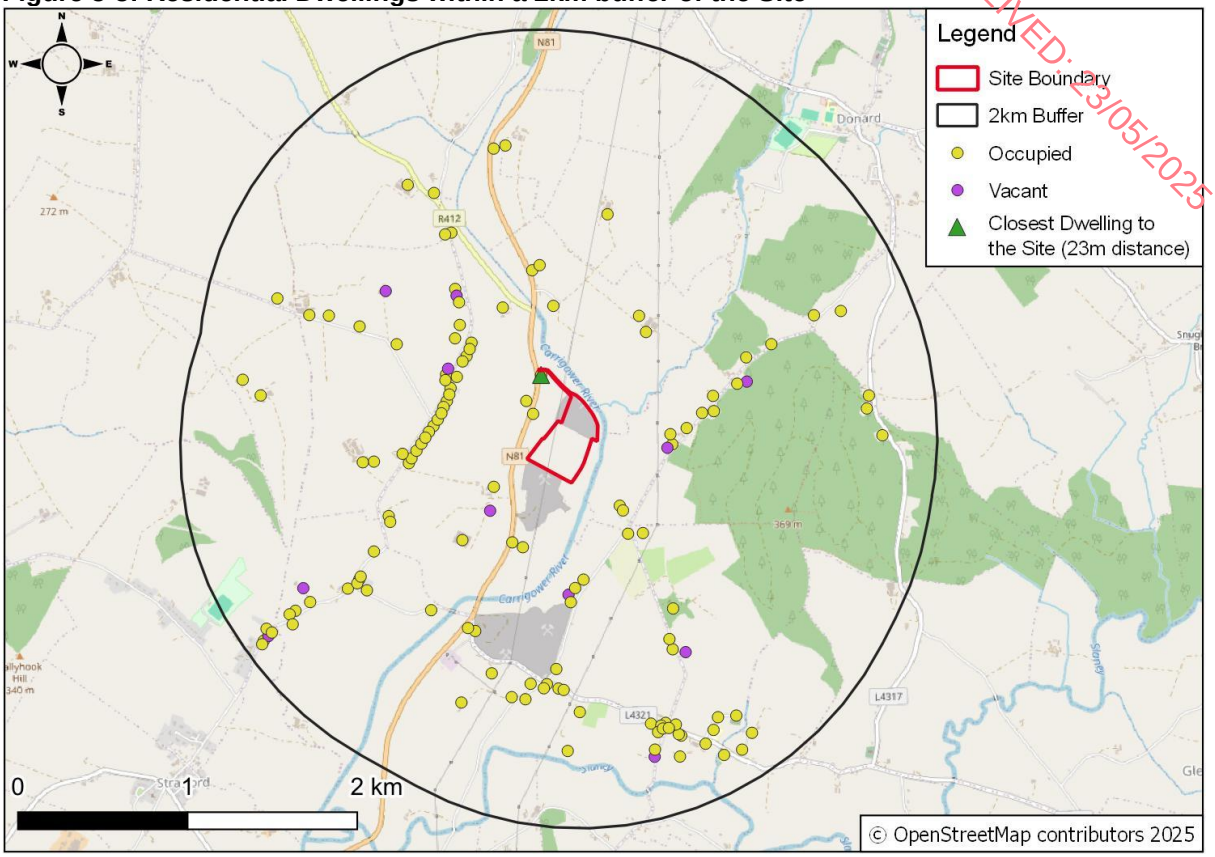


5.3.3.2 Residential Development

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 is a dwelling directly outside the western boundary, ca. 23m from the Site.

There are ca. six residential and business properties within 350m of the Site, with additional linear one-off residential dwellings in Whitestown Lower, located ca. 1km west of the Site. The Old Rectory holiday accommodation complex lies ca. 330m southeast of the Site boundary. Figure 5-5 below presents residential dwellings within 2000m of the Site [27].

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



The nearest settlements are:

- Donard, lying ca. 2.5km northeast is accessed off the N81 (north of the Site) and an unnamed road; and,
- Stratford, lying ca. 2.5km to the south is accessed from the Site via the N81 and the L4301.

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

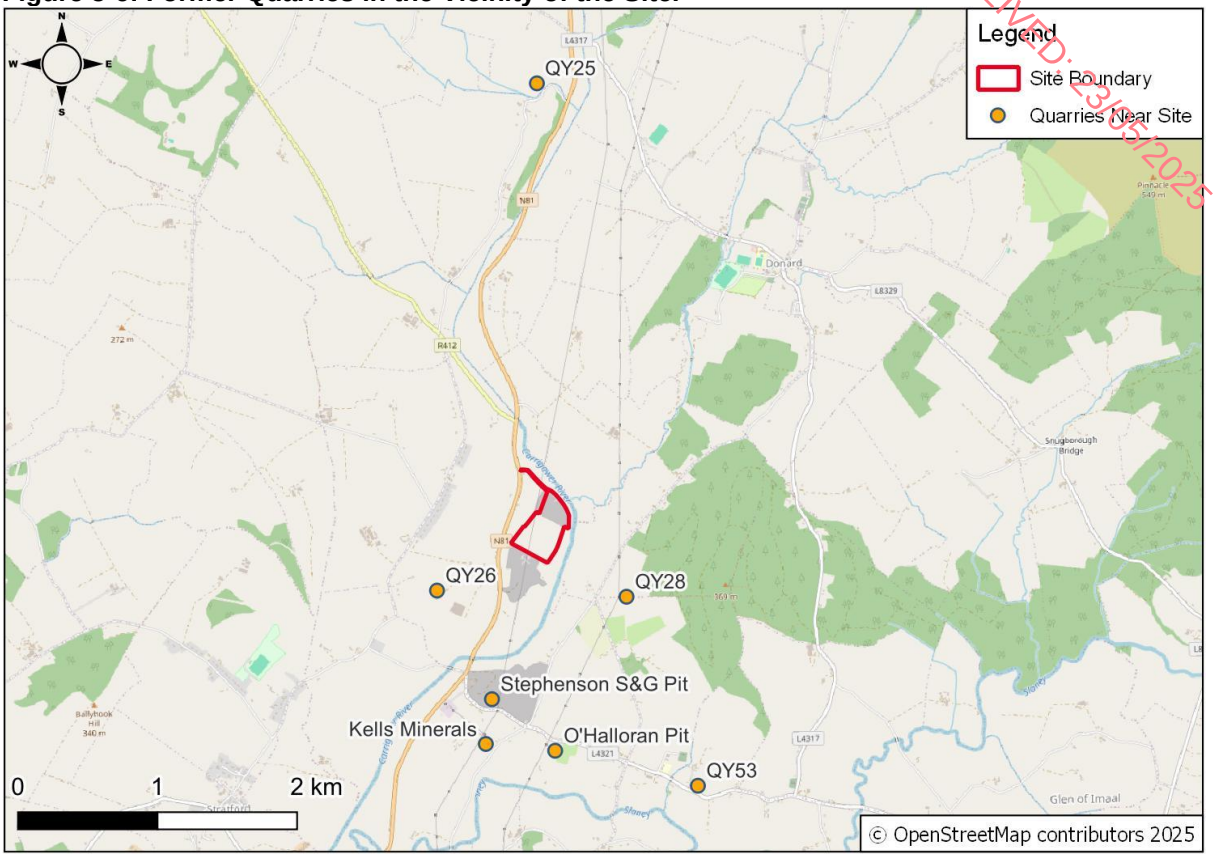
Stratford includes a preschool, a National School and a GAA club.

Donoughmore National School is located just east of Castleruddery Crossroads, ca. 1.8km southeast 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 5-6 below).

Figure 5-6: Former Quarries in the Vicinity of the Site.



QY25

This is a disused and remediated quarry of pre-1964 origins, located 2.7km north of the Site.

QY26

This is a former quarry known locally as O'Reilly's Pit, located on the western side of the N81, ca. 625m southwest of the Proposed Development. 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 [28]. 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 [28].

At some point in the 1970s, the Site began to be used as an illegal landfill [28]. In 1989, complaints were made to WCC regarding the illegal waste deposits, and in 2001, WCC closed the Site [29]. On 20th January 2005, it was listed as QY26 on Wicklow Council's list of S261 quarry registrations [30]. 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 (Planning Ref. 052224). Planning was initially refused, but after an appeal to ABP (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 [28].

As part of the application process, WCC informed the EPA that Brownfield should be required to remediate the entire site [29]. 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 (March 2025). 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 [31].

On 29th April 2024, the EPA issued a public notice announcing that a Technical Amendment to the licence [32] was to be made to incorporate the requirements of the Best Available Techniques conclusions on waste treatment

A high court order was issued on 8th May 2024. See Brownfield Restoration Ireland Ltd vs WCC and Others (2024) IEHC 260.[2] It delivered:

> *21. Motions (i) to (iv) above are currently live. The order in which they were to be dealt with at the hearing of 18th April 2024 was to be as follows:*
>
> *(i) finalise issues regarding expert including formal appointment;*
>
> *(ii) contempt; and,*
>
> *(iii) costs motions, with the discussion assisted by the Scott Schedule.*
>
> *22. These matters were heard, broadly in that order, on 18th and 19th April 2024 when judgment was reserved.*

In relation to the appointment of the expert, the judgement noted:

> *37. Following the finalisation of the list of duties and the contractual terms, the terms of engagement including these duties are to be formally agreed to by Arup who, subject to that, will stand appointed.*
>
> *38. The next step will be for the assessor to advise on the balance of the remediation plan and the timescale for full remediation. Obviously the decision remains with the court but in principle it would be desirable if the expert, once appointed, would liaise with both sides with a view to narrowing the issues and reporting to the court.*

QY28

A former pre-1963 quarry development which has ceased operations following expiry of a 5-year planning permission that was granted in 1991 (Planning Ref. 90/006374). It was registered under S261 of the Planning and Development Act as QY28 and identified as a basalt rock quarry. It is located ca. 410m southeast of the Proposed Development and ca. 2.5km southwest of Donard. 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.

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.

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.

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 five 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.

[2] https://ie.vlex.com/vid/bownfield-restoration-ireland-ltd 1035033316

A further planning application 2560046 (WCC), received by WCC on 29th January 2025, was submitted by Herbie Stephenson Limited. The application seeks permission for the re-commencement and extension of a previously approved quarry within the townland of Deerpark and Donaghmore, Co. Wicklow, covering an area of ca. 8.1ha. The proposal included reopening a ca. 2ha quarry, expanding extraction by ca. 5.01ha, and implementing blasting, rock extraction, crushing and screening. Infrastructure upgrades such as an improved site entrance, office facilities, a weighbridge and haul routes are also planned. A 25-year permission is sought, with a Restoration Plan to follow upon completion. The Client has applied for an extension of time on the process with the timeline for a final decision due on this application on 24th September 2025.

QY53

This is a disused quarry to the east of Castleruddery Crossroads, ca. 1.8km southeast of the Site boundary. It was worked in 1999, as retention permission was granted at this point (Planning Ref. 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 Ref. 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. 1.3km 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 Ref. 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. 1.4km 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 Licenced 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 Licenced Sites

Licence No.	Licence Type	Distance/Direction from Site
W0204-01	Industrial Emission Licence ('IEL')	Adjacent to the Site southern boundary
W0181-01	Waste Management Licence ('WML')	ca. 2.8km southeast
A0533-01	Waste Water Discharge Certificate of Authorisation ('WWDCA')	ca. 3.0km southwest
A0197-01	WWDCA	ca. 2.5km 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 Industrial Emission Licence ('IEL') site within 4km is W0204-01, which is for a site located adjacent to the southern boundary of the Site (see section 5.3.3.3 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 (March 2025) 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.

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 2.8km southeast of the Proposed Development. The licence was granted on 21st August 2003, 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[3] 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[4].

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.

[3] 'this Schedule' herewith means the Third Schedule of the Waste Management Act 1996
[4] 'this Schedule' herewith refers to the Fourth Schedule of the Waste Management Act 1996

Table 5-7: WML Site W0181-01 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

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 (March 2025), 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 and 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 of people unable to work due to illness or disability is well below the national figure.

Table 5-8: Principal Economic Status (2022)

Sector	A257028801	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%	7.754%	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 in building and construction.

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

Sector	A257028801	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	A257028801	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%	13.7%	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%	12.058%	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% [24], 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	A257028801		Co Wicklow		Ireland	
	Work	Education	Work	Education	Work	Education
On Foot	3.90%	1.61%	6.6%	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%
1 hr +	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

The Proposed Development will allow the Applicant to continue to offer local employment opportunities for the lifespan of the extended Site, up to 20 years. The Proposed Development will not increase the employment levels at the quarry, as it currently employs 4/5 employees.

5.3.6 Human Health

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

We are unaware of any known accidents either in the Whitestown Quarry whilst it was operating, or in the northern portion of the Site, which has operated under the WFP.

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 identifies 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

Criteria	Classification	Sensitivity Level	Basis for Selected Classification
			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 ca 330m to the southeast of the Proposed Development. A nearby planning application on a former quarry in 2022 received fifteen submissions opposed to it on the 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 ongoing legal conflict over another 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 may be 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 that no additional employment is anticipated within the Quarry operations by the Proposed Development, other than the services of external maintenance, professional and delivery the capacity of health services in the local area is highly likely to adapt to any small increased demand.
Resource sharing with this proposal	None shared	Negligible	The Proposed Development will not have high water or power needs. The water supply on-site is sourced from groundwater wells and is independent of mains water. In addition, all the immediate local residents rely on private water supply and septic tanks. In terms of traffic, the trips associated with the operation of the proposed quarry were found to have an imperceptible impact on the link capacity of the N81 National Road, and the junction capacity of Site Access Junction. Traffic impact is detailed further in Chapter 13.
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 (a 2022 planning application in a nearby site received numerous objections, and it is likely that objections may be raised again as they relate to a quarry development in principle at this general 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 5-5 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 stages 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 stages are detailed under the headings Construction Stage and Operational Stage, below.

5.4.1.1 Construction and Operational Stage

Structured Phasing Plan

The construction and operational stages will be structured in different phases (phases 1 to 4), with each phase involving both preparatory construction activities and subsequent aggregate extraction.

The Proposed Development will be divided into two sections—northern (Folio WW2198) and southern (Folio WW31829F)—separated by an existing hedgerow running west to east. The extraction works will be phased accordingly over the operational lifetime of the quarry.

The Construction works will involve preparing the greenfield agricultural lands within the Proposed Development, extending south from the former sand and gravel pit for aggregate processing activities. Initial works include removing intervening hedgerows between the former sand and gravel pit and the extension area of the Proposed Development, breaking through the boundary ridge between the former sand and gravel pit and extension lands to establish an entrance into the quarry resource.

As outlined in Chapter 3, due to the phased structure of the Proposed Development, the construction and operational stages of the development will be considered together rather than separately. In view of unforeseen future economic and market needs, they are expected to take 15 to 18 years, followed by an additional two years for the restoration stage, therefore providing employment for the existing employees over this period. There will also be indirect employment of maintenance personnel, which 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 Stage, Operational Stage, Restoration Stage, Safety and Unplanned Events.

5.4.2.1 Construction Stage

As mentioned above, the construction and operational stages will be intertwined, whereby phases of the Proposed Development will involve both preparatory construction activities and subsequent aggregate extraction. The Construction and Operational Stages of the Proposed Development are expected to last up to 15 to 18 years, with an additional two years for the restoration stage.

The Construction works involve preparing the greenfield agricultural lands within the Proposed Development, extending south from the former sand and gravel pit for aggregate processing activities. Initial works include removing intervening hedgerows between the former sand and gravel pit and the extension area of the Proposed Development, breaking through the boundary ridge between the former sand and gravel pit and extension lands to establish an entrance into the quarry resource. Additional infrastructure will also be constructed / installed during the different phases.

The potential impacts on human health arising from the construction works within each 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 13: Material Assets – Traffic and Transport.

5.4.2.2 Operational Stage

The operational works within each phase will include:

- Extraction, crushing and screening of aggregates;
- Stockpiling; and,
- Haulage from the Site.

We are unaware of any known 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 5.3.5 above. Refer to the specific chapters for further details.

<u>Chapter 6: Biodiversity</u>

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 a nearby quarry planning application in 2022 included local appreciation of and concern for the biodiversity within that 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 stage and operational stage 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 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 findings 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 the standard EPA & ICF limit (55dBA) from quarries for noise at all properties. Similarly, normal operations at the Site have been found to be neutral.

The effect of the Proposed Development in terms of noise and vibration has been determined to be negligible, local and reversible during the main operational stage of works. Given the 'medium' sensitivity of the population, the impact on the local population is therefore deemed to be not significant.

Chapter 12: Cultural Heritage

A detailed assessment of the Site and Proposed Development has been undertaken and found that there will be no direct or indirect impacts on any known items of archaeology, buildings or

heritage interest or cultural heritage in the application area of the vicinity during the operational, construction or closure stages. In addition, no interaction with other impacts have been identified for the Proposed Development.

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

Chapter 13: Material Assets – Traffic and Transport

Following the link, and junction, capacity assessments, the trips associated with the operation of the proposed quarry at Whitestown, Co. Wicklow, were found to have an imperceptible impact on the link capacity of the N81 National Road, and the junction capacity of Site Access Junction.

Visibility splays were found to be satisfactory when assessed in accordance with the requirements of DN-GEO-03031, though routine maintenance of the verge and hedgerow either side of the quarry's access on the N81 will be required, and an existing sign will need to be relocated further north, so as not to interfere with existing sightlines.

The impact of the proposed quarry, in relation to road safety and the existing road infrastructure, was also determined to be imperceptible.

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

Chapter 14: Landscape and Visual

The Site sits in a contained landscape context that avails of a high degree of existing screening by way of existing hedgerow vegetation and surrounding mature treelines. It is also located in a landscape already influenced by the extractive industry.

The Proposed Development will construct a 3m height berm, which once mature will soften and screen the surrounding landscape and visual receptors. Existing vegetation surrounding the Site will retain the existing landscape structure and screening in the immediate vicinity.

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.

5.4.2.3 Restoration Stage

A Restoration Plan for the Proposed Development will be submitted as part of this planning application to return the land to a productive and environmentally sustainable condition. This is in addition to the ongoing restoration (granted under Planning Ref. 20/1117).

The Site will be reinstated to agricultural grassland, which will incorporate the use of the stored topsoil, which will be removed and appropriately stored as part of the Proposed Development. Multi-species grass swards will be planted, which will be beneficial in terms livestock nutrition and reduce fertiliser requirements.

A managed hedgerow, which will be removed as part of the Proposed Development, will be replanted incorporating an improved mix of species with local and native providence where possible.

The settlement pond which will be constructed as part of the Proposed Development will be enhanced to create a wetland feature onsite.

It is considered that once the restoration plan is fully implemented, the Site will be more biodiverse than it was at the time of the ecological field surveys undertaken as part of this assessment.

5.4.2.4 Safety

The Health and Safety Authority ('HAS') views the quarrying industry as a high-risk sector [33]. 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.

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; 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 against the potential effects which may impact on human health from the Development 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: Acoustics (Noise and Vibration);
- Chapter 13: Traffic; and,
- Chapter 14: Landscape and Visual.

5.6 Cumulative and In-Combination Effects

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

As outlined in section 5.3.3.3 above, the southern boundary of the Site is adjacent to QY26 (W0204-01) site, which is a potential cumulative source of dust and noise, given its 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 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;
- 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 detailed within the individual specialist chapters.

5.11 Reinstatement

See section 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 has been prepared by the MOR Environmental team. This chapter provides a description and assessment of the potential, likely and significant impacts of the Proposed Development on ecology and biodiversity.

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) [34]. In addition, an assessment on potential impacts on European sites was also undertaken and is presented in the Stage 2 Appropriate Assessment - Natura Impact Statement ('NIS') which forms part of the planning application which should be read in conjunction with this chapter.

6.2 Study Assessment and Methodology

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 impacts 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) [34];
- National Road Authority ('NRA'), '*Guidelines for Assessment of Ecological Impacts of National Roads Schemes'* [35]*;*
- '*Guidelines for the Protection of Biodiversity within the Extractive Industry'* [36];
- Fossitt's '*Guide to Habitats in Ireland'* [37];
- Heritage Council's '*Best Practice Guidance for Habitat Survey & Mapping'* [38];
- NRA, '*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*;' [39];
- Scottish Badgers, '*Surveying for Badgers: Good Practice Guidelines*,' [40];
- The Mammal Society, '*Surveying Badgers,*' [41];
- NRA, '*Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes'* [42];
- Bat Conservation Trust ('BCT'), '*Bat Surveys for Professional Ecologists Good Practice Guidelines* (3rd ed)' [43];
- BCT, '*Bat Surveys for professional Ecologists: Good Practice Guidelines* (4th ed)' [44]
- British Trust for Ornithology ('BTO') – '*A Field Guide to Monitoring Nests'* [45];
- Common Bird Census '*Bird Monitoring Methods'* [46].
- Scottish Natural Heritage ('SNH'), '*Technical Advice Note #2: Otter Surveys'* [47];
- DoAHG, '*National Otter Survey of Ireland 2010 / 12'* [48];
- Construction Industry Research and Information Association ('CIRIA'), C532 – '*Control of Water Pollution from Construction, Guidance for Consultants and Contractors'* [49];

- CIRIA, *C811- 'Environmental Good Practice on Site'* (5th edition) [50];
- NRA '*Guidance for the Treatment of Bats Prior to the Construction of National Road Schemes'* [51];
- NRA, '*Guidance for the Treatment of Badgers Prior to the Construction of National Road Schemes'* [52];
- NRA, '*Guidance on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads'* [53]; and,
- '*Requirements for the Protection of Fisheries Habitat during Construction and Development'* [54].

6.2.2 Desk Study

The desk study focused on identifying European 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 in March 2025 as part of the desktop study:

- Review of aerial maps of the Site and surrounding area;
- The National Parks and Wildlife Service ('NPWS') website was consulted with regard to the most up to date detail on conservation objectives for the European sites relevant to this assessment [55] ;
- The National Biodiversity Data Centre ('NBDC') website was consulted with regard to species distributions [56];
- The EPA Maps website was consulted to obtain details about watercourses in the vicinity of the Site [57]; and,
- The WCC Planning Portal was consulted to obtain details about existing / proposed developments in the vicinity of the Site [1].

6.2.3 Field Survey

6.2.3.1 Habitat Survey

An initial habitat survey was undertaken on 8th September 2023 by one suitably qualified MOR Environmental Ecologist, with updated surveys also undertaken on 17th January 2024 and 28th February 2025. These surveys aimed to assess the extent and quality of habitats present on the Site and to identify any potential ecological receptors. All the surveys were undertaken using the Fossitt's Guide to Habitats in Ireland [37] and were conducted in line with the Heritage Council's '*Best Practice Guidance for Habitat Survey & Mapping'* [38].

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 both bats, badgers, birds and otter; please see details below.

6.2.3.2 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.

Flora

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 [58].

Amphibians

The Site was assessed for its potential to provide sheltering, foraging and breeding habitat for amphibians. These include static or slow-moving waterbodies 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. The Site was assessed in line with the NRA, now Transport Infrastructure Ireland ('TII'), '*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes,*' [39].

Badgers

The Site was assessed for areas where badgers might occur. Following the identification of habitat suitable for badger, a targeted badger survey was undertaken on the 28th February 2025.

The survey aimed to identify and examine areas where badgers 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 of the Site was conducted in line with the following relevant guidance for badger:

- Scottish Badgers, '*Surveying for Badgers: Good Practice Guidelines*,' [40];
- The Mammal Society, '*Surveying Badgers*' [41]; and,
- NRA, now TII, '*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*,' [39].

Bats

An initial assessment was carried out during the habitat survey to determine the suitability of the habitats within the Site and provide bat roosting, foraging and flight path habitats. Bat habitats and commuting routes identified were considered in relation to the wider landscape to determine connectivity for local bat populations, and through the examination of aerial mapping. During the most up-to-date habitat survey on 28th February 2025, the Site was assessed in line with the most up-to-date guidance at the time, which was '*Bat Surveys for Professional Ecologists: Good Practice Guidelines* (4th edition)' [44].

Table 6-1: Guidelines for assessing the potential suitability of proposed development sites for bats, based on the presence of habitat features within the landscape, to be applied using professional judgement [44]

Potential Suitability	Description of Roosting habitats in structures	Description of Potential flight-paths and foraging habitats
None	No habitat features on site likely to be used by any roosting bats at any time of the year (i.e. a complete absence of crevice / suitable shelter at all ground / underground levels).	No habitat features on site likely to be used by any commuting or forging bats at any time of the year (i.e. no habitats that provide continuous lines of shade / protection for flight-lines or generate / shelter insect populations available to foraging bats).
Negligible[5]	No obvious habitat features on site likely to be used by roosting bats; however, a small element of uncertainty remains as bats can use small and apparently unsuitable features on occasion.	No obvious habitat features on site likely to be used as flight-paths or by foraging bats; however, a small element of uncertainty remains in order to account for non-standard bat behaviour.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically at any time of the year. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions[6] and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e., unlikely to be suitable for maternity and not a classic cool / stable hibernation site but could be used by individual hibernating bats[7]).	Habitat that could be used by small numbers of bats as flight-paths, such as a gappy hedgerow or unvegetated stream, but isolated, i.e., not very well connected to the surrounding landscape by another habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats, such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only, such as maternity and hibernation – the categorisation described in this table is made irrespective of species conservation status, which is established after presence is confirmed).	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by bats for flight-paths such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape, that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.
High	A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat. These structures have the potential to support high	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved

[5] Negligible is defined as 'so small or unimportant as to be not worth considering, insignificant'. This category may be used where there are places that a bat could roost or forage (due to one attribute) but it is unlikely that they actually would (due to another attribute).

[6] For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.

[7] Evidence from the Netherlands shows mass swarming events of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments ([150] and [151]).Common pipistrelle swarming has been observed in the UK ([152] and [153]) and winter hibernation of numbers of this species has been detected at Seaton Delaval Hall in Northumberland ([154]). This phenomenon requires some research in the UK, but ecologists should be aware of the potential for larger numbers of this species to be present during the autumn and winter in prominent buildings in the landscape, urban or otherwise.

Potential Suitability	Description of Roosting habitats in structures	Description of Potential flight-paths and foraging habitats
	conservation status roost, e.g. maternity or classic cool / stable hibernation site.	woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.

Ground Level Tree Assessment

As part of the walkover, all trees within the Site and adjoining lands were assessed for the presence of features that could be utilised by roosting bats, using close-focusing binoculars and a powerful focused-beam light source.

The following criteria were used to assess mature trees onsite:

- Presence of natural cavities, splits, cracks, loose bark and rot holes in the trunk or boughs of the tree;
- Presence of dense and woody ivy (*Hedera helix*) growth that could be used by bats for roosting;
- Evidence of bat droppings, which may also be seen as a black streak beneath holes, cracks, branches, etc.; and,
- Presence of smooth edges with dark marks and urine stains at potential entrances to roosts.

Following the identification of suitable roosting, foraging and flight path habitats for bats onsite, two dusk emergence and activity surveys were undertaken onsite on 22nd August and 5th September 2023 by two MOR Environmental Ecologists. Full details of the methodology followed during these surveys can be found in Appendix 6-2 – Bat Report, which should be read in conjunction with this chapter.

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. Surveys aimed to identify and examine areas where wintering and breeding birds might occur. Any activity and potential nesting habitats were noted.

Following the identification of suitable habitats for breeding birds onsite, two breeding bird surveys were undertaken onsite on 23rd August and 8th September 2023 by one MOR Environmental Ecologist. Full details of the methodology followed during these surveys can be found in Appendix 6-3– Bird Report, which should be read in conjunction with this chapter.

Otters

The Site and adjacent watercourses, including the Carrigower River, which forms part of the Slaney River Valley SAC, were assessed for evidence of otters during a targeted otter survey on 17th January 2024 and an updated otter survey on the 28th February 2025. The survey aimed to identify and examine areas where otter might occur by noting any evidence of otter observed. Evidence of otter searched for included:

- Holts (features log piles, caves and cavities);
- Slides (flattened areas of mud or vegetation);
- Paw prints;
- Evidence of foraging (usually in the form of feeding remains such as fish scales and shellfish); and,

- Spraints (isolated otter droppings).

The field survey of the Site was conducted in line with the following relevant guidance for otter:

- SNH, '*Technical Advice Note #2: Otter Surveys* [47];
- DoAHG, '*National Otter Survey of Ireland 2010 / 12'* [48]; and,
- NRA, now TII, '*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes'* [35].

Figure 6-1 below shows the extent of the otter survey area. A distance of 150m from the Site was chosen in line with the National Roads Authority (now Transport Infrastructure Ireland) '*Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes'* [59].

Figure 6-1: Otter Survey Area

Invasive species

The Site was visually assessed for the presence of any noxious / invasive species that are regulated under the European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024) [60] 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 based on the findings of the desktop study and professional judgment.

6.2.3.3 Survey Limitations

The breeding bird season is considered to be from the 1st March to 31st August (inclusive). However, the optimal breeding bird survey period is considered to be April – June. As the breeding bird surveys were undertaken in August and September, it is considered that these were outside of the optimum survey season. It should, however, be noted that the onsite habitats, which comprised most of the agricultural grassland, heavily managed hedgerows and the disturbed areas of ground within the waste licence area, would not be considered optimal habitat for rare or notable bird species.

According to CIEEM Advice Note on the Lifespan of Ecological Reports and Surveys, survey data that is 12-18 months old can still remain valid following an updated survey by a professional ecology and updated desk-based assessment to confirm that the Site has not experienced significant change and the local distribution of species in the wider area around the Site has not changed [61]. Following the updated surveys undertaken on the 17th January 2024 and 28th February 2025, it was concluded that onsite habitats and the habitats in the wider area had not changed since 2023 and that the results of the 2023 breeding bird surveys remain valid.

Small area of dense scrub to the east of the Site was inaccessible in some areas during the badger survey on 28th February 2025 due to the presence of gorse and brambles. However, it is not considered that this presents a significant constraint as the areas around the scrub could be fully accessed and are outside of the Site boundary.

No other survey limitations were encountered.

6.2.4 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 and field surveys for the Site. Based on professional judgement data from the following radii were collected: 2km away for protected species, 15km for Natura 2000 sites and 5km away from Natural Heritage Areas. The desk and field-based data was used to determine:

- Which, if any, of the species or habitat that have been recorded are legally protected or controlled (see Box 1); and,
- Which, if any, sites, areas of habitat and species that have been 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 decision on planning.

Receptors that have been identified as having sufficient value, and that an impact upon them could be of potential significance, have been taken forward for further consideration. Legally protected species were also considered further (refer to Box 1 below). This involved:

- Identifying, for each receptor, any significant effect that is likely to be caused by the Proposed Development, which has the potential to lead to a significant impact and / or to contravene relevant legislation;
- Determining the area within which the likely effects 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 concluding that the receptor could be significantly affected and / or the relevant legislation contravened, the receptor would be subject to further assessment.

6.2.5 Evaluation of the Conservation Importance of the Site

In terms of biodiversity conservation, the Site was evaluated using the ecological evaluation guidance given in the Transport Infrastructure Ireland ('TII'), formally known as National Roads Authority ('NRA'), guidance on the assessment of ecological impacts of National Road Schemes International Importance [35], 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).

6.3 Planning Context

6.3.1 Legislation / Policy Context

Within Ireland, a number of sites of international or national importance to nature conservation, as well as many species of animal and plants are afforded some degree of legal protection, for details see Box 1 below.

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

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

Internationally important sites may also be designated as:

- Special Areas of Conservation ('SAC'): the legal requirements relating to the designation and management of SACs in Ireland are set out in the European Communities (Natural Habitats) Regulations 1997 (as amended) (Habs Regs).
- Special Protection Areas ('SPA'): strictly protected sites classified in accordance with Article 4 of the EC Directive on the Conservation of Wild Birds (79/409/EEC), 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 ('NHA'): 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 ('pNHA'): these sites are afforded the same protection as NHA under the Wildlife (Amendment) Act 2000 from the date that they are formally proposed for designation.

Legally protected species

Many species of animals and plants 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 1999.

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 [62].
- Other Irish Red Data Book species and Nationally / Regionally / Locally Notable species where appropriate [63].

6.3.2 National Planning Context

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 outlined in Box 1.

6.3.2.1 Project Ireland 2040 National Planning Framework

Project Ireland 2040 was launched by the Government in February 2018 [15] and incorporates two policy documents - the National Planning Framework ('NPF') and the National Development Plan ('NDP').

Following a decision of the Government in June 2023, the preparation of a revised NPF [64] commenced to take account of changes that have occurred since it was published (in 2018) and to build on the existing framework. 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. On 8th April

2025, the Government approved the revised NPF following the conclusion of environmental assessments which included a Strategic Environmental Assessment ('SEA'); NIS and Appropriate Assessment Determination and a Strategic Flood Risk Assessment ('SFRA'). Both houses of the Oireachtas, the Seanad and the Dáil, approved this document as of 30th April 2025. The revised NPF is a direct replacement of the NPF and therefore, is detailed further below.

Revised National Planning Framework (April 2025)

Objectives under the 'Strategic Planning for Biodiversity' section of the revised NPF, 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.'*

National Policy Objective 88:

Facilitate the protection and restoration of biodiversity [including in European sites and the habitats and species for which they are selected] through the preparation of national guidance in relation to Planning and Biodiversity to:

- *Plan and manage for integration of biodiversity protection and restoration in future planning and development;*
- *Ensure a consistent and strategic approach to biodiversity protection and restoration across planning authorities and administrative boundaries, and*

- *Support the implementation of the National Biodiversity Action Plan (2023-2030) and the forthcoming National Restoration Plan.*

The National Development Plan (2021-2030)

The National Planning Framework and the National Development Plan will continue to align and form a single vision for Ireland under Project Ireland 2040.

The National Development Plan 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.'*

6.3.2.2 Ireland National Biodiversity Action Plan 2023 - 2030

The National Biodiversity Action Plan ('NBAP') sets out a number of strategic objectives that lay out a clear framework for Irelands approach to biodiversity and demonstrates Ireland's commitment to protect our biodiversity and also halt against decline [65].

'This National Biodiversity Action Plan 2023-2030 builds upon the achievements of the previous Plan. It will continue to implement actions within the framework of five strategic objectives, while addressing new and emerging issues.' The five objectives are as follows:

- **Objective 1**: Adopt a Whole of Government, Whole of Society Approach to Biodiversity;
- **Objective 2**: Meet Urgent Conservation and Restoration Needs;
- **Objective 3**: Secure Nature's Contribution to People;
- **Objective 4**: Enhance the Evidence Base for Action on Biodiversity; and,
- **Objective 5**: Strengthen Ireland's Contribution to International Biodiversity Initiatives.

The following Objective Outcomes were considered relevant to the Proposed Development and this report:

Outcome 2A:

The protection of existing designated areas and protected species is strengthened and conservation and restoration within the existing protected area network are enhanced

Outcome 2B

'Biodiversity and ecosystem services in the wider countryside are conserved and restored.

Outcome 2D

'Biodiversity and ecosystem services in the marine and freshwater environment are conserved and restored.'

Outcome 2H

'Invasive alien species ('IAS') are controlled and managed on an all-island basis to reduce the harmful impact they have on biodiversity and measures are undertaken to tackle the introduction and spread of new IAS to the environment.'

Outcome 3C

'Planning and development will facilitate and secure biodiversity's contributions to people.'

6.3.3 Regional Planning Context

6.3.3.1 Eastern & Midland Regional Spatial and Economic Strategy 2019-2031

The RSES [17] recognises the need to conserve and enhance biodiversity through co-ordinated spatial planning in the eastern and midland region.

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.'

6.3.4 Local Planning Context

6.3.4.1 Wicklow County Development Plan 2022-2028

The CDP [6] contains several 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.'*

6.3.4.2 County Wicklow Heritage Plan 2017-2022

The County Wicklow Heritage Plan ('CWHP') was published in 2017 by WCC [66]. This plan details actions and objectives to conserve the natural, built and cultural heritage of Wicklow and to foster a 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.*

6.3.4.3 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 [67]. At the time of writing this report, an updated plan has not been developed. However, it was intended that the actions in the CWBAP would continue to be implemented beyond its five-year plan timescale as part of ongoing implementation of the CWHP.

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.'*

6.4 Receiving Environment

6.4.1 Desk Study Results

6.4.1.1 European Sites

In accordance with the European Commission Methodological Guidance [68] and policies CPO 17.4, CPO17.5 and CPO17.6 of the CDP [6] 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 [11] states that defining the likely Zone of Influence 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 Proposed Development 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 OPR guidelines [69], 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.

Six European sites were identified within 15km of the Site- these are shown in Figure 6-2 and Table 6-2 below.

Figure 6-2: European Sites within 15km of the Site

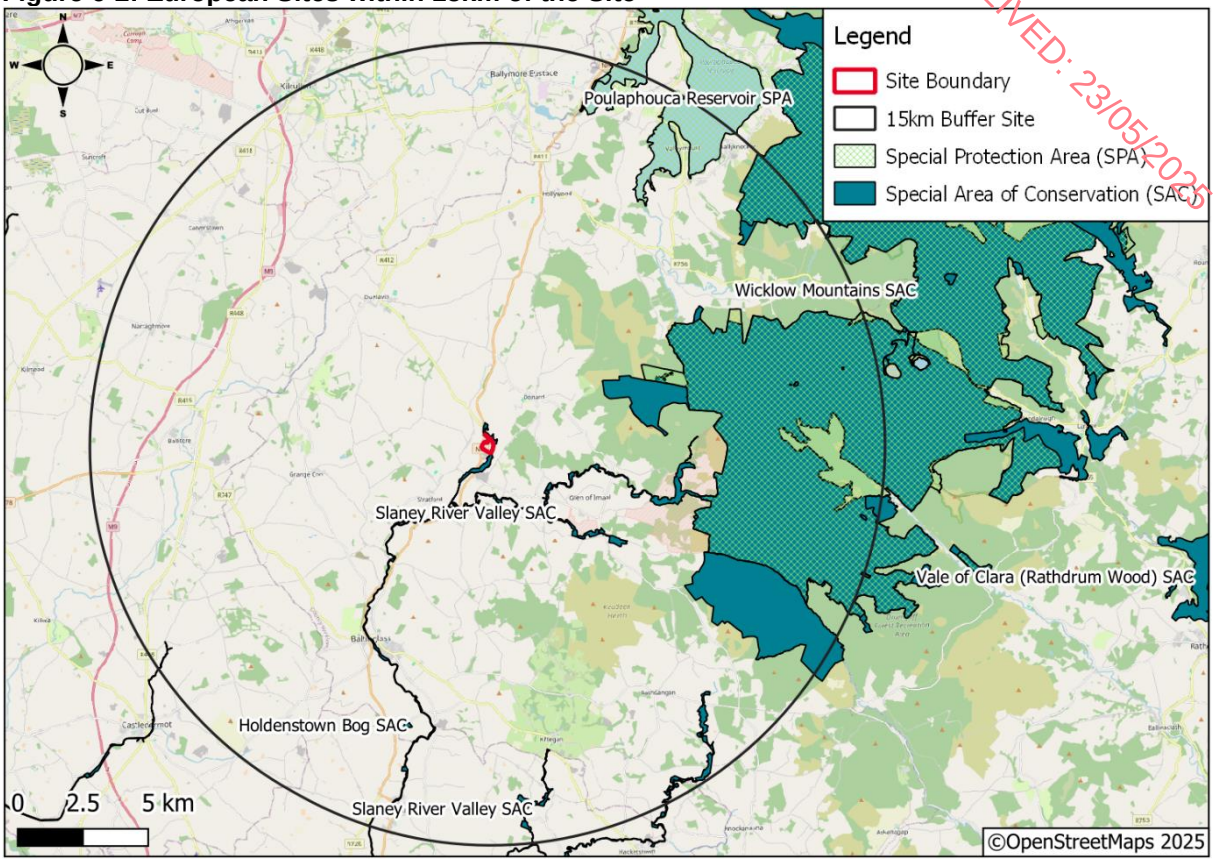


Table 6-2: European Sites within 15km of the Site

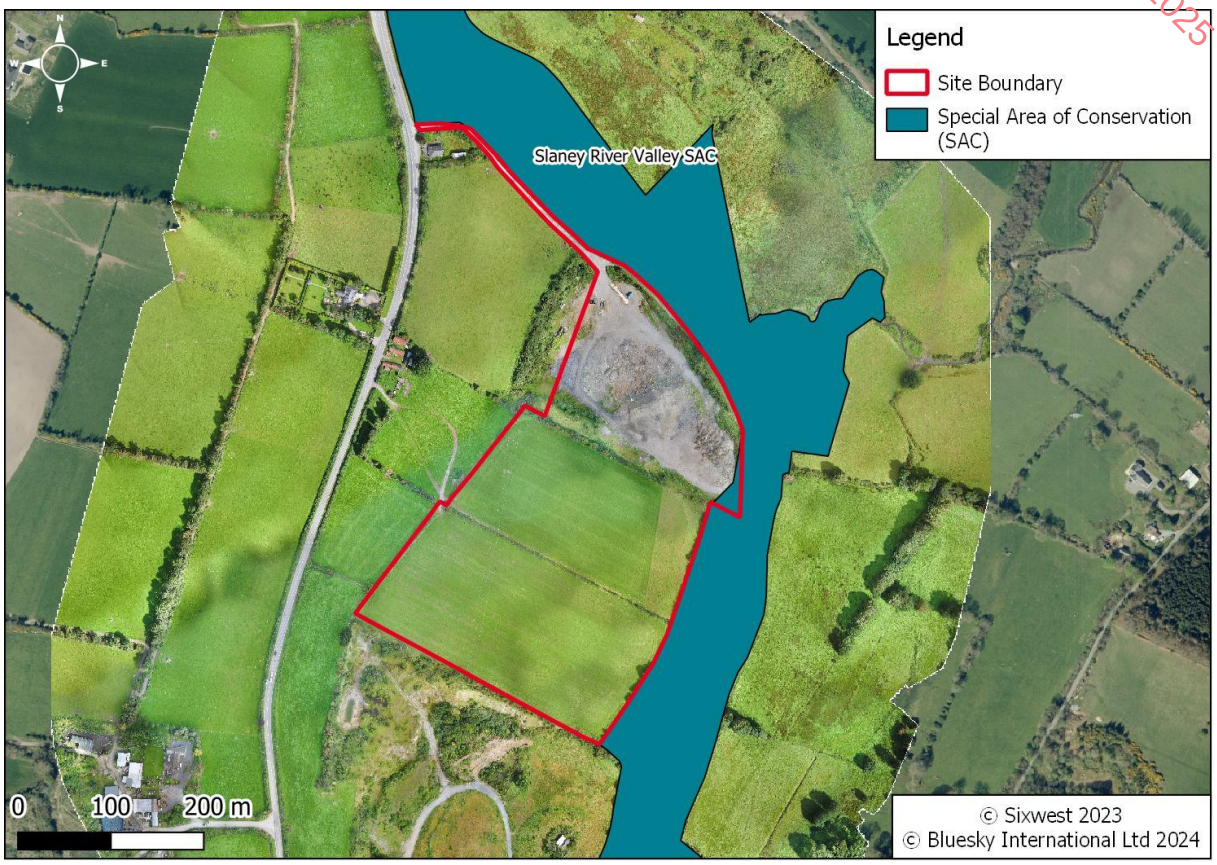
Site Name	Code	Distance (km)	Direction from the Site
Special Areas of Conservation (SAC)			
Slaney River Valley SAC	000781	Partially within	E
Holdenstown Bog SAC	001757	Ca. 11km	SW
Wicklow Mountains SAC	002122	Ca. 5km	E
River Barrow and River Nore SAC	002162	Ca. 14km	SW
Special Protection Area (SPA)			
Wicklow Mountains SPA	004040	Ca. 6.3km	E
Poulaphouca Reservoir SPA	004063	Ca. 10km	N

The Slaney River Valley SAC is partially within the Site, and the boundaries of a further five European sites are located within 15km of the Site.

Given the distance, intervening lands and lack of impact pathways between the Site and Holdenstown Bog SAC, Wicklow Mountains SAC, the River Barrow and River Nore SAC, Wicklow Mountains SPA and Poulaphouca Reservoir SPA, these European sites have been screened out from further consideration.

The majority of the Site boundary is directly adjacent to the Slaney River Valley SAC, however a portion of the Site boundary is partially located within this European site. Further consideration was given to this site in the NIS submitted alongside this report as part of the overall planning application.

Figure 6-3: Slaney River Valley SAC within Site boundary.

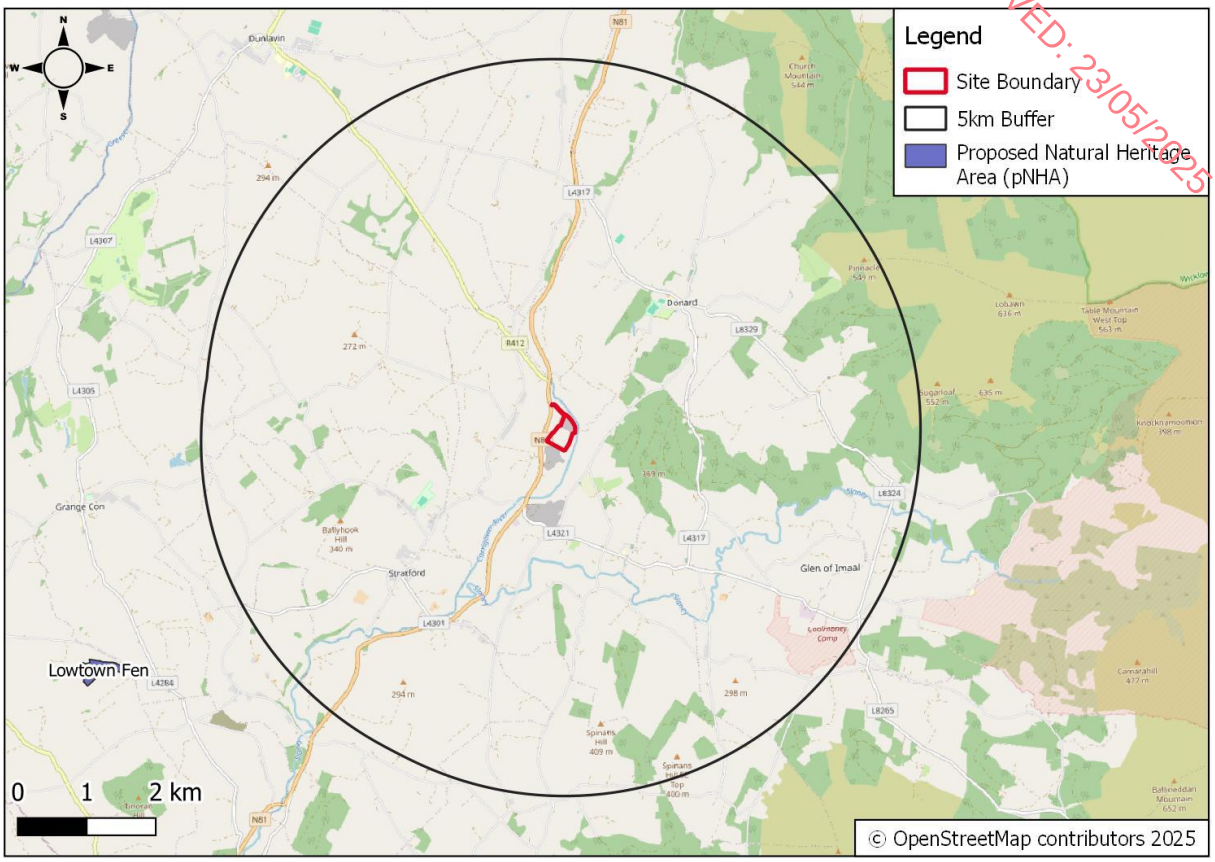


6.4.1.2 Nationally Designated Sites

All Natural Heritage Area ('NHAs') and proposed Natural Heritage Areas ('pNHA') within 5km of the Site have been considered in line with policies CPO17.7 and CPO17.8 of the CDP [6].

No NHAs or pNHAs were identified within 5km of the Site, refer to Figure 6-4.

Figure 6-4: Natural Heritage Areas and proposed Natural Heritage Areas within 5km of the Site



6.4.1.3 Protected / Notable Species

Table 6-3 provides a summary of records of legally protected or otherwise notable species that occur within 2km of the Site at the time of writing this report [56]. The NBDC records were checked on 25th March 2025. The following NBDC 2km girds have been checked: S89X, S89Y, S99C, S99D, S99H and S991 [56].

Only species recorded within the past 10 years were included in Table 6-3. The parameter of 10 years was chosen on the basis of habitat and modification, it is considered that any records over 10 years old are not representative of the current distribution of species populations.

Table 6-3: Protected and or Notable Species within 2km of the Site (S89X, S89Y, S99C, S99D, S99H and S991)

Common Name	*Scientific Name*	Date of last record	Designation
Amphibians			
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

Common Name	*Scientific Name*	Date of last record	Designation
Bird Species			
Barn Owl	*Tyto alba*	01/07/2015	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Red List
Common Kingfisher	*Alcedo atthis*	25/03/2023	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Eurasian Woodcock	*Scolopax rusticola*	13/03/2023	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II Section I and Annex III and Section III Bird Species Birds of Conservation Concern Red List
Terrestrial Mammal			
Eurasian Badger	*Meles meles*	31/12/2016	Wildlife Acts 1976 / 2000
European Otter	*Lutra lutra*	09/10/2015	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II and IV
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
Bat Species			
Brown Long-eared Bat	*Plecotus auritus*	22/08/2013	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*	28/08/2015	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex IV
Leisler's Bat	*Nyctalus leisleri*	01/08/2019	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
Invasive Species*			

Common Name	*Scientific Name*	Date of last record	Designation
American Mink	*Mustela vison*	12/08/2018	Invasive Species: High Impact Invasive Species

*Note: Table includes only invasive species regulated under S.I. 374 (Ireland) [60].

6.4.2 Field Survey Results

The following section provides details of the field-based assessment that was undertaken for the Site on 8th September 2023 and the updated assessments on 17th January 2024 and 28th February 2025. The distribution of the habitats and target notes identifying the location of features of interest are located in Figure 6-5.

6.4.2.1 Habitats

The habitats described below were classified under Fossitt's: A Guide to Habitats in Ireland and are all located within the Site.

Hedgerow / Treeline (WL1 / WL2)

The majority of the agricultural fields in the Site were bounded by extensively managed hedgerows which were predominately comprised of elder (*Sambucus nigra*), blackthorn (*Prunus* spinosa*)*, hawthorn and some gorse. In the area bordering the access path into the quarry and along the western boundary of the agricultural field bordering the quarry, these hedgerows have developed into semi-mature trees >5 meters in height. Recorded amongst the aforementioned species were some solitary trees such as pedunculate oak (*Quercus robur*), sessile oak (*Quercus petraea*), cedar (*Cedrus* spp.) and sitka spruce (*Picea sitchensis*). A typical understorey layer was recorded within these hedgerow/treelines, consisting of nettles, bramble and thistle and broad-leaved dock and false-oat grass.

During the survey completed on the 8th of September 2023, it was noted that the hedgerows were being managed using a tractor-mounted flail. During the 2025 surveys, it was noted that the hedgerows are still heavily managed.

Improved Agricultural Grassland (GA1)

A large portion of the Site was comprised of improved agricultural grassland. Actively grazed by cattle; these four fields form the southern half of the Site and were dominated by perennial ryegrass (*Lolium perenne*) and several other common species such as white clover (*Trifolium repens*), field thistle (*Cirsium discolor*), ragwort (*Senecio jacobea*), broad-leaved dock (*Rumex obtusifolius*) and dandelion (*Taraxacum vulgaria*).

Scrub (WS1)

Prominent areas of scrub were located both within the gravel pit area, along the boundaries of the gravel pit and on the hillsides to the southeast of the agricultural fields in the Site. These scrub areas consist of an array of scattered tree and shrub species such as hawthorn (*Crataegus monogyna*), hornbeam (*Carpinus betulus*), gorse (*Ulex europaeus*), bramble (*Rubus fructicosus*), brome (*Bromus hordeaceus*) and butterfly bush (*Buddleja davidii*), and some birch (*Betula pendula*). A typical assemblage of common species was recorded within the understorey layer these areas of scrub, including nettle (*Urtica dioica*), broad-leaved dock, rosebay willowherb (*Chamaenerion angustifolium*), false oat grass (*Arrhenatherum elatius*) & narrow leaf plantain (*Plantago lanceolata*).

Recolonising Bare Ground (ED3)

Bordering the scrub within the gravel pit were areas that have experienced a high level of disturbance where a number of common ruderal plants were recorded, including nettle,

ragwort, creeping buttercup (*Ranunculus repens*), narrow leaf plantain and false-oat grass and cocksfoot (*Dactylis glomerata*).

Spoil and Bare Ground (ED2)

The gravel pit in the north of the Site was mainly characterised by heaps of spoil and gravel, along with access tracks and other areas of bare ground where the heavy machinery and vehicles needed to work the quarry have prevented the growth of any vegetation.

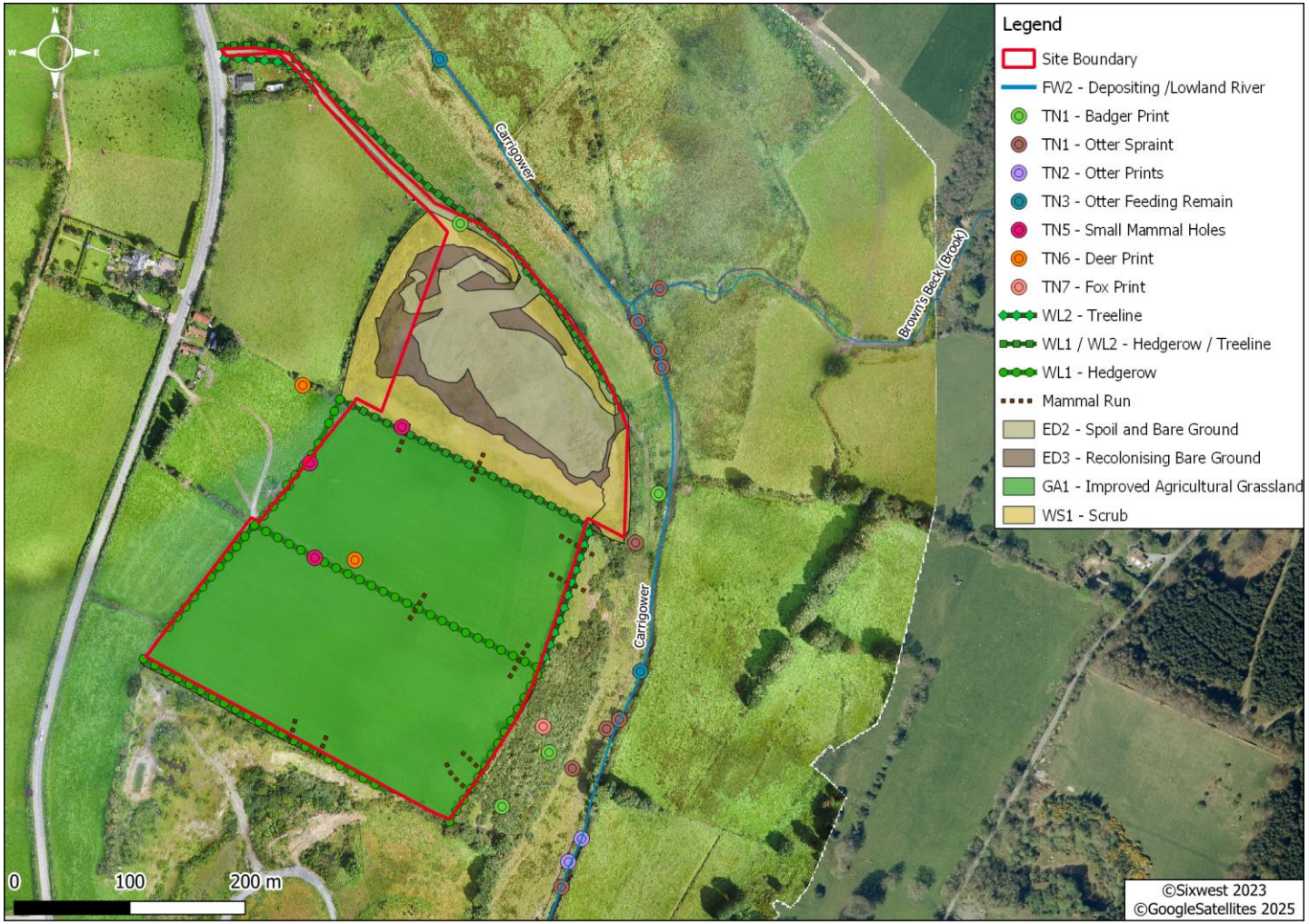
6.4.2.2 Notable off-Site Habitats

Depositing /Lowland River (FW2)

Two notable watercourses are located within the vicinity of the Site, the Carrigower River and the Brown's Beck (Brook) River. The Carrigower River is located ca. 40m to the east of the Site at its closest point and the Brown's Beck (Brook) River is located ca. 50m to the northeast of the Site at its closest point. The Carrigower River is ca. 3m wide and ca. 1m deep and flowed in a southerly direction. The substrate of the River was comprised of gravel and large stones.

Both of these rivers form part of the Slaney River Valley SAC.

Figure 6-5: Habitat Map



6.4.2.3 Species

Flora

The field survey did not identify any plant species protected under the Flora Protection Order onsite.

Amphibians

The NBDC holds records of two amphibian species within 2km of the Site in the past 10 years [56].

The onsite habitats have the potential to support amphibians during the terrestrial phase of their life cycle. However, no suitable groundwater waterbodies or drainage ditches were identified onsite that could support amphibians.

Badger

The NBDC holds records for badger within 2km of the Site in the past 10 years [56].

During the badger survey undertaken on 28th February 2025 a number of badger footprints were identified throughout the area of scrub to the east of the Site (TN1, Figure 6-5). Additionally, one badger footprint was also identified along the access road into the Waste Facility Permit area in the north of the Site (TN1, Figure 6-5).

A single hole badger sett was also identified in the area of scrub ca. 60m to the east of the Site (location confidential). This sett appeared to be disused at the Site of the survey, given that the entrance was covered in cobwebs and the ground around the entrance to the holes appears to have remained undisturbed for some time. It is considered that badger may occasionally use this sett.

No other evidence of badger was identified during the badger survey and it should be noted that no evidence of badger was identified within the proposed extension lands. However, it is considered that badger may occasionally commute through the Site.

Bats

Bats are known to roost within mature trees that have suitable features suitable for roosting bats to emerge and re-enter from. Additionally, bats are known to follow linear features as they commute through the landscape. Two trees with Potential Roost features (PRF) roosting bats were identified onsite, and the hedgerow / treelines that border and traverse the Site were identified as providing suitable foraging and commuting habitats for bats. No bats were observed to be roosting within the trees surveyed onsite. Based on the levels of bat activity recorded during the surveys, it was concluded that the Site is of low-moderate value to bats. Please refer to Appendix 6-2 – Bat Report, for full details of the results of the bat surveys.

It should be noted that during the most up-to-date habitat survey on 28th February 2025 the on-site habitats remain unchanged, and it was considered that the initial assessment of the suitability of the Site for bats and the findings of the bat surveys undertaken in 2023 remained valid.

Birds

The Site was assessed for its potential to provide nesting habitat for breeding birds. Following the initial Site visit, it was deemed necessary to undertake breeding bird surveys.

Over the period of survey efforts, a total of 23 species were recorded either within the Site or flying over the Site during the surveys.

- 18 Green-listed Birds of Conservation Concern in Ireland ('BoCCI') were recorded – blackbird, blue tit, bullfinch, chaffinch, chiffchaff, coal tit, dunnock, goldfinch, great tit,

hooded crow, jackdaw, magpie, pied wagtail, reed bunting, robin, rook, woodpigeon and wren. Of these, two are annex I species: coal tit and chaffinch;

- Four Amber-listed BoCCI, non-annex I species were recorded – barn swallow, goldcrest, house sparrow and spotted flycatcher; and,
- One Red-listed BoCCI, non-annex species was recorded – wheatear.

Over the entire period of survey efforts:

- No species were classified as '*Confirmed Breeding*',
- No active nests nor signs of nest buildings were recorded within the Site; and,
- All 23 species were observed displaying territorial behaviours and were classified as '*Possible Breeding'.*

Please refer to Appendix 6-3 – Bird Report, for full details of the results of the bird surveys.

It should be noted that during the most up-to-date habitat survey on 28th February 2025 the on-site habitats had not changed, and it was considered that the initial assessment of the suitability of the Site for birds and the findings of the bird surveys undertaken in 2023 remained valid.

Otter

The NBDC holds records for otter within 2km of the Site within the past 10 years [56]. The Slaney River Valley SAC, which is designated for otter, is located directly to the east of the Site and the Site boundary is located partially within this European site. Additionally, the otter surveys undertaken at the Site and within the Carrigower River adjacent to the Site in January 2024 and February 2025 identified signs of otter activity, including otter spraints (TN2, Figure 6-5), otter prints (TN3, Figure 6-5) and otter feeding remains (TN4, Figure 6-5). However, no otter holts or couches were identified along the Carrigower River within the study area. The survey shows that otter are using the Carrigower River for foraging and commuting otter. No evidence of otter activity was identified within the Site boundary, and the onsite habitats are not considered optimal for foraging and commuting otter.

Invasive Species

The NBDC holds records of American Mink, a high impact invasive species within 2km of the Site. No evidence of this species was found onsite.

Additionally, no high impact invasive species or plant species listed on the Third Schedule of the 2011 European Communities (Birds and Natural Habitats) Regulations (i.e. species of which it is an offense to disperse, spread or otherwise cause to grow in any space) were identified onsite.

Other Species

According to the NBDC, pine martens and hedgehogs have been recorded within 2km of the Site [46]. Pine martens display a preference for woodland habitats but have also been recorded in scrub and rocky areas. Hedgehogs also display a preference for habitats bordering woodlands, scrub and open grasslands. No evidence of either species was identified onsite or within the scrub to the east of the Site during the surveys in January 2024 or February 2025. However, there is potential for both species to commute through the Site and utilise the scrub and woodland habitats to the east of the Site.

Multiple small mammal holes (TN5, Figure 6-5), rabbit sightings and rabbit droppings were identified throughout the Site. Additionally, deer prints (TN6, Figure 6-5) and fox prints (TN7, Figure 6-5). It is considered that the grassland and hedgerow / treelines provide suitable

foraging / commuting habitats for species including rabbits and deer within the vicinity of the Site.

6.5 Characteristics and Potential Effects of the Proposed Development

6.5.1 Sensitive Design

To minimise the potential adverse effects of the Proposed Development on biodiversity and, where possible, enhance the ecological value of the Site, a range of environmental measures have been incorporated into the project. The measures relevant to this project have been detailed below.

- MOR Environmental has prepared a Restoration Plan for the Site and will be implemented throughout the various phases of the Proposed Development and following completion of the operational stage to restore the Site. The Restoration Plan includes the reinstatement of the agricultural grassland and historical field boundaries / hedgerows, as well as a number of ecological enhancement measures. These measures are in-line with Objective 4 of the NBAP [54] and Objective NH13 of the CDP [61];
- All boundary hedgerow / treelines to be retained. A 5m buffer will be maintained between the retained hedgerow/treelines and the pit face. Only minor ancillary works can occur within this buffer zone;
- All vegetation management will be planned in accordance with relevant legislation and undertaken outside of the period between the 1st March to 31st August to avoid potential disturbance of nesting birds;
- 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 effects to nocturnal species in the area will be limited; and,
- Dust control measures will be implemented as part ongoing works, as detailed in Chapter 9 (Air Quality).

6.5.2 Identification of Potentially Significant Effects on Identified Receptors

Based on the methodology that is set out in Section 6.2, Table 6-4 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 Restoration Stages combined.

Table 6-4: 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)	Internationally designated sites for conservation.	A 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 [6] and policy objectives RPO7.16 and RPO10.6 of the Eastern & Midland RSES [70]. The NIS concluded that the Proposed Development would not cause any significant adverse effect on any European sites or any of their designated features of interest, subject to the mitigation measures presented in the report. Progression to Stage 3 of the Appropriate Assessment process (i.e., Assessment of Alternative Solutions) was not considered necessary. For full details on the assessment of impacts to European sites, refer to the NIS submitted as part of planning.	European sites have been scoped in for further consideration. Refer to NIS submitted as part of planning for full details.
Nationally Designated Sites	Wildlife Act 2000 (as amended).	Nationally designated sites for conservation.	Nationally designated sites were considered as part of this assessment in line with policies CPO17.4, CPO17.7 and CPO17.8 of the CDP. There are no NHAs or pNHAs within 5km of the Site. Therefore, there is no potential for the Proposed Development to cause any effects on these sites. This receptor has, therefore, been scoped out from further consideration.	Nationally designated sites have been scoped out from further consideration.
Habitats				
Spoil and Bare Ground (ED2)	N/A	Low Local Value	Spoil and Bare ground is located on the north of the Site within the Waste Facility Permit Area, which was undergoing restoration at the time of the survey. This area is being restored under Planning Reference 20/1117. The area is largely devoid of vegetation and no notable species were found within this area. The Proposed Development will not alter this habitat, and this receptor has been scoped out from further consideration.	Spoil and bare ground have been scoped out from further consideration.
Recolonising Bare Ground (ED3)	N/A	Low Local Value	Recolonising Bare Ground is present in the Waste Facility Permit Area, which was undergoing restoration at the time of the survey. This area is being restored under Planning Reference 20/1117. No notable species were identified within this area. The Proposed Development will not alter this habitat and this receptor has been scoped out from further consideration.	Recolonising Bare Ground has been scoped out from further consideration

Potential Biodiversity Receptor	Relevant Legislation / Policies	Valuation of the Site	Scoping Result and Justification	Scoping Result
Scrub (WS1)	Wildlife Act 2000 (as amended)	High Local Value	Scrub is present along the edges of the Waste Facility Permit area that is undergoing restoration under Planning Reference (20/1117). This habitat has the potential to support protected / notable species. As part of the Proposed Development, there will be no removal of any scrub, so this habitat has been screened out from further consideration.	Scrub has been scoped out from further consideration.
Hedgerows/Treelines (WL1/WL2)	Wildlife Act 2000 (as amended)	High Local Value	The majority of boundary hedgerow / treelines will be retained as part of the Proposed Development. The linear features bordering the south, east and west will be enhanced with native tree and shrub planting at the commencement of operations, which will provide additional habitat for birds and foraging and commuting bats in the area. One hedgerow totalling ca. 274m will be removed to facilitate extraction in the proposed extension lands, and one hedgerow along the northern boundary will be partially removed to facilitate access between the proposed extension lands and the Facility Permit. In total, 346m of hedgerow will be removed. All vegetation removal will need to take account of protected species, such as nesting birds. All clearance works will be scheduled to take place outside the nesting bird season (typically considered to be between 1st March to 31st August – weather dependent). It should be noted that the Restoration Plan for the Site involves managing the area of scrub to the east of the Site boundary to facilitate tree planting. It is considered that once the trees are planted and this area becomes a more established woodland habitat, this will compensate for the permanent loss of the hedgerow along the northern boundary of the Site and the temporary loss of the central hedgerow. It should also be noted that the hedgerow that will be removed was heavily managed at the time of the Site visits and was concluded to be of low ecological value. This hedgerow will be replanted with a native species mix as part of restoration. Additionally, the existing boundary features to the south, east and west of the Site will be enhanced with native tree and shrub species, following the guidance of Hedgerows Ireland [71]. It is considered that once the boundary features are enhanced with additional planting and the removed central hedgerow is replanted with an enhanced native hedgerow / treeline mix as outlinedf in the Restoration Plan, the hedgerow / treelines will be more improved than their current state. However, as mitigation measures are required to compensate for the removal of hedgerows, this habitat has been screened in for further consideration.	Hedgerows/Treelines have been scoped in for further consideration.

Potential Biodiversity Receptor	Relevant Legislation / Policies	Valuation of the Site	Scoping Result and Justification	Scoping Result
Improved Agricultural Grassland (GA1)	N/A	Low Local Value	This was the most abundant habitat onsite, and is very commonly found throughout Ireland. The species found in this habitat were common and not of conservation concern. Furthermore, the grassland is heavily grazed by sheep which has lowered the value of this area for biodiversity. Therefore, improved agricultural grassland has been scoped out from further consideration.	Improved Agricultural Grassland has been scoped out from further consideration.
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 onsite. Overall, the effect of the Proposed Development on notable / protected flora is considered unlikely to be significant. Therefore, the effect of the Proposed Development on notable / protected flora is not significant and 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	Low Local Value	No waterbodies suitable for frogs or newts were identified onsite. However, it should be noted that the Restoration Plan includes the creation of multiple habitats that will potentially be used by amphibians including a pond to the east of the Site, creation of hibernacula habitats and the retention and enhancement of the settlement pond within the quarry. These measures will create suitable breeding habitat for amphibians. As the Proposed Development will not cause any effects on amphibians, this species has been scoped out from further consideration.	Amphibians have been scoped out from further consideration.

Potential Biodiversity Receptor	Relevant Legislation / Policies	Valuation of the Site	Scoping Result and Justification	Scoping Result
Badgers	Wildlife Acts 1976 / 2000	Site: Low Local Value Adjacent habitats: High Local Value	The targeted badger survey undertaken on 28th February 2025 and identified multiple badger footprints throughout the area of scrub to the east of the Site (TN1, Figure 6-5). Additionally, one disused badger sett was identified in the area of scrub to the east of the Site (location confidential). No badger setts were identified with the site boundary. The habitats within the Site boundary provide suitable foraging habitat for badgers and the sections of hedgerow / treelines do provide suitable habitat for badger sett construction. The scrub area bordering the Water Facility Permit Area is subject to disturbance as a result of the ongoing restoration works and is considered to be suboptimal for sett construction. It is considered that badger may occasionally commute through the Site, but the on-site habitats are suboptimal for this species. The most important habitats for badger are considered to be the scrub bordering the east of the Site. A minimum buffer of 5m will be maintained between the extraction area and this area of scrub to the east of the Site. Additionally, the connectivity that this scrub habitat provides to other foraging and commuting habitats for badger will not be affected by the Proposed Development. The Restoration Plan for the Site also includes for the enhancement of this area of scrub, through scrub management and tree planting. This will enhance this area for badger. However, given the presence of a badger sett within close proximity to the Site, this species has been scoped in for further consideration.	Badgers have been scoped in for further consideration
Bats	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex IV	High Local Value	Two trees onsite were identified as providing suitable potential roosting features for bats and surveyed for bat emergence. The hedgerow / treelines onsite that were considered to be suitable for foraging and commuting bats were also surveyed. No bats were roosting within the trees surveyed, and there were between low – moderate levels of bat activity onsite. Lighting will be installed on-site around the wheelwash, office, generator shed and wash plant at the Site entrance. There is potential for bats to be affected by this lighting in the absence of mitigation measures. The Proposed Development will result in a loss of foraging habitat for bats as one central hedgerow will be removed, a northern hedgerow will be partially removed to facilitate access between the Facility Permit and the proposed extension lands and there will be a land use change from agricultural grassland to an active quarry. However, as part of the Restoration Plan for the Site, the Site will be restored to agricultural grassland and the removed central hedgerow will be reinstated. The boundary hedgerow / treelines will also be enhanced with native tree and shrub planting. The Restoration Plan for the Site also	Bats have been scoped in for further consideration

Potential Biodiversity Receptor	Relevant Legislation / Policies	Valuation of the Site	Scoping Result and Justification	Scoping Result
			includes for the creation of habitats that will be suitable for foraging and commuting bats, including tree planting and ponds. However, as the Proposed Development will require the removal of habitats that were used by foraging and commuting bats and the installation of lighting, this species has been scoped in for further consideration.	
Birds	Wildlife Acts 1976 / 2000	Low Local Value	The works will require the removal of one hedgerow onsite and part of the northern hedgerow. It should be noted that this central hedgerow was heavily managed and sparse at the time of the surveys, and no nests were identified within this hedgerow or any other hedgerow / treeline bordering the Site. However, 23 bird species were concluded to be 'possibly breeding' onsite. It is considered that the habitats within the vicinity of the Site are more important for birds than the onsite habitats. Additionally, all clearance works will be scheduled to take place outside the nesting bird season (typically considered to be between 1st March to 31st August – weather dependent). Additionally, the Restoration Plan for the Site includes for the creation of habitats that will be suitable for breeding and commuting birds including tree planting and enhancement planting of existing boundary hedgerow / treelines. However, as mitigation measures will be required to ensure that birds do not face adverse effects from the Proposed Development, they will need to be screened in for further consideration.	Birds have been scoped in for further consideration
Otter	Wildlife Act 2000 (as amended) EU Habitats Directive Annex IV	Site: Low Local Value Adjacent habitats: High Local Value	The NBDC holds records for otter within 2km of the Site. Additionally, the otter surveys undertaken in January 2024 and February 2025 identified evidence of otter within the Carrigower River to the east of the Site in the form of otter spraints, otter prints and feeding remains. It was concluded that otter are likely to commute and forage along the Carrigower River. However, no otter holts were identified along the Carrigower River. No evidence of otter was identified on-site and the on-site habitats are considered to be unsuitable for otter. Additionally, the Restoration Plan includes for the installation of an artificial otter holt and the creation of a pond along the Carrigower River. The artificial otter holt will provide suitable breeding habitat for otter and the pond will attract amphibians, providing suitable foraging prey for otter. However, as otter are using the Carrigower River for foraging and commuting purposes, mitigation measures will be implemented for the protection of water quality to ensure that no effects occur to otter or any other aquatic species during the construction works. Furthermore, mitigation measures will be implemented in order to ensure no effects occur	Otter have been scoped in for further consideration

Potential Biodiversity Receptor	Relevant Legislation / Policies	Valuation of the Site	Scoping Result and Justification	Scoping Result
			to otters from elevated noise levels during the construction, operational and restoration stages. Otter have therefore been screened in for further consideration.	
Invasive Species	Species dependent	N/A	The NBDC holds records of one invasive species within 2km of the Site – American Mink. This is an invasive species regulated under S.I. 374 (Ireland). No evidence of this species was identified on-site and it is considered that the on-site habitats are suboptimal for American Mink. However, the Carrigower River adjacent to the Site may provide suitable habitat for this species. No evidence of American Mink was identified during the in-river otter surveys undertaken in January 2024 and February 2025. No high impact invasive species listed on the Third Schedule of the 2011 European Communities (Birds and Natural Habitats) Regulations (i.e. species of which it is an offense to disperse, spread or otherwise cause to grow in any place) were noted onsite during the field surveys. Standard measures will be implemented in order to ensure no invasive species are introduced into the Site during both the construction and operational stages (see Section 6.6.6 below). Additionally, the restoration for the Site will involve the importation of by-product soils from other developments to achieve the required landform and functional profile. Due to the risk associated with the spread of invasive species as a result of importing large amounts of soil, mitigation measures will be required. This is in compliance with objective CPO 17.17 of the CDP [6].	Invasive species have been scoped in for further consideration.
Other Species	Common species N/A	Low Local Value	Given the presence of suitable habitats onsite and within the wider area for rabbits, deer and other terrestrial mammals, standard protection measures for these species will be incorporated into the works in line with CPO17.12 of the CDP [6] refer to Section 6.6.7 below.	Other species have been scoped in for further consideration.

6.5.3 Summary of Potential Effects

Following a detailed assessment, the following species and habitats were identified as significant receptors and were brought forward for further consideration in Section 6.6 below

- European sites;
- Hedgerows / Treelines (WL1/WL2);
- Badgers / Terrestrial Mammals;
- Bats;
- Birds;
- Otter;
- 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.

6.6 Proposed Mitigation Measures and / or Factors

The following mitigation measures will be incorporated and adhered to during the construction, operational and restoration stages 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 effects. The mitigation measures detailed within this EIAR will be fully adhered to;
- The Site manager shall ensure that all personnel working onsite are trained and aware of the mitigation measures detailed within the EIAR;
- If protected or notable species are encountered during operations at the Site, works will stop within the area that these animals are identified and the project Ecological Clerk of Works ('ECoW') will be contacted for advice;
- Protected and notable species posters will be erected on the Site notice board and maintained throughout the duration of the works; and,
- In advance of works, all site personnel will receive a toolbox talk regarding notable and protected species. Everybody working onsite must understand the role and authority of the ECoW.

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 the works are completed in line with the measures in this EIAR and wildlife legislation.

6.6.1 Protection and Enhancement of Retained Hedgerow/Treelines

To ensure that no impacts or unnecessary damage occurs to the hedgerows and treelines that border the Site (as per policies CPO17.14 and CPO17.23 of the CDP [6]) care will be required to protect the retained linear features on-site from both direct and indirect disturbance during the construction and operational stages of the Proposed Development.

The following protection measures will be adhered to during the works:

- No materials, equipment or machinery will be stored within close proximity to retained hedgerows / treelines;
- 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; and,
- Notice boards, wires, etc. will not be attached to any trees.

Additionally, guidance from Hedgerows Ireland [71] will be followed during the enhancement planting that will occur along the hedgerows bordering the south, east and west of the Site to protect these retained linear features, including the following:

- Plant native, pollinator-friendly trees of Irish provenance;
- Plant whips every 30cm in two staggered rows with a 40cm gap; and,
- Maintain a 1-2 metre hedge margin for wildlife.

6.6.2 Protection of Badgers and Terrestrial Mammals

One badger footprint was identified within the Site but the majority of badger activity was identified in the area of scrub to the east of the Site outside of the Site boundary. Given the presence of a badger sett adjacent to the Site boundary the following mitigation measures should be adhered to, which are in line with the NRA (now TII) guidance for badgers:

- Prior to the commencement of operations on-site an updated badger survey should be undertaken by the ECoW. This survey should focus on lands within the Site and the area of scrub to the east of the Site;
- Annual badger surveys will be undertaken to confirm the absence of badger from the areas to be affected by the works; and,
- If any badger setts are identified within 50m of the Site, the NPWS will be consulted with regards to the need for a derogation licence.

Additionally, the following mitigation measures will protect badger and other terrestrial mammals including pine marten and hedgehog from disturbance:

- Should the proposed works be required outside of daylight hours, the ECoW will be consulted as required;
- Obvious mammal paths will be left clear of obstruction to allow for the free movement of smaller mammals throughout the landscape;
- If unidentified burrows are identified within the works area during works, the ECoW will be contacted for advice;
- The clearance of any vegetation on-site, including the central hedgerow, will be supervised by the ECoW;
- Activities and deliveries to the Site will occur only during permitted hours;
- All plant where possible shall be low noise rated;
- Onsite policy for all plant and equipment, including Site delivery vehicles, to power off rather than to be left with idling engines;
- All plant and vehicles on the Site will be in a fit condition for use, to prevent the addition of noise from maintenance issues;
- Management of deliveries and vehicles to minimise vehicles idling on-site;
- Careful selection of quiet plant and machinery to undertake the required work, where available; and,
- Handling of all materials will take place in a manner which minimises noise emissions.

Additionally, it should be noted that the Restoration Plan for the Site involves enhancing the existing boundary hedgerow / treelines and scrub management and tree planting within the Land Ownership boundary. It is anticipated that the creation of these habitats will benefit badgers within the area and compensate for the removal of the grassland and hedgerow to facilitate the Proposed Development.

6.6.3 Protection for Bats

As habitats suitable for foraging and commuting bats will be removed, the following measures will be put in place for bats within the vicinity of the Site:

- Lighting will be installed on-site around the wheel wash, office, generator shed and wash plant at the Site entrance. This lighting will be directional and will be turned off at night. This will ensure that bats foraging / commuting around the boundary habitats are not impacted by lighting on-site;
- An updated bat survey will be undertaken within the active bat survey season prior to the commencement of construction and vegetation clearance works to confirm the absence of roosting bats;

- Two trees on-site have features suitable for roosting bats and one will be removed to facilitate the Proposed Development. Immediately prior to the removal of this tree, the ECoW will undertake an assessment of the tree to assess it for evidence of potential roosting bats including droppings, urine splashes and fur-oil staining;
- The removal of the tree that has features suitable for roosting bats will be supervised by the ECoW; and,
- Where possible, the PRF tree which will to be removed, should be felled on mild days during the autumn months of October – November or during spring months of February-March (felling during the spring or autumn avoids the periods when bats are most active and without young).

Additionally, it should be noted that the Restoration Plan for the Site involves enhancing the existing boundary hedgerow / treelines and the creation of new habitats within the Land Ownership boundary. New habitats created as part of the Restoration Plan that will benefit foraging and commuting bats include the creation of a pond and scrub management and tree planting. It is anticipated that the creation of these habitats will benefit bats within the area and compensate for the removal of the grassland and hedgerow to facilitate the Proposed Development.

Please refer to Appendix 6-2 - Bat Report for full details of the mitigation measures for bats.

6.6.4 Protection for Birds

To ensure no effects occur to breeding birds as a result of the Proposed Development, the following mitigation measures will be put in place:

- Any vegetation clearance required will take place outside of the nesting bird season (1st March to 31st August), as per Section 40 of the Wildlife Act 1976, as amended by Section 46 of the Wildlife (Amendment) Act 2000;
- In the event that works need to be undertaken within the main breeding season, this would be undertaken in consultation with NPWS;
- Should birds nest within the active working area during site operations, works within the area will stop within the area and the ECoW will be consulted; and,
- If notable / protected bird species are identified colonising any areas to be affected by the works, 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.

Additionally, it should be noted that the Restoration Plan for the Site involves enhancing the existing boundary hedgerow / treelines and the creation of new habitats within the Land Ownership boundary. New habitats created as part of the Restoration Plan that will benefit bird within the area include the creation of a pond and scrub management and tree planting. It is anticipated that the creation of these habitats will benefit birds within the area and compensate for the removal of the grassland and hedgerow to facilitate the Proposed Development.

Please refer to Appendix 6-3 - Bird Report for full details of the mitigation measures for birds.

6.6.5 Protection for Otter

Evidence of otter was identified during the otter survey along the Carrigower River, but no evidence of otter was identified within the Site boundary. In addition to general mitigation measures to ensure the protection of water quality within the vicinity of the Site during the construction, operational and restoration stages of the Proposed Development, the following measures will be implemented to ensure there is no disturbance to otters:

- Activities and deliveries to the Site will occur only during permitted hours;
- All plant where possible shall be low noise rated;
- Onsite policy for all plant and equipment, including Site delivery vehicles, to power off rather than to be left with idling engines;
- All plant and vehicles on the Site will be in a fit condition for use, to prevent the addition of noise from maintenance issues;
- Management of deliveries and vehicles to minimise vehicles idling on-site;
- Careful selection of quiet plant and machinery to undertake the required work, where available; and,
- Handling of all materials will take place in a manner which minimises noise emissions.

As mentioned above, mitigation measures will be implemented to protect water quality within the Carrigower River. Please refer to Chapter 8: Water for further details.

Additionally, it should be noted that the Restoration Plan for the Site involves the creation of habitats that will benefit otter within the Land Ownership boundary, including an artificial otter holt, the creation of hibernacula habitats and the creation of a pond adjacent to the Carrigower River. The otter holt will provide potential breeding and sheltering habitat for otter, and the pond will attract amphibians which provides foraging opportunity for otter. It is considered that the measures included in the Restoration Plan for will compensate for disturbance arising to otter as a result of the Proposed Development. Additionally, as these habitats will be created at the commencement of Site operations, there will be an immediate benefit to otter within the area.

6.6.6 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 [6] and the NRA guidelines for the management of noxious weeds and non-native invasive plant species [53]:

- Acceptance criteria for the incoming materials would need to be adhered to as per the National By-Product Criteria Ref No. BP-N002.2024;
- Sourcing material that is determined to be by-product prior to transport to the Site;
- Pre-agreed source sites for inert material ensuring no invasive species are present;
- The operator will have a documented waste recording procedure for all by-product material entering the Site;
- No unauthorised dumping of waste will be allowed at the Site;
- All vehicles, machinery and any other equipment used for the works will be washed prior to its use at the Site to prevent the import of plant material or seeds;
- Before machinery or equipment is unloaded at the Site, equipment will be visually inspected to ensure that all adherent material and debris have been removed;
- The staff on-site will be made aware of the dangers associated with cross-contamination of invasive plant species with soil;
- Any vehicles and machinery that are not clean will not be permitted entry to the Site;
- Clean, uncontaminated soil and stone by-products accepted to the Site will be free of invasive species (suitable evidence provided from the source site prior to agreeing to

take the materials, which may include 'statement of conformity from the producer or a report from a suitably qualified ecologist or similar). The applicant will engage a suitably qualified and experienced practitioner to assess the evidence if necessary; and,

- If high impact invasive species are identified on-site, including Japanese knotweed or Himalayan balsam, the ECoW will be contacted for advice.

6.6.7 Protection for Other Species

As mentioned in Table 6-4 above, the on-site habitats have the potential to support foraging and commuting rabbits, deer and other terrestrial mammals including pine marten and hedgehog. The following measures will be implemented to ensure no effects to other species:

- Should the proposed works be required outside of daylight hours, the ECoW will be consulted, as required; and,
- If unidentified burrows are identified within the works area during construction, works will cease within the area and the ECoW will be consulted for advice.

6.6.8 Restoration Stage

Following cessation of the quarry activities at the Site, a Restoration Plan for the Site will be implemented. Details of the quarry Restoration Plan are attached in Appendix 6-1. The Restoration Plan has been developed taking into account the ongoing restoration in the WFP area, the species identified during the Site surveys and the species that will likely utilise the area following completion of the works.

The Restoration Plan will involve restoring the Site to agricultural grassland and re-planting the central hedgerow that will be removed. It should be noted that the removed hedgerow was heavily managed at the time of field surveys and this hedgerow will be re-planted with native species that will benefit local fauna including nesting birds and foraging and commuting bats. Additionally, the settlement pond created during operations will be retained and enhanced to create a biodiverse waterbody on-site. It is considered once restoration plan is fully implemented, when the re-planted hedgerow / treeline becomes established and the settlement pond is enhanced to become a waterbody feature on-site that the Site will be more biodiverse than it was at the time of the field surveys.

At the commencement of Site operations, the hedgerows bordering the south, east and west of the Site will be enhanced with native tree and shrub species for screening purposes. This will also benefit wildlife within the area. Additionally, a key element of the Restoration Plan includes habitat creation and enhancement within the Land Ownership boundary. It is considered that when implemented, the Restoration Plan will provide more beneficial habitats for otter, badger, bats and birds than currently exist within the Land Ownership boundary. The Restoration Plan will compensate for the vegetation removal and change in land use associated with the Proposed Development.

The Site will be subject to an updated ecological assessment in advance of the implementation of the Restoration Plan to ensure that the recommendations remain relevant and to ensure that the works required to implement the plan will not result in any effects on biodiversity or breaches of relevant wildlife legislation.

6.6.9 Unplanned Events

Should any protected or notable species colonise the Site during the life cycle of the project, there is a potential for these species to be impacted by the operations onsite. 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 Proposed

Development will ensure that any protected or notable species will be identified and that appropriate mitigation / preventative actions can be taken.

6.7 Cumulative and In-combination Effects

As described above, the Proposed Development works are unlikely to have any significant effects on valued ecological receptors onsite or in the surrounding area.

Furthermore, any potential cumulative effects 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 effects 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 effects will arise as a result of the Proposed Development. Subsequently, the cumulative effects on ecology arising from the Proposed Development in-combination with other developments is considered to be imperceptible.

6.8 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.
- Chapter 8 – The Carrigower river, which forms part of the Slaney River Valley SAC, is located ca. 40m to the east of the Site. This waterbody and SAC are known to support otters. Water quality deterioration has the potential to affect aquatic and riparian species but appropriate mitigation measures are presented in Chapter 8 to combat this issue.
- Chapter 9 – Air Quality: Dust related effects can have an effect on water quality and therefore aquatic biodiversity. Dust can also 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
- Chapter 11 – Acoustics (Noise & Vibration): species within the locality have become habituated to noise arising from quarry activities, from the former sand and gravel pit sources within the wider area.

6.9 Residual Effects

Based on the methodology set out in Section 6.2, the initial assessment of ecological receptors (Table 6-4) screened out the following attributes, habitats and species:

- Nationally designated sites (NHAs and pNHAs);
- Spoil and Bare Ground;
- Recolonising Bare Ground;
- Scrub;
- Improved agricultural grassland;
- Flora; and,

- Amphibians.

These ecological receptors were screened out from further assessment as the potential effects 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 effects:

- Euroepan designated sites;
- Hedgerows / Treelines;
- Badgers / Terrestrial Mammals;
- Bats;
- Birds;
- Otter;
- 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 6.6.7. The results of these measures on these ecological receptors and the resulting residual effects are described below in Table 6-5.

Table 6-5: Residual Effects on Screened in Receptors

Receptor	Potential Effects	Assessment of Effects Post Mitigation and Enhancement	Residual Effects
Hedgerow (WL1) / Treeline (WL2)	Vegetation removal – loss of habitat	Following the implementation of the proposed tree protection measures, outlined in Section 6.5.1, all retained hedgerow / treelines will be protected from disturbance / damage. The Proposed Development will require a small managed hedgerow to be removed. This will have a negative medium-long term effect. The Proposed Development will also require the permanent loss of a small length of hedgerow to facilitate an access ramp. However, the successful implementation of the Restoration Plan includes for the re-planting of this hedgerow with more biodiverse and native species, enhancement planting of the boundary hedgerows and additional tree planting. Once established, these habitats will result in a slight positive effect on ecology in the long-term.	Not significant
Badgers / Terrestrial Mammals / Other Species	Disturbance, loss of foraging / commuting habitat	Following the implementation of the mitigation measures outlined in Section 6.6.2 including pre-construction surveys for badger, and creation of habitats included in the Restoration Plan it is considered that potential effects on badger and other terrestrial mammals will not be significant and as such there will be no residual effects.	Not significant
Other species			
Bats	Loss of foraging / commuting habitats	Following the implementation of mitigation measures outlined in Section 6.6.3, it is considered that potential effects on bats will not be significant. Additionally, the successful implementation of the Restoration plan will provide habitats which can be used by foraging and commuting bats.	Not significant
Birds	Disturbance of breeding birds	Following the implementation of the mitigation measures outlined in Section 6.6.4 it is considered that potential effects on breeding birds will not be significant. Additionally, the creation of habitats included in the Restoration Plan will benefit birds within the local area.	Not significant
Otter	Disturbance	Following the implementation of the mitigation measures outlined in Section 6.6.5, it is considered that potential effects on otter will not be significant. Additionally, the creation of habitats included in the Restoration Plan will benefit otter.	Not significant
Invasive Species	Introduction and spread of invasive species.	Provided the mitigation outlined in Section 6.6.6 is followed, it is considered that no effects will occur to valued ecological receptors as a result of the spread or introduction of invasive species.	Imperceptible

Taking into account the mitigation measures and the proposed enhancement measures for the Site, it is considered that following the completion of onsite operations, the residual effects on ecology will be imperceptible.

In the longer-term, following the successful implementation of the Restoration Plan, it is considered that the proposed project has the potential to have a slight positive effect on ecology.

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:

- The ECoW will inspect the Site in advance of ground stripping works commencing and will undertake Site inspections as required during the works, to ensure that all of the works are completed in line with the EIAR,
- As part of the Site inspection, the ECoW will undertake a terrestrial mammal survey to confirm the absence of species such as badgers from the Site and the surrounding area; and,
- Dust and Water quality monitoring will be required to ensure that the 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 operations on-site. The Site will be restored to land suitable for agricultural use. Details of the Restoration Plan commitments are included in Appendix 6-1.

Following the implementation of the Restoration Plan, no additional reinstatement requirements will be required.

6.12 Difficulties Encountered

No difficulties were encountered in undertaking this assessment.

It should be noted that a Sites biodiversity value and use by protected or notable species can alter over time. For this reason, updated surveys have been included as part of the mitigation works to ensure that Site conditions remain unchanged and ensure that the Proposed Development will not have any significant effects on Biodiversity.

7 LAND, SOIL AND GEOLOGY

7.1 Introduction

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

7.2 Methodology

The following chapter of this 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 [12].

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 [72];
- National Roads Authority ('NRA') Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes [73];
- Department of Environment, Heritage and Local Government Quarries and Ancillary Activities - Guidance for Authorities [74];
- EPA Environmental Management in the Extractive Industry (Non-Scheduled Minerals) [75];
- Institute of Environmental Management & Assessment ('IEMA') Guide: A New Perspective on Land and Soil in Environmental Impact Assessment [76]; and,
- Department for Environment, Food and Rural Affairs ('DEFRA'): Construction Code of Practice for the Sustainable Use of Soils on Construction Sites [77].

7.2.2 Desk-based Study

A desk-based study of the Site was conducted using available geological information held by the Geological Survey of Ireland ('GSI') for the general area and any available site-specific information, including the findings from topographical surveys and site visits conducted in July, October and November of 2023, January and November 2024, and February of 2025. The following sources were reviewed for this purpose:

- GSI Public Data Viewer [27];
- EPA Online Mapping [78]; and,

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 Current Land Use and Site Description

The northern section of the Site, is a permitted waste facility (WFP-WW-21-0067-01) valid from 24th August 2021 to 24th August 2026. The Waste Facility Permit was granted for the waste activities in accordance with the Third Schedule, Part I of the Waste Management (Facility Permit and Registrations) Regulations 2007, as amended by the Waste Management (Facility Permit and Registration) (Amendment) Regulations S.I. No. 86 of 2008 [79].

Condition 5 of the waste facility permit states that only clean soil and stones from the Construction and Demolition ('C&D') industry are accepted at this WFP. Permitted waste includes Category 17 05 04 (soil & stones free of dangerous substances) from Greenfield sites or low-risk Non-Greenfield sites. All waste must comply with the EPA's 2020 Guidance on Waste Acceptance Criteria [80]. Waste from high-risk Non-Greenfield sites with potential chemical or solid contamination is not accepted. The facility's waste intake is capped at 115,000t over the permit duration, with a maximum of 23,000t per year. Prior to the waste facility, the area was a developed gravel pit. The Site's southern section is classified as greenfield in an agricultural setting.

7.3.2 Topography

A detailed topographical survey conducted in 2023, supported by the contour mapping presented in Figure 7-1 below, provides a clear representation of the existing elevation profile across the site and surrounding lands. The site topography is generally characterised by moderate undulations, with distinct gradients which inform the layout and design considerations of the Proposed Development.

The southern portion of the Site, comprising two primary fields, is relatively level with ground elevations ranging between approximately 160mAOD and 164mAOD, forming a central plateau within the site boundary. Moving westward, the terrain begins to slope down toward the N81 road, with levels dropping to approximately 154mAOD, indicating a relatively moderate decline.

To the south, ground elevations reduce further within the adjoining unauthorised landfill area, typically ranging from 144mAOD to 149mAOD, indicating a more pronounced topographical transition beyond the main extraction area. The eastern scrubland margin of the southern fields exhibits a notable decline from a local high point of 164mAOD, dropping to approximately 141mAOD, before transitioning to a gentler gradient leading toward the river corridor, which lies at a consistent elevation of approximately 141mAOD.

In the northern section of the Site, ground levels also descend from approximately 164mAOD to 150–151mAOD, within the grounds of the existing permitted waste facility. These contours are clearly illustrated on the 2m height interval contour lines shown in Figure 7-1, highlighting the varying gradients across the site, particularly at boundary interfaces and natural drainage pathways.

Overall, the site displays a combination of level working areas and sloping boundary zones, with the predominant fall in elevation toward the west, south, and east. These topographic characteristics will influence both the internal water management strategy and the design of final restoration contours, ensuring alignment with natural drainage patterns and visual integration into the surrounding landscape.

Figure 7-1: Site Topography

7.3.3 Soils

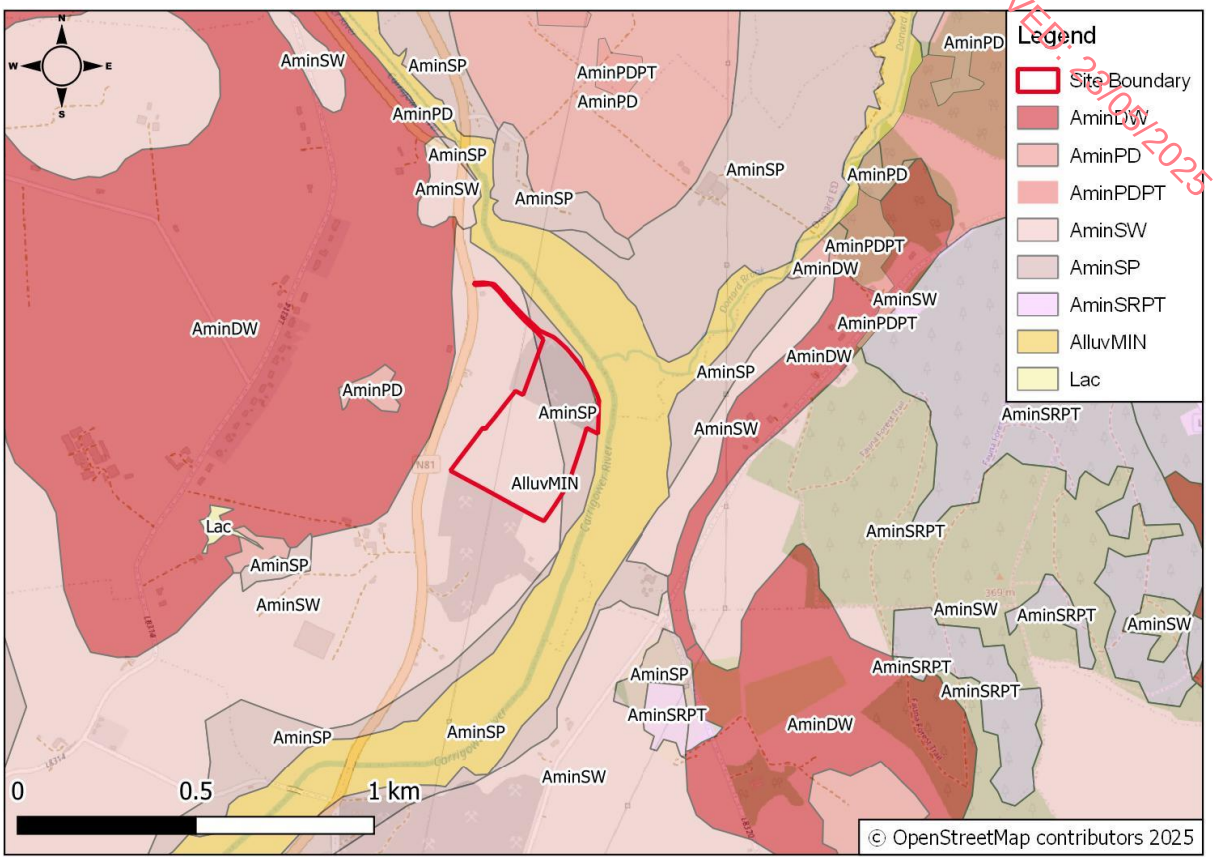
According to the Teagasc soils database presented on the GSI database [27] soil map. The majority of the site comprises soils classified as AminSW – shallow well-drained mineral soils (mainly acidic), associated with the Lithosol and Regosol soil groups. These soils are derived from non-calcareous granite-based materials and are generally free-draining, with low moisture retention and slightly acidic characteristics. These are primarily derived from glaciofluvial sands and gravels, classified as granite sands and gravels ('GGr'). These materials were deposited during glacial meltwater processes and form the dominant parent material underlying the site.

A localised area in the northeastern section of the Site contains soils classified as AminSP – shallow poorly drained mineral soils (mainly acidic). These soils are associated with surface water gleys and groundwater gleys, indicating locally impeded drainage conditions and a greater tendency toward seasonal waterlogging in this part of the site.

In addition, the area adjacent to the eastern and northern boundaries of the site contains soils derived from alluvium (undifferentiated), classified under the Irish Forest Soils ('IFS') as AlluvMIN – mineral alluvial soils. These soils are typically associated with low-lying areas adjacent to watercourses and are variable in texture and drainage characteristics, depending on deposition patterns. The presence of alluvial mineral soils in this area reflects the proximity of the site to a local river corridor and contributes to the heterogeneity of the soil landscape at the site margins [27].

There is no presence of peat or deep organic soils, and overall, the soil profile across the site reflects a mix of mineral soils with varying drainage capacities (refer to Figure 7-2 below).

Figure 7-2: Soil Geology



The Site is underlain by a range of mineral soils derived from glaciofluvial and alluvial parent materials, reflecting both glacial and fluvial depositional environments. Soils in Table 7-1 have been classified and evaluated in accordance with the IEMA (2022) guidance [76], with consideration of soil function, drainage class, parent material, and potential sensitivity.

Table 7-1: IEMA Soil Classification

Soil Type	IEMA Soil Classification	Description	Sensitivity
AminSW (Shallow well-drained mineral – mainly acidic)	Moderate quality agricultural soil; well-drained mineral soil	Predominantly across the site, derived from granite glaciofluvial sands and gravels. Freely draining, shallow profile.	Low to moderate
AminSP (Shallow poorly-drained mineral – mainly acidic)	Low quality agricultural soil; impeded drainage	Occurs in the northeastern section; associated with gleys, limited fertility and workability.	Moderate sensitivity to disturbance
AlluvMIN (Mineral alluvial soil)	Variable soil; hydrologically active zone	Present adjacent to the eastern and northern boundary, associated with river corridor; variable texture, moderate ecological function.	Moderate to high sensitivity (due to hydrological connectivity)

The soils within the Site contribute to a range of important functions, including supporting agricultural productivity (albeit of low to moderate quality), regulating surface water flow and infiltration, and providing a substrate for habitat re-establishment during site restoration. However, no high-value agricultural soils or priority soil types have been identified.

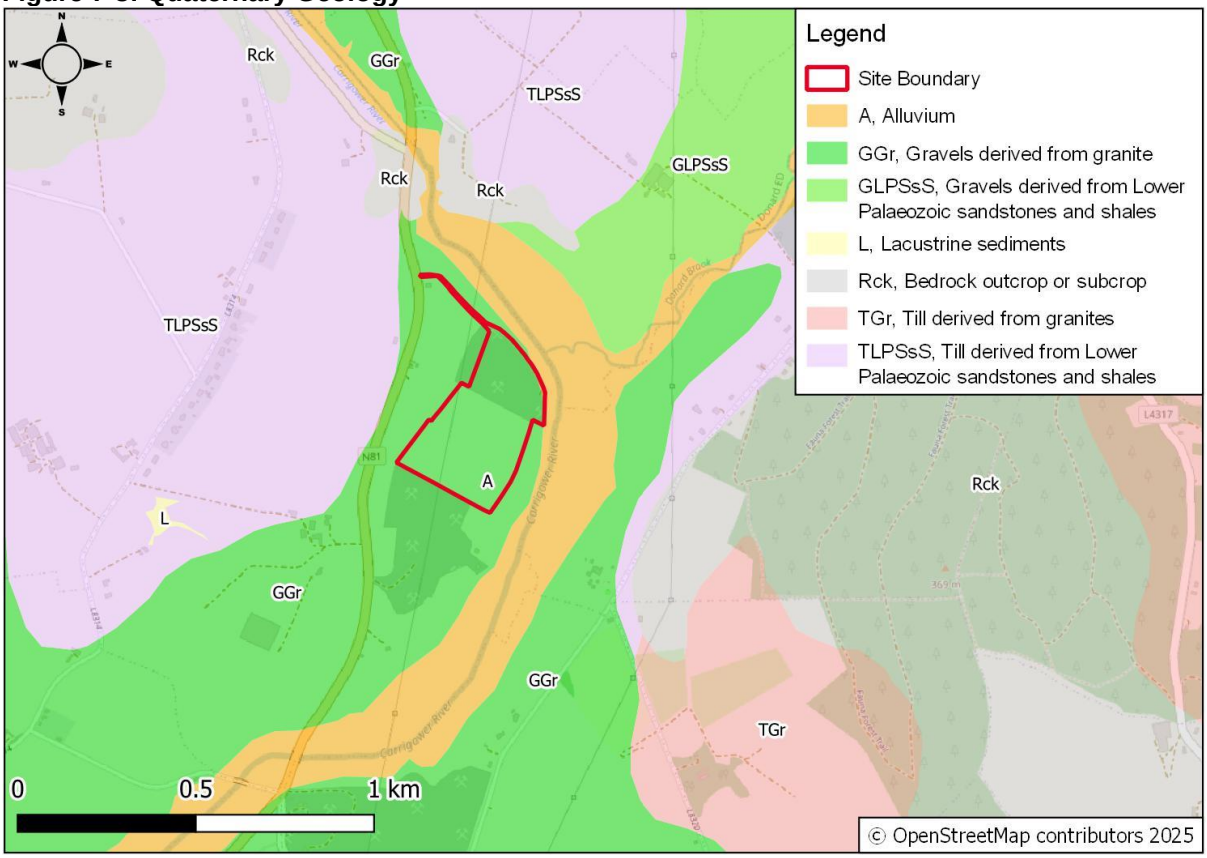
In accordance with IEMA guidance, appropriate soil management measures will be implemented throughout the Site's lifecycle. During Site preparation and excavation, topsoil and subsoil layers will be stripped and stored separately. These stored soils will be reused during the restoration stage, supporting the creation of grassland and wetland habitats, in line with the site's ecological rehabilitation objectives. Overall, the proposed soil management approach seeks to ensure the protection, conservation, and functional recovery of soil resources, in line with best practice and the principles.

7.3.4 Quaternary Geology

The site is underlain by Quaternary sediments, also known as subsoil, classified as Gravels derived from granite, as identified by the GSI (2013) Quaternary Geology Map of Ireland. These sediments are associated with a deglacial landform type described as Hummocky Sand and Gravel, typical of ice-marginal depositional environments formed during the retreat of the last glaciation.

These deposits generally comprise poorly sorted sands and gravels, with occasional cobbles and boulders, and are characterised by irregular, undulating topography with high permeability. The materials are largely derived from the reworking of glacially transported granite, reflecting the geological provenance of the surrounding upland regions. The deposits fully overlie the underlying bedrock. See Figure 7-3 below.

Figure 7-3: Quaternary Geology



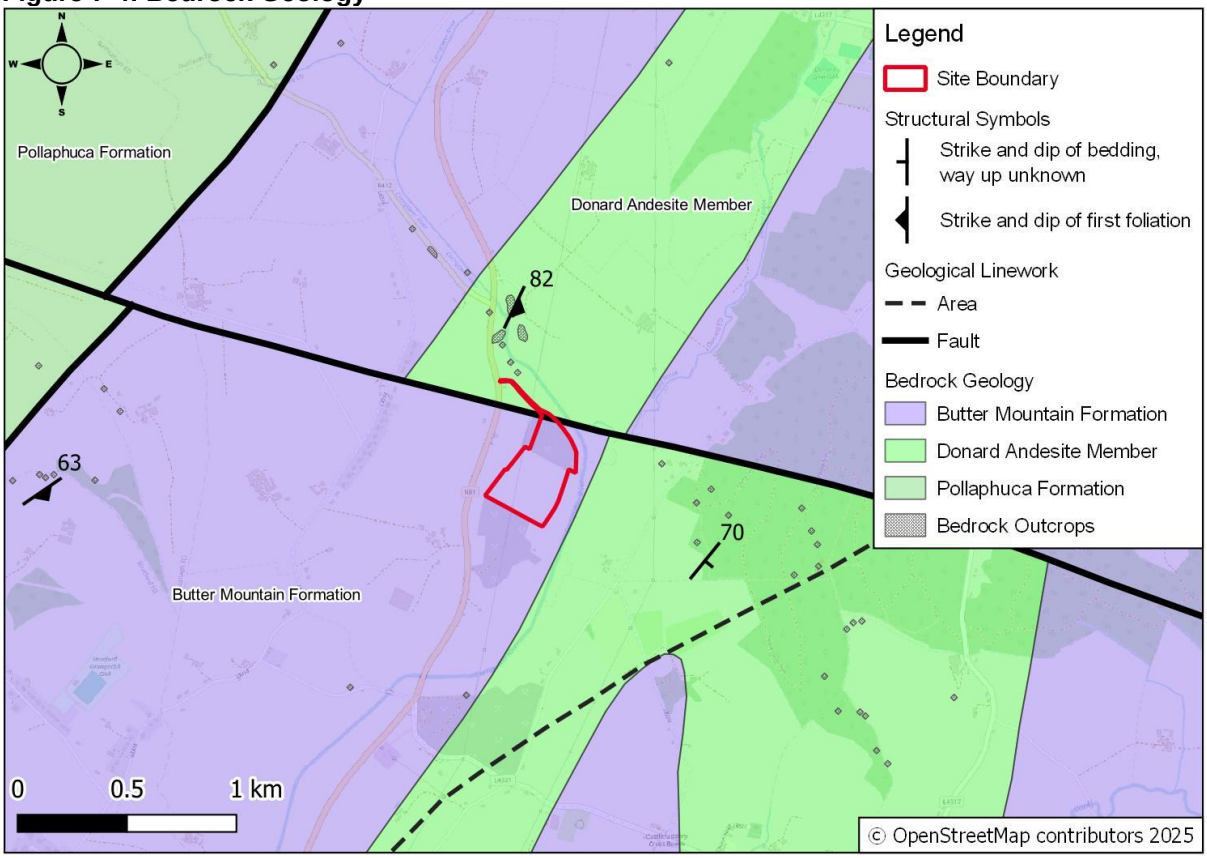
7.3.5 Bedrock Geology

The predominant underlying bedrock geology of the site is classified as the Butter Mountain Formation, which dates from the Lower to Middle Ordovician period of the Palaeozoic era. This formation consists primarily of dark slate-schist, quartzite, and coticule, deposited in a deep marine environment. The Donard Andesite Member is underlying the northern most section of the site.

Although the site is underlain by this bedrock unit, there are no known areas of bedrock outcrop at the surface within the site boundary. The bedrock is overlain by subsoils and overburden, which separates it from the surface throughout the site area.

The bedrock underlying the Site is generally oriented in a north-northeast to south-southwest direction, with a southeasterly dip ranging between 63° and 82°. This structural alignment reflects regional geological trends and may influence subsurface stability and groundwater flow characteristics. Additionally, a mapped east–west trending geological fault is located adjacent to the Site's northern boundary, representing a significant structural feature within the local bedrock framework. This fault delineates the boundary between the Butter Mountain Formation and the Donard Andesite Member to the north. Although the fault has no visible surface expression within the Site, it provides important context for the area's geological evolution and may further influence the orientation and integrity of the underlying rock mass [27] (refer to Figure 7-4 below).

Figure 7-4: Bedrock Geology



7.3.6 Geological Heritage

The Site is not within or adjacent to any Geological Heritage Site.

7.3.7 Economic Geology

The Site contains economically valuable sand and gravel deposits, forming part of the region's broader mineral aggregate resource base and representing a strategically important natural resource used in the production of concrete, asphalt, road base and other essential construction materials. According to the GIS Aggregate Potential Mapping, the Site is located within an area identified as having high aggregate potential, particularly for glaciofluvial sand and gravel [81]. These deposits are associated with hummocky terrain formed during regional deglaciation and are classified as gravels derived from granite, noted for their durable characteristics and broad suitability for a range of construction and infrastructure applications.

The development of the Site for quarrying purposes will enable the sustainable extraction of these locally sourced aggregates, reducing dependence on distant quarries, minimising transport-related emissions and supporting the regional construction supply chain. These materials contribute directly to local and regional infrastructure development and represent an important natural asset in achieving continuity of aggregate supply.

Furthermore, the Proposed Development is consistent with the principles and objectives of the National Minerals Policy Framework, which promotes the sustainable and responsible use of Ireland's natural resources [82]. By facilitating the controlled, environmentally managed, and economically efficient extraction of high-quality aggregate materials, the project supports national policy goals related to resource efficiency, climate mitigation and rural economic development.

7.3.8 Geomorphology

The geomorphological characteristics of the Site reflect the legacy of glacial and post-glacial processes that have shaped the local landscape. The site is situated within a terrain dominated by hummocky glaciofluvial landforms, formed during the retreat of the last glaciation. These features are characteristic of ice-marginal depositional environments, where irregular mounds and undulating terrain developed as a result of the melting and stagnation of glacial ice masses.

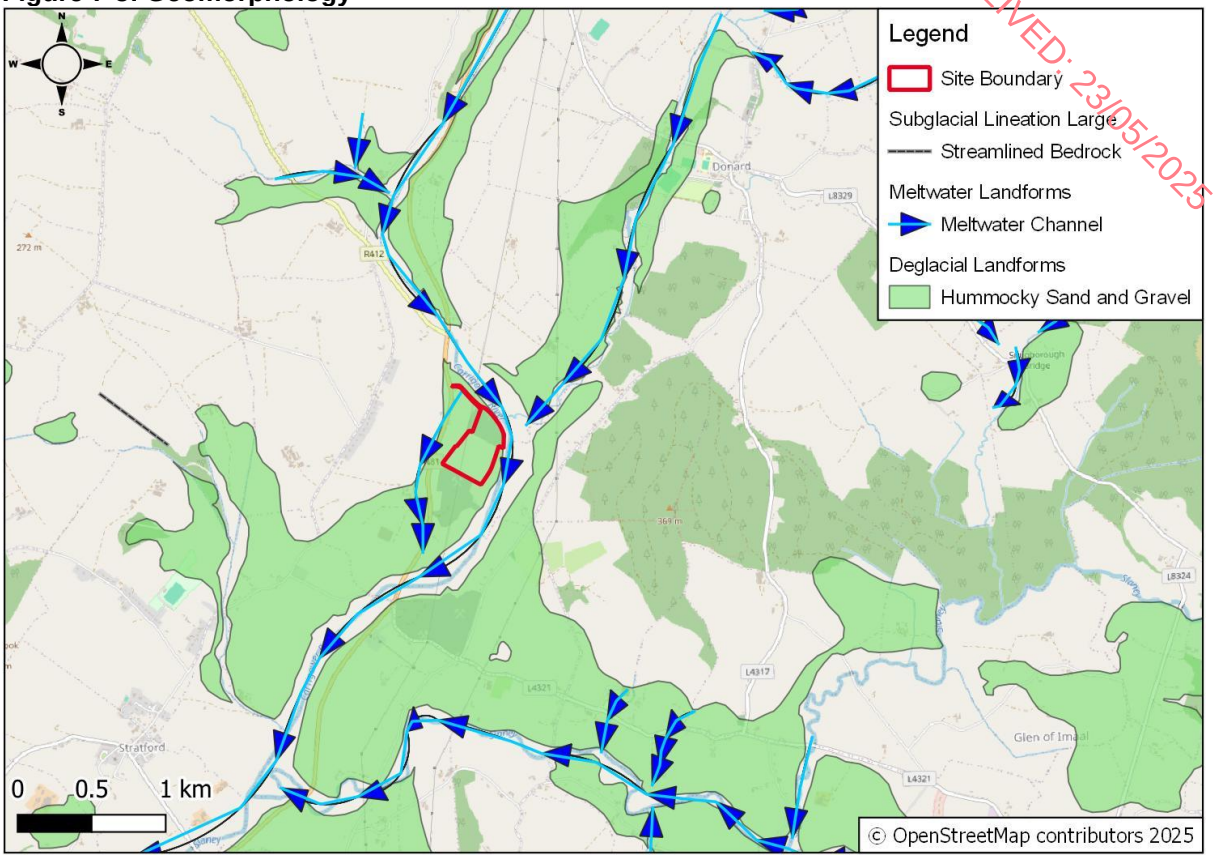
The predominant landform across the site is hummocky sand and gravel, which consists of irregular, gently sloping mounds and depressions composed of poorly sorted granular material derived from glacial meltwater outwash. These features correspond with the underlying granite-derived glaciofluvial sediments, as mapped by the Geological Survey Ireland, and are typical of post-glacial sedimentary landscapes [27].

The Site's topography is relatively subdued across the central and southern fields, with gentle variations in elevation between approximately 163mAOD and 164mAOD, transitioning to more distinct downward gradients toward the western, northern, and eastern boundaries, where elevations drop to 141–154mAOD. These slope transitions are consistent with the glacially shaped surface and natural drainage pathways, particularly where the land gently descends toward the adjacent river corridor along the eastern boundary.

The presence of alluvial deposits along the eastern margin reflects more recent fluvial geomorphological activity, indicating areas influenced by riverine deposition processes during the Holocene period. This transition between glaciofluvial and fluvial processes is an important geomorphological feature of the site, contributing to both its surface variability and sedimentary history.

Overall, the geomorphology of the site is shaped by a combination of glacial deposition, meltwater reworking, and minor fluvial influence, resulting in a complex but stable landform assemblage. These features have been considered in the design of extraction areas, slope regrading plans, drainage infrastructure, and final restoration contours to ensure compatibility with the site's natural landform processes (refer to Figure 7-5 below).

Figure 7-5: Geomorphology



7.4 Characteristics and Potential Effects of the Proposed Development

The Proposed Development involves the phased extraction of aggregate material from a 7.75ha area, with excavation progressing down to a final depth of 143.0mAOD. The Site will be developed in four distinct phases, divided between northern and southern sections, with Phase One and Phase Three involving the removal and on-site storage of topsoil. The stripped topsoil will be retained in managed stockpiles for reuse in the restoration stage.

Construction and operational stages will overlap, with extraction works commencing in areas where enabling infrastructure has already been established. This staged approach enables early operational activity to proceed in tandem with the phased completion of earthworks elsewhere on the Site.

Site infrastructure will include the installation of a settlement pond, shed and an associated concrete plinth and drainage system. Following the cessation of extraction activities, the Site will undergo restoration (refer to Appendix 6-1).

The principal long-term effect of the Proposed Development on the soil environment arises from the permanent removal of aggregate materials as part of the extraction process. This material, while classified as a natural resource of economic value, also forms part of the wider soil profile and geological framework.

Additional potential effects related to the Proposed Development are as follows;

<u>Temporary Loss of Soil Functionality:</u>

The removal of topsoil for extraction activities will temporarily remove the soil from productive use.

Soil Structure Degradation:

Improper handling or prolonged stockpiling of soil can lead to compaction, loss of soil structure, and reduced biological activity.

Erosion and Runoff:

During excavation and soil stripping, there is a potential for increased erosion and sediment runoff.

Contamination Risk:

The use of machinery and installation of infrastructure introduces a low risk of accidental spills or leaks, which could potentially contaminate stored and in-situ soils.

Permanent Land Use Change:

The site will undergo a temporary change in land use from agricultural land to a mineral extraction facility.

Although topsoil will be stripped, stored, and reused as part of the Site restoration strategy, the mineral subsoil (aggregate) itself will be permanently removed and will not be reinstated in its original form or function. This represents a non-renewable loss of soil resource, particularly in terms of its structural, hydrological and ecological functions.

However, this permanent change must be considered in context:

- The affected area is relatively modest in scale (7.75 ha) and already zoned for extractive industry use;
- The economic benefit and national policy support for sustainable mineral extraction are recognised in the National Minerals Policy Framework [84]; and,
- The development includes a robust restoration plan, which ensures the long-term reinstatement of soil cover and beneficial after-use (i.e. grassland and wetland habitat).

Therefore, while the removal of subsoil and aggregate is acknowledged as a permanent loss, the impact is considered not significant, particularly given the temporary nature of topsoil disturbance and the environmental benefits of the proposed restoration strategy.

While there will be a temporary loss of agricultural productivity over the 15–16-year operational period, this is considered reversible. The Proposed Development will change land use from agriculture to mineral extraction during operation; however, the proposed restoration plan will ensure that the Site is returned to beneficial post-extraction use. Therefore, the effect of the Proposed Development on land use is considered to be not significant.

7.5 Mitigation Measures for Identified Potential Effects

The mitigation measures for protecting soils, geology, surface water, and groundwater are related to soils and geology and are described below and in Chapter 8.

The primary effects on soils and land quality arising from the development include:

Temporary Loss of Soil Functionality:

Topsoil will be stored on-site and reused during Site restoration to reinstate productive land use.

Soil Structure Degradation:

Handling will be weather-sensitive, with segregation of soil types and minimisation of compaction during stockpiling to preserve soil structure and biological integrity.

Erosion and Runoff:

Controlled excavation phasing, surface water management systems, and appropriate containment of stockpiles will be implemented to reduce erosion and sediment runoff.

Contamination Risk:

Mitigation will include storage areas, oil-water separators, and designated refuelling zones to prevent soil contamination from spills or leaks.

Permanent Land Use Change:

The restoration plan includes the creation of wetland and grassland habitats, enhancing post-extraction land contributing to biodiversity.

7.5.1 Soil Management

In addition, the stockpiling of excavated material will be required and will be appropriately managed on-site in accordance with best practice. All topsoil will be stored in designated stockpiles for use during the restoration stages of the Site. The removal and storage of topsoil will be undertaken in line with best practice guidance, including recommendations from the Department for Environment, Food and Rural Affairs [77].

The Proposed Development will be divided into two sections—northern and southern—separated by an existing hedgerow running west to east. The extraction works will be phased accordingly over the operational lifetime of the quarry. The estimated volumes of topsoil to be removed during each phase are outlined below:

- Phase 1: Excavation will commence in the northern section, with material excavated at a slope gradient of 1:1.5 down to an elevation of 153.0mAOD. Approximately 9,600m³ of topsoil will be removed from an area of approximately 32,000m² (refer to Drawing No. MW230824 Phase 1 Overview);
- Phase 2: A bench will be created at 153.0mAOD, followed by further excavation of the northern section down to the final quarry floor level of 143.0mAOD, again at a 1:1.5 slope. Upon achieving the proposed base level, a 13.0m by 60.0m settlement pond will be constructed in the northeast corner, with a final depth of 139.8mAOD. The surrounding quarry floor will be graded to 142.8mAOD to promote natural drainage into the pond. Additionally, a 3.0m by 8.0m generator shed will be installed adjacent to the pond, along with an 8.0m by 8.0m concrete plinth at the shed entrance. A drainage line will direct runoff from the plinth through an oil/water separator before discharge into the settlement pond (refer to drawing No. MW230824 Phase 2 Overview);
- Phase 3: Excavation works will commence in the southern section, where overburden will be removed from ground level at a 1:1.5 slope down to 153.0mAOD. Approximately 13,667m³ of topsoil is expected to be removed from an area of approximately 45,555m² (refer to drawing No. MW230824 Phase 3 Overview);
- Phase 4: A bench will be constructed at 153.0mAOD in the southern section, with further excavation to the final quarry floor level of 143.0mAOD, continuing at a 1:1.5 slope (refer to drawing No. MW230824 Phase 4 Overview);
- The topsoil layer will be carefully stripped and stored separately in appropriately sited stockpiles to maintain its structure, fertility, and suitability for future restoration and landscaping;
- Soil stripping and stockpiling operations will be avoided during periods of excessively dry or wet weather to minimise the risk of structural degradation and compaction;

- Stockpiles will be clearly marked and segregated to differentiate between soil types and to ensure proper material handling during reinstatement stages;
- Stockpiles will be managed to prevent unnecessary compaction, particularly within the core to avoid anaerobic conditions that may reduce the biological functionality of the soil;
- Movement of construction traffic will be restricted to predefined haul routes to minimise disturbance and compaction of surrounding soils; and,
- No topsoil will be transported off-site. All excavated topsoil will be retained for on-site restoration and landscaping purposes.

7.6 Cumulative and In-Combination Effects

The Proposed Development will have a permanent and irreversible effect on the hydrology, hydrogeology, soils, or geology; However, assuming full implementation of the proposed mitigation measures and restoration plan the potential effect is considered not significant.

7.7 Interactions with Other Environmental Attributes

Land and soils 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 sand and gravel are key elements to the viability of this project. However, this change will impact biodiversity. The effects on biodiversity are addressed in Chapter 6; however, no likely significant effects were identified;
- Chapter 8 - Water: The soil removal will alter the underlying groundwater's sensitivity; further assessment is provided within Chapter 8 Water. Additionally, soil reworking and bedrock extraction could release suspended solids and other material into the on-site drainage system and thereby to the on-site discharge. The effects on water quality are addressed in Chapter 8; however, no likely significant effects were identified;
- Chapter 9 - Air : the mobilisation of dust through extraction processes can impact air quality. The effects on air quality are addressed in Chapter 9; however, no likely significant effects were identified; and,
- Chapter 14—Landscape & Visual: Modifying local geomorphology and topology through the extraction of bedrock onsite will likely impact the area's visual and landscape character. However, no likely significant effects were identified.

7.8 Indirect Effects

No indirect effects related to land, soil and geology were identified as part of the Proposed Development or historic on-site activities.

7.9 Residual Effects

The mitigation measures outlined in Section 7.5 and Chapter 8 will ensure that the residual effects on soils arising from all stages of the Proposed Development are not significant. While the removal of soils for aggregate extraction will result in a change to the Site's land profile, this effect is considered a long-term, slight negative impact that is manageable through the implementation of best practice soil conservation and restoration measures.

Following the application of these mitigation measures and taking into account the comprehensive reinstatement strategy, it is concluded that the Proposed Development will not give rise to any likely significant effects on land, soils, geology, or geological heritage. Therefore, the overall residual effects are assessed as long-term, slight, and not significant.

7.10 Monitoring

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

7.11 Reinstatement

Following the completion of extraction activities, the Site will undergo a comprehensive reinstatement and restoration process designed to return the land to a productive and environmentally sustainable condition. The strategy has been developed in accordance with best practice guidance and is intended to restore soil functionality and ensure long-term integration of the site with the surrounding landscape.

The restoration stage will be carried out in line with a dedicated Restoration Plan, which has been prepared by MOR Environmental and accompanies this planning application (refer to Appendix 6-1).

7.12 Difficulties Encountered in Compiling this Information

No difficulties were encountered when compiling this information.

8 WATER

8.1 Introduction

This chapter of the EIAR describes and assesses the likely effects of the Proposed Development on the hydrological (surface water) environment in the vicinity of the Site and the hydrogeological (groundwater) environment beneath the Site.

8.2 Methodology

The water assessment for this EIAR is underpinned by a structured methodology that integrates the legislative context, comprehensive desk-based studies, targeted site investigations, and impact assessment techniques. This methodology ensures that water resource evaluation is systematic and complies with relevant regulatory frameworks.

8.2.1 Legislation Context

The EU Water Framework Directive (WFD) (2000/60/EC), as amended by Directives 2008/105/EC and 2013/39/EU, establishes a comprehensive framework for the protection and management of surface waters and groundwaters across the EU [83]. In Ireland, the WFD was transposed into national law through the European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003), as amended by S.I. No. 413 of 2005, S.I. No. 350 of 2014, S.I. No. 166 of 2022, and S.I. No. 52 of 2025 [84].

Surface water quality is protected and assessed under the European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I. No. 272 of 2009) [85], as amended by S.I. No. 327 of 2012, S.I. No. 386 of 2015, S.I. No. 77 of 2019, S.I. No. 410 of 2023 and S.I. No. 50 of 2025. Groundwater is assessed and protected under the European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No. 9 of 2010) [86], as amended by S.I. No. 149 of 2012, S.I. No. 287 of 2022, and S.I. No. 51 of 2025.

These legislative instruments outline the necessary measures to achieve and maintain high water status, prevent deterioration of existing water quality, and safeguard aquatic ecosystems. Since water bodies are intrinsically connected to the ecosystems they support, attaining 'good' status for both surface and groundwater resources depends significantly on the health and resilience of these ecosystems.

The WFD is implemented and managed in Ireland through the use of six-year cycles of the River Basin Management Plans (RBMPs) that enable regular assessment, planning, implementation, and review of water quality measures. The first cycle of the RBMP ran from 2009 to 2015. During this cycle, Ireland was divided into eight River Basin Districts (RBDs) with the goal of achieving at least 'good' status for all waters by 2015. The second cycle ran from 2018-2021 and adopted a fresh, innovative approach to protecting, enhancing, and sustainably managing Ireland's aquatic environment. It relies heavily on cross-sectoral collaboration and represents a fundamental shift in how the State engages with communities, organizations, and individuals to address challenges [87].

The current (third) cycle runs from 2022-2027, and the associated RBMP was named "Water Action Plan 2024" and published in September 2024 [88], following public consultation. 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 a result, the island has been divided into four RBDs – one national RBD falling fully within the Republic of Ireland (ROI), two RBDs, with territory both within ROI and NI and one RBD that falls fully within NI. The draft RBMP sets out how Ireland will manage its water resources and catchments between 2022 and 2027.

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

- National Roads Authority (NRA) Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes [35].
- Institute of Geologists Ireland ('IGI') Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements [72];
- CIRIA C532 - Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors [49];
- Department of Environment, Heritage and Local Government: Quarries and Ancillary Activities - Guidance for Authorities [74]; and
- EPA Environmental Management in the Extractive Industry (Non-Scheduled Minerals) [75].

8.2.2 Desk-based Study

The study area assessed as part of the desk study comprised the Proposed Development Site and the immediate surrounding area. This boundary was defined based on the scale and nature of the Proposed Development, the extent of anticipated environmental effects, and the availability of relevant data. While the Institute of IGI Guidelines recommend a 2km study area, this wider extent was not deemed necessary in this case, as no significant geological or hydrogeological linkages or potential receptors were identified beyond the immediate vicinity of the site. Should potential pathways or receptors of concern beyond this area have been identified, the study area would have been extended accordingly in line with IGI guidance.
A desk study of the Site and surrounding area was carried out to collate all available and relevant hydrogeological and hydrological for the study area, using the following data sources:

- Geological Survey of Ireland ('GSI') [27];
- EPA Maps database [78];
- EPA Catchments [89];
- EPA Leap Online [90];
- Office of Public Works (OPW) 'Flood Maps' [91]; and,
- O'Rourke Well Drilling Ltd. Rotary drilling logs.

8.2.3 Site Investigations

No intrusive site investigations were completed in the extraction area as part of this application. This decision was based on the availability of existing geological and hydrogeological data within the immediate area of the Proposed Development. The project involves the extension of a former sand and gravel pit, where ground conditions have been well characterised through historical extraction activities. Additionally, the Proposed Development adjoins the Brownfield Restoration Ltd. site to the south, from which detailed ground investigation data was available and has been reviewed to inform the current assessment.

8.2.4 Impact Assessment Methodology

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

8.3 Receiving Environment

8.3.1 Hydrogeology

This section describes the area's groundwater features and those potentially relevant to the assessment.

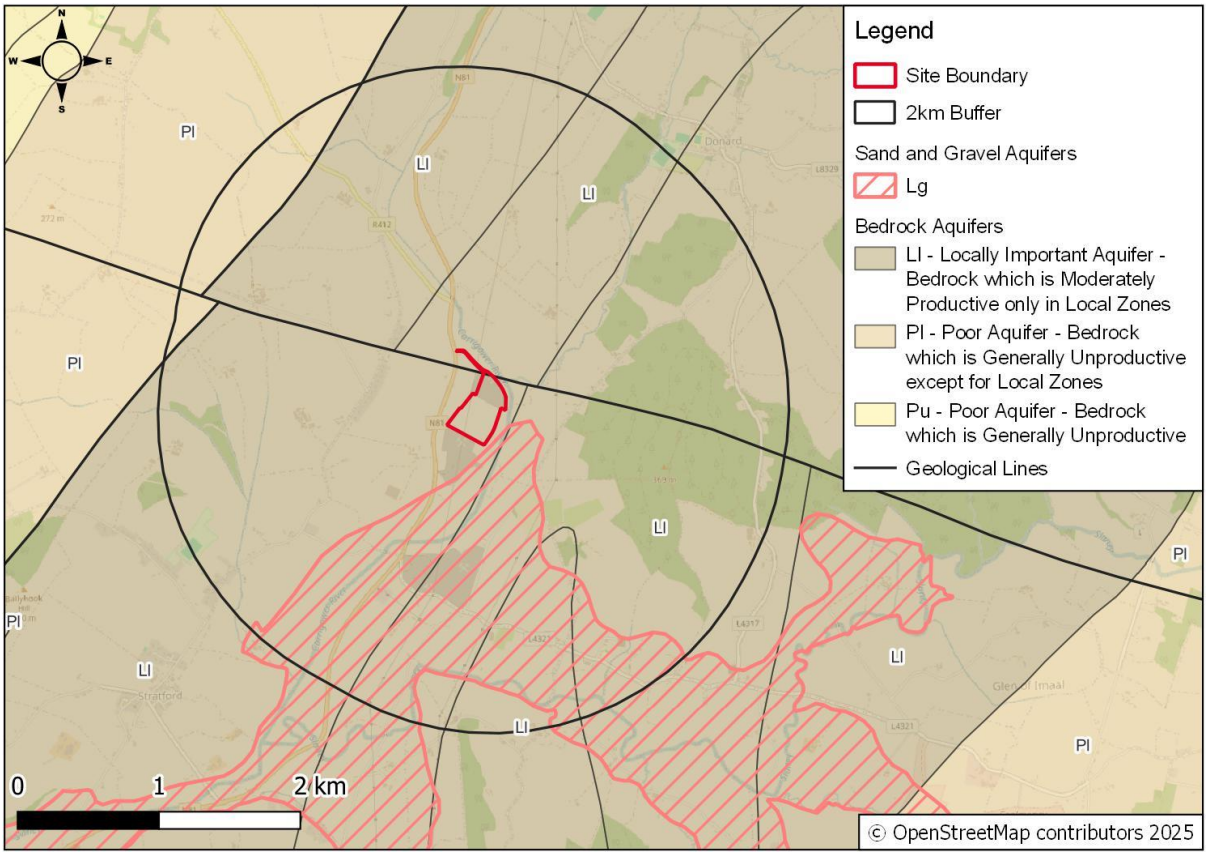
8.3.1.1 Bedrock Aquifer

The aquifer potential of a bedrock unit is determined by the groundwater productivity, which in turn is determined based on hydraulic characteristics compiled from borehole data throughout the country. The GSI categorises the aquifer bodies into Regionally Important Aquifers, Locally Important Aquifers and Poor Aquifers. These are then subcategorised to create a total of seven bedrock aquifer categories and two sand and gravel aquifer categories.

The GSI bedrock aquifer database [27] indicates that both the Butter Mountain Formation and the Donard Andesite Member (described in Section 7.3.5 of Chapter 7) are classified as a Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones ('Ll'). There is a locally important gravel aquifer (Lg) directly south of the Site which corresponds with the gravel subsoil deposits described in Section 7.3.4 of Chapter 7).

No karst features are mapped within a 5km radius from the Site.

Figure 8-1: Bedrock Aquifer



8.3.1.2 Groundwater Vulnerability

Groundwater vulnerability represents the intrinsic geological and hydrogeological characteristics that determine how easily groundwater may be contaminated by activities at the surface. Vulnerability depends on the quantity of contaminants that can reach the groundwater and the time taken by water to infiltrate to the water table. These factors are

controlled by the type of subsoils that overlie the groundwater, the way in which the contaminants recharge the geological deposits (whether point or diffuse) and the unsaturated thickness of geological deposits from the point of contaminant discharge.

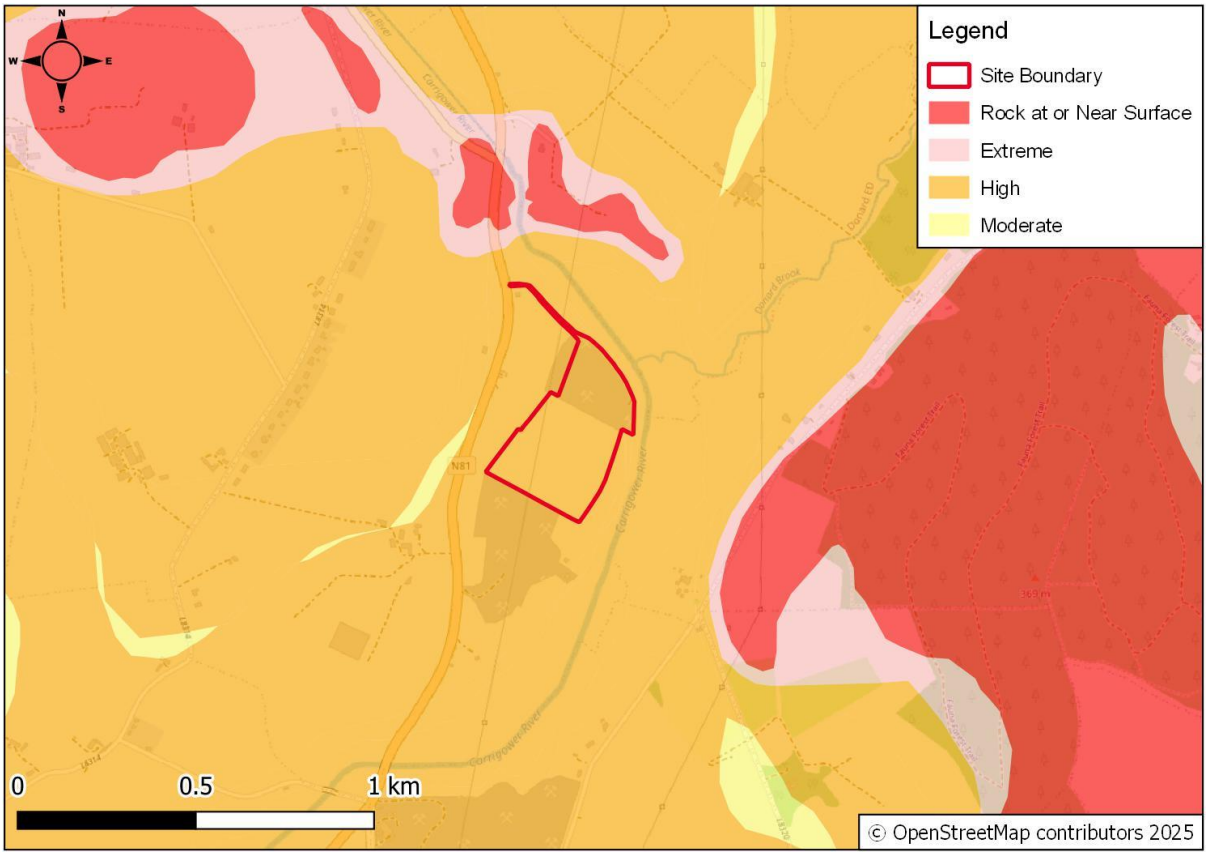
The Groundwater Vulnerability Map is based on the type and thicknesses of subsoils (sands, gravels, glacial tills (or boulder clays), peat, lake and alluvial silts and clays) and the presence of karst features. Groundwater that readily and quickly receives water (and contaminants) from the land surface is more vulnerable than groundwater that receives water (and contaminants) more slowly and consequently in lower quantities.

Groundwater is most at risk where the subsoils are absent or thin and in areas of karstic limestone, such as the Site. Because of the close interaction between surface water and groundwater in karstified aquifers, any contamination of surface water would be rapidly transported into the groundwater system, and vice versa.

From the GSI dataset [27], the Site is classified as having High (H) groundwater vulnerability.

It should be noted that the Proposed Development will remove overburden and expose bedrock beneath the Site. As operations remove the overburden, areas extracted will become reclassified as having Rock at or near Surface or Karst groundwater vulnerability.

Figure 8-2: Groundwater Vulnerability



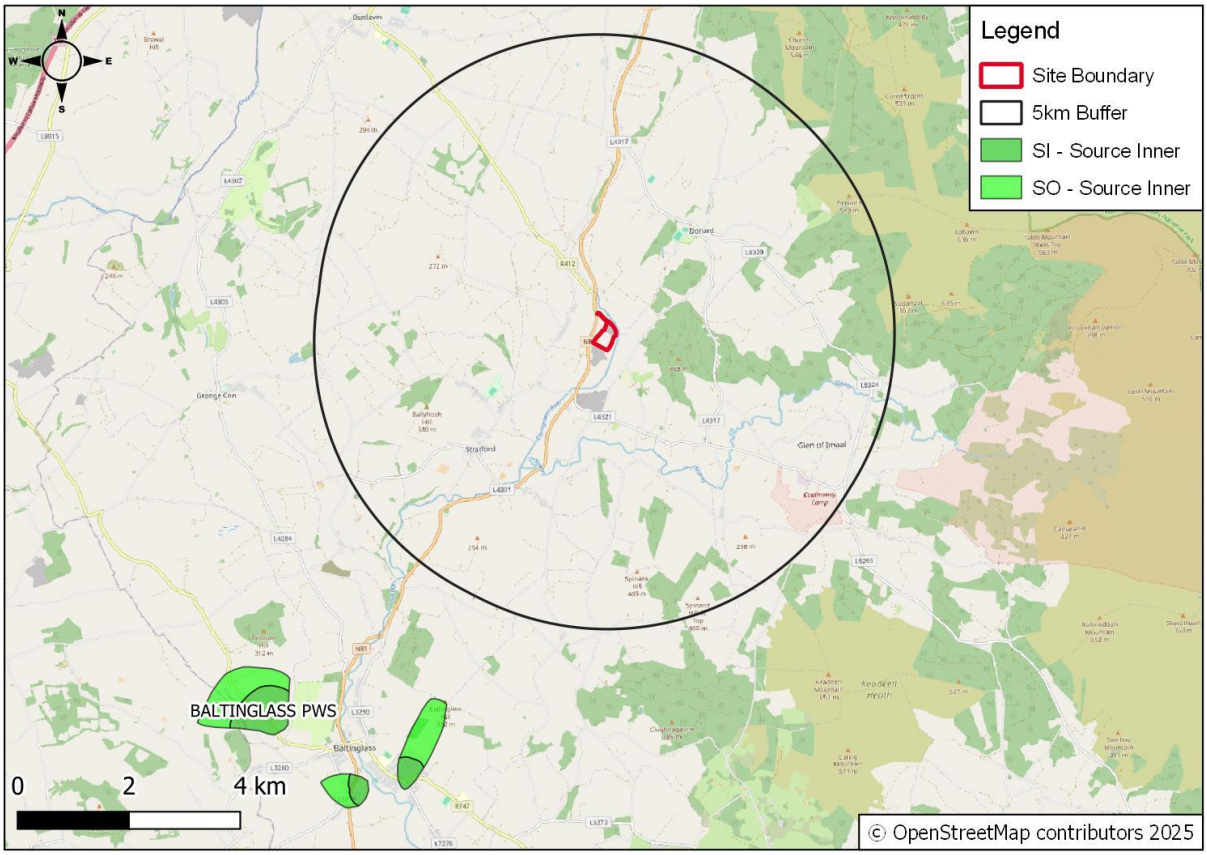
8.3.1.3 Groundwater Protection and Use

As reported by the EPA and the GSI, groundwater sources, particularly public, group scheme and industrial supplies, are of critical importance in many regions. Consequently, the objective of a Source Protection Zone is to provide a framework for protecting groundwater source zones (i.e. areas of contribution to water supply wells) protection by placing tighter controls on activities within all or part of the source protection area of the supply. Groundwater Source

Protection Zones ('SPZs') and Zones of Contribution ('ZOCs') are delineated areas which have been proven to contribute groundwater to a borehole or spring.

There are no source protection areas within 5km of the Site. The nearest source protection area is the Source Outer ('SO') area for the Baltinglass PWS, located ca. 6.9km southeast of the Site. Refer to Figure 8-3 below.

Figure 8-3: Groundwater Source Protection Areas



The GSI maintains a database of the registered wells and springs throughout the country. The location of these wells and springs features is represented by a circle, the diameter of which varies depending on the location accuracy of the feature. The coordinates of the features are representative of the centre of the circle, however this does not guarantee that the well or spring will be located at that exact point.

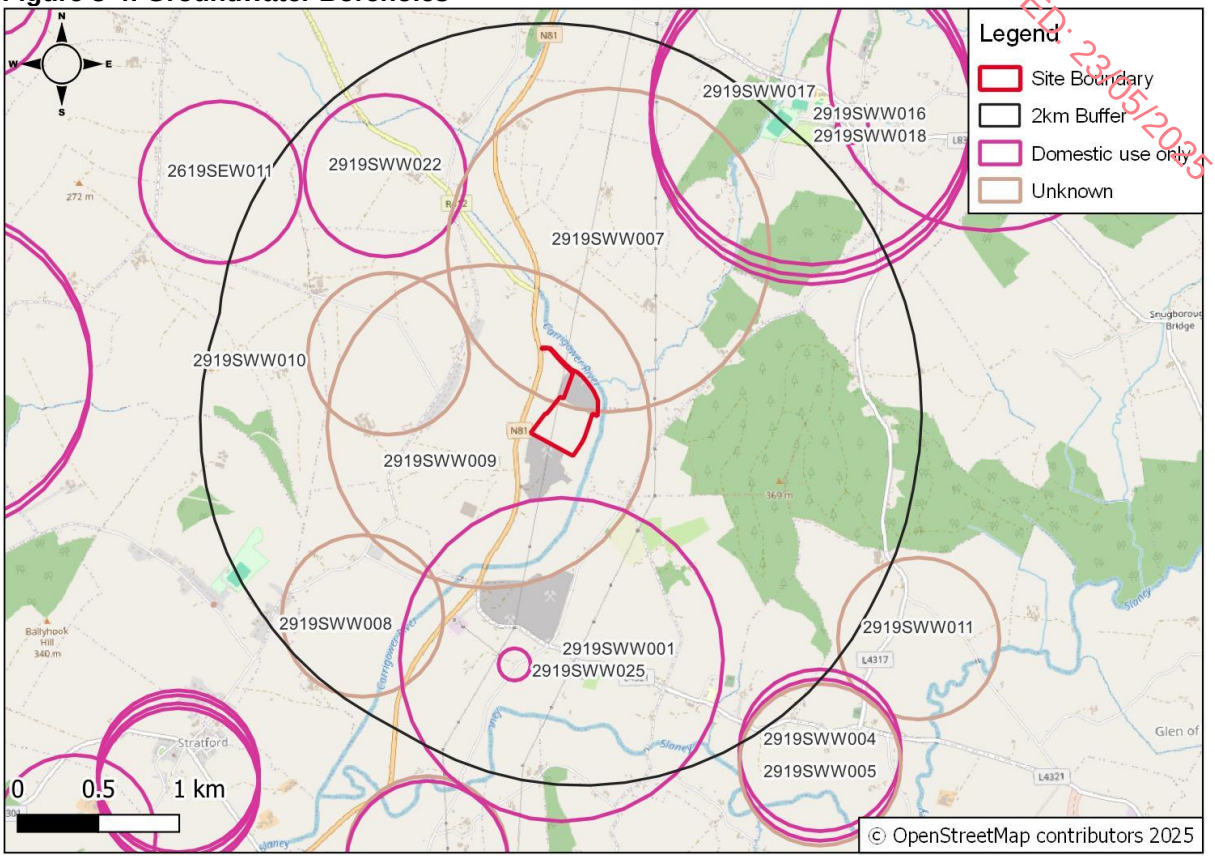
A search of the GSI groundwater well database identified 14 registered wells within a 2km radius of the Site. Refer to Table 8-1 and Figure 8-4 below for details.

Table 8-1: Available Groundwater Well Information

Borehole ID	Centre Distance from Site	Grid Reference (Irish Grid)	Well Type	Total Depth (m)	Townland	Yield (m^3d)
2919SWW004	to within 1km	292950 193750	Dug well	1.5	DAVIDSTOWN	-
2919SWW005	to within 1km	292950 193690	Dug well	2.1	DAVIDSTOWN	-
2919SWW007	to within 2km	291640 196840	Borehole	27.1	BALLYLION	33

Borehole ID	Centre Distance from Site	Grid Reference (Irish Grid)	Well Type	Total Depth (m)	Townland	Yield (m^3d)
2919SWW008	to within 1km	290120 194580	Dug well	10.7	RANDALSTOWN	33
2919SWW009	to within 2km	290900 195750	Borehole	21.3	WHITESTOWN	-
2919SWW010	to within 1km	290280 196200	Dug well	3.7	WHITESTOWN UPPER	-
2919SWW011	to within 1km	293560 194440	Dug well	0.9	KELSHAMORE	-
2919SWW022	to within 1km	290260 197300	Borehole	43.6	RAHEEN	55
2919SWW025	To within 200m	291060 194280	Borehole	39.6	CASTLERUDDERY LOWER	30
2619SEW011	to within 1km	289240 197260	Borehole	15.2	MOANVAWN	22
2919SWW016	to within 2km	292900 197750	Borehole	20.1	DONARD	27
2919SWW017	to within 2km	292900 197680	Borehole	25.9	DONARD	38
2919SWW018	to within 2km	292900 197630	Borehole	20.7	DONARD	33
2919SWW001	to within 2km	291350 194310	Borehole	21.9	CASTLERUDDERY	-

Figure 8-4: Groundwater Boreholes



8.3.2 Groundwater Levels and Flow Direction

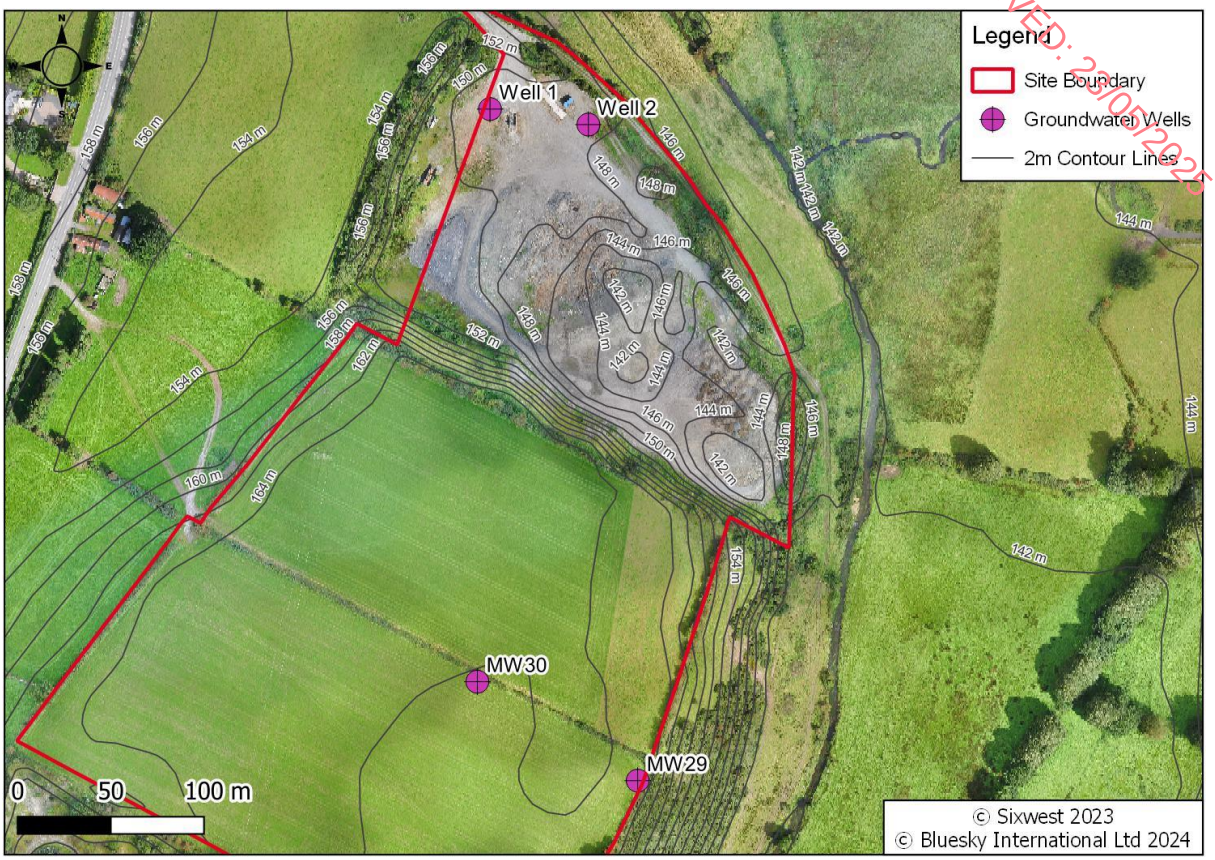
Between November 11th and 12th, 2021, two groundwater wells were drilled at the Site by O'Rourke Well Drilling. The borehole logs initially identified the well locations as "beside wash bay" and "east boundary ditch." These wells have since been renamed Well 1 and Well 2, respectively. According to the borehole logs, the ground elevation was documented as 142m for Well 1 and 141m for Well 2. However, as no reference datum was included in the logs, this elevation is assumed to be in mAOD.

- Well 1 was drilled to a depth of 91.44 meters below ground level (m bgl); and,
- Well 2 was drilled to 73.15 m bgl.

At the time of installation, the static water level in both wells was recorded at 12.19 m bgl, approximately 129.3 mAOD (refer to Appendix 8-1).

During a site visit on 2nd November 2023, a MOR Environmental representative identified two previously undocumented wells, designated MW29 and MW30, situated in the undeveloped section of the site, south of the permitted waste facility (refer to Figure 8-5). The wells were measured at 10.8m and 12.65m total depth, respectively. When revisited on 30th November 2023, for water level measurements, both wells were found to be dry at the time of inspection. The elevation of the wells was not recorded; however, based on a topographical survey in 2023 completed by Bluesky International Ltd, the Site is relatively level at ca. 163-164mAOD in the area of the 2 wells (MW29 and MW30).

Figure 8-5: Wells MW29 & MW30



The unauthorised landfill, PR052224, located south of the Site, developed an Environmental Impact Statement (EIS) as part of the proposed integrated waste management facility application. A network of twenty-two monitoring wells, including 2 wells to the east and 1 well to the west of the Site were identified with the EIS. The remaining 19 wells were advanced south of the Site. Groundwater levels were measured between December 2003 and February 2004. A general groundwater flow map for the unauthorised landfill and surrounding area was developed using data from 3rd February 2004 (Figure 3.7.4 of the EIS report) [90].

The findings indicate that groundwater flows predominantly from northwest to southeast. The average hydraulic gradient across the site was estimated to range between 0.02 and 0.03 [90]. Please refer to Appendix 8-2 and Appendix 8-3 of this report. All groundwater data collected as part of the EIS for the proposed integrated waste management facility application, located to the south and presented in this report, only applies to that area and may not reflect the Site's conditions.

The proposed excavation depth for the undeveloped section of the Site is expected to be 143mAOD. Although no wells have been drilled to groundwater in this area to confirm the groundwater level, no groundwater is expected to be encountered during the construction or operational stages. This hypothesis is based on the permitted waste facility to the north and the unauthorised landfill to the south of the undeveloped section of the Site, both showing a ground elevation of 142mAOD with no record of groundwater ingress (refer to Figure 8-3).

8.3.2.1 Groundwater Supply

An on-site water supply assessment was completed for the Site and focused on the existing wells and surface water sources. Due to the protected status of a nearby river (refer to Section 6.4), it was deemed unsuitable for abstraction and was excluded from further investigation.

The two on-site abstraction wells that were installed in November 2021 by O'Rourke Well Drilling included a one-hour pump test conducted on the day of installation, which yielded for following results:

- Well 1 (beside wash bay) – Drilled to 91.44m, maximum yield 0.36m³/hr; and,
- Well 2 (east boundary ditch) – Drilled to 73.15m, maximum yield 2.05m³/hr.

Between 25th and 30th November 2024, a two-stage assessment was undertaken to further assess the on-site groundwater supply: first, a step test to understand how the well reacts under pressure (abstraction), and then a longer-term pump test to understand how it reacts under prolonged pressure.

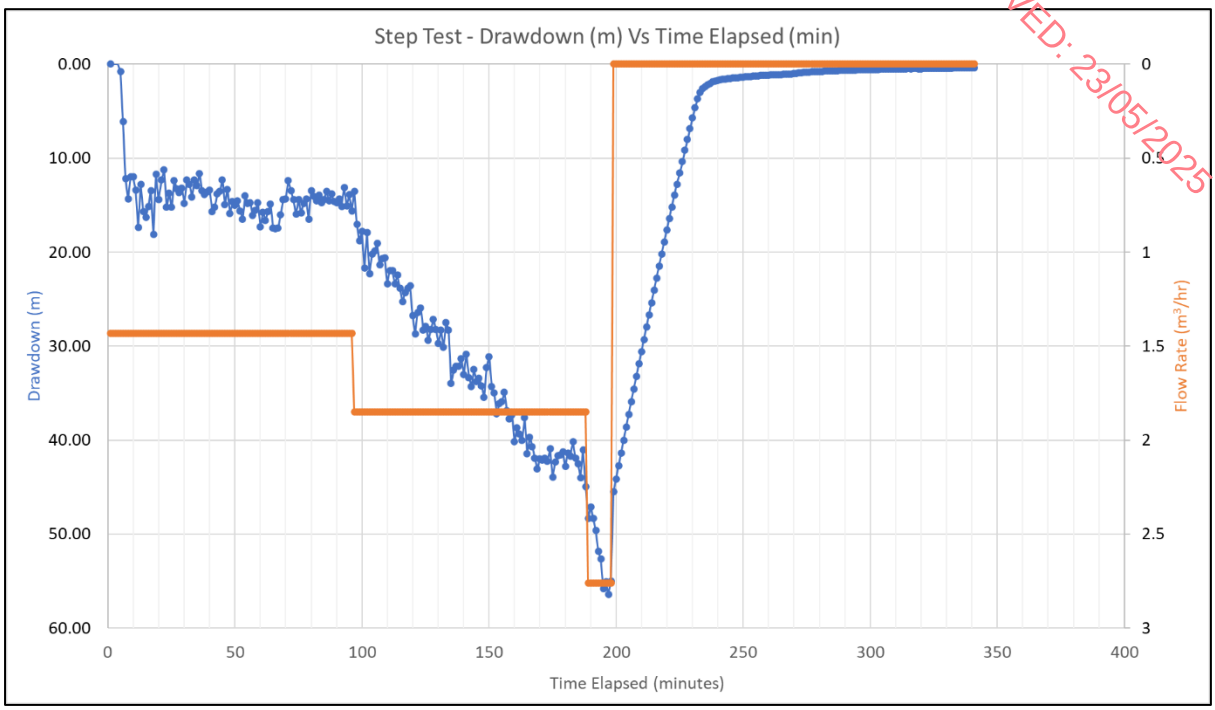
Step Test

The Applicants commissioned MOR Environmental to supervise and process the data of a step test of Well 2 conducted on-site by Pat & Mark Dempsey Well Drilling (Dempsey's). Prior to the step test, on 25th November 2024, Dempsey's performed well rehabilitation operations on Well 2. A step test was carried out on Well 2 on 26th November 2024, and consisted of four steps which included:

- Step 1 at ca. 1.4m³/hr. This step lasted for ca. 100 minutes and water levels appeared to stabilise with a drawdown of ca. 15m;
- Step 2 at ca. 1.8m³/hr. This step also lasted for ca. 100 minutes. The abstraction rate in this step was only a slight increase from Step 1 but resulted in a significant drawdown of ca. 45m. Water levels did not appear to stabilise toward the end of the step;
- Step 3 at ca. 2.8m³/hr. This step only lasted for ca. 10 minutes because the drawdown in water level became too close to the pump level, and so the test had to be stopped early; and,
- Step 4 at 0m³/hr (recovery step). A recovery response in the well was recorded immediately after pumping stopped, and water levels were back to the starting level within ca. 100 minutes.

The results of this step test are presented in the graph shown in Figure 8-6 below.

Figure 8-6: Step Test Results



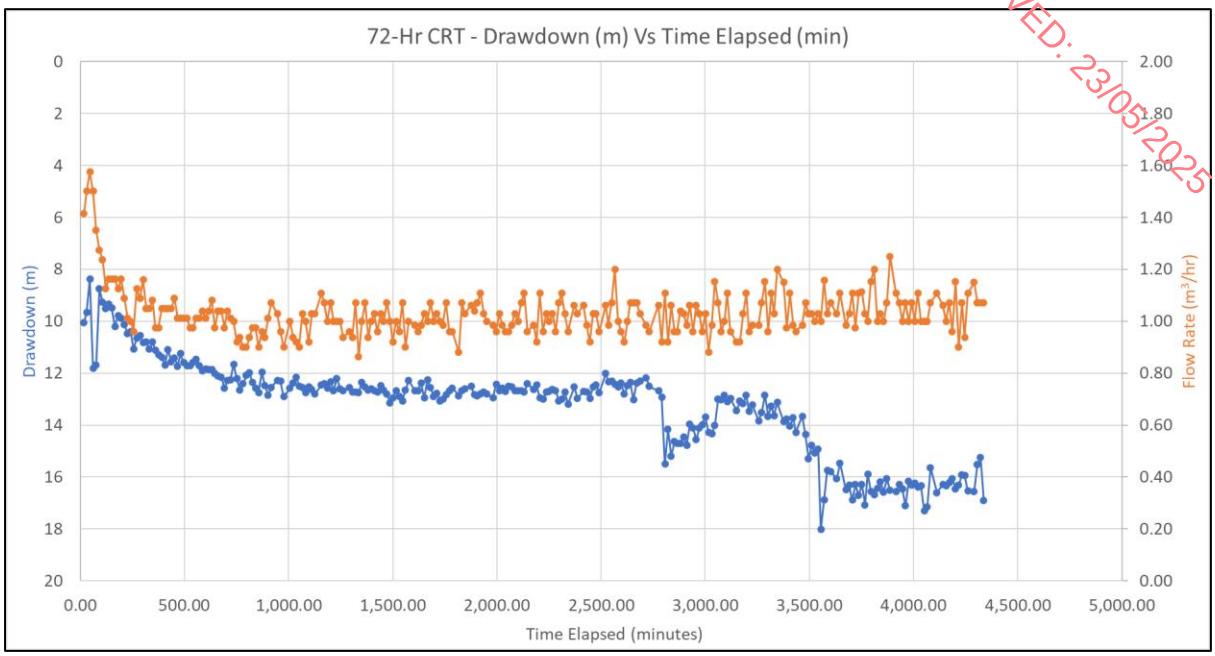
72-hour Constant Rate Discharge Test

Following on from the step test, Dempsey's conducted a 72-hour constant rate discharge test. This test was carried out from the 27th to 30th November 2024, in Well 2. Based on the results of the step test, an abstraction rate of ca. 1.0m³/hr was used for the constant rate test ('CRT'); however; this varied between 0.6m³/hr to 2.4m³/hr throughout the test. For the data analysis and as per instruction from the subcontractor, the flow rate was averaged at 15-minute intervals which ranged between 0.8m³/hr to 1.6m³/hr and had an overall average flow rate of ca. 1.0m³/hr throughout the test.

During the CRT, water levels appeared to stabilise after ca. 16.5hrs (1,000 minutes) with a drawdown of ca. 13m. However, at ca. 47.5hrs (2,800 minutes) and again at ca. 59.5hrs (3,550 mins) the drawdown suddenly increased by ca. 2m. The flow rate remained relatively constant and so the sudden drop in water level cannot be contributed to an increase in flow rate. It is assumed that a fracture or other water strike was dewatered during the duration of the pump test and that the water levels dropped after this fracture became dry. However, this is an assumption without a borehole log or camera survey available to confirm the location of fractures within the borehole.

Water levels did not stabilise during the 72-hr CRT, but did remain around the 17m drawdown level. Results of this 72-hr CRT are presented in the graph shown in Figure 8-7 below.

Figure 8-7: 72-hr Constant Rate Test Results



Based solely on the results of the step test and 72-hr constant rate test, it is concluded that a discharge rate of ca. 1m^3/hr is achievable from Well 2. This abstraction rate is considered very low, and it was noted that this pumping test was carried out during the wintertime when groundwater levels have been replenished, and the water table is high. Hence, it is unknown if this yield would be achievable during the summertime.

8.3.2.2 Groundwater Monitoring

No groundwater monitoring has been completed at the site.

8.3.3 Groundwater Body (GWB) Status

The EPA mapping places the Site within the GWB of Ballyglass (EU code: IE_SE_G_011). The Ballyglass GWB has a total area of 1,397km^2 (139,700ha) [89]. This 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, which is the most recent WFD dataset available at the time of writing this report.

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 situated near several surface waterbodies, with the Carrigower River located approximately 40 meters northeast of the site boundary. Additionally, Brown's Beck (Brook) River lies about 50 meters northeast, the Winetavern River is 1.5 km southwest, and the Slaney River is approximately 1.6 km south of the site (refer to Figure 8-8).

Under the WFD, these waterbodies are categorized as follows:

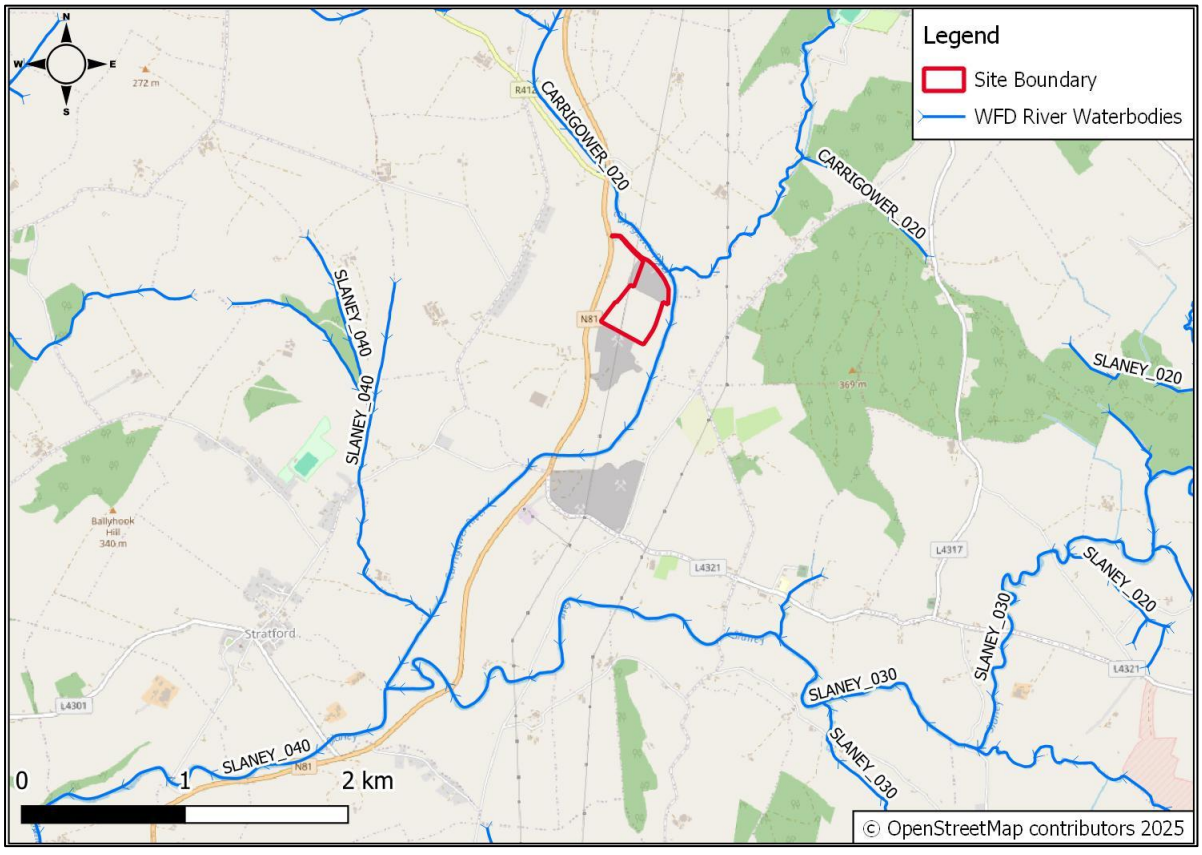
- Carrigower_020 Waterbody (EU code: IE_SE_12C060600)
    - Includes the Carrigower River and ca. 1.97km of the Brown's Beck Brook before it enters the Carrigower River.

- Classified as "Good" quality.
- Considered "Not at Risk" of failing to meet WFD objectives.
- Ecological Status: Moderate
- Physico-Chemical Status: Good
- Morphological Status: High

- Slaney_040 Waterbody (EU code: IE_SE_12S020600)
  - Encompasses the Winetavern River, the southern section of the Carrigower River, and the Slaney River downstream of the Carrigower River.
  - Classified as "High" quality.
  - Also considered "Not at Risk" of failing to meet WFD objectives.
  - Ecological Status: Good
  - Physico-Chemical Status: High
  - Morphological Status: High

There are no lake or canal surface waterbodies within 2km of the Site.

Figure 8-8: Surface Waterbodies



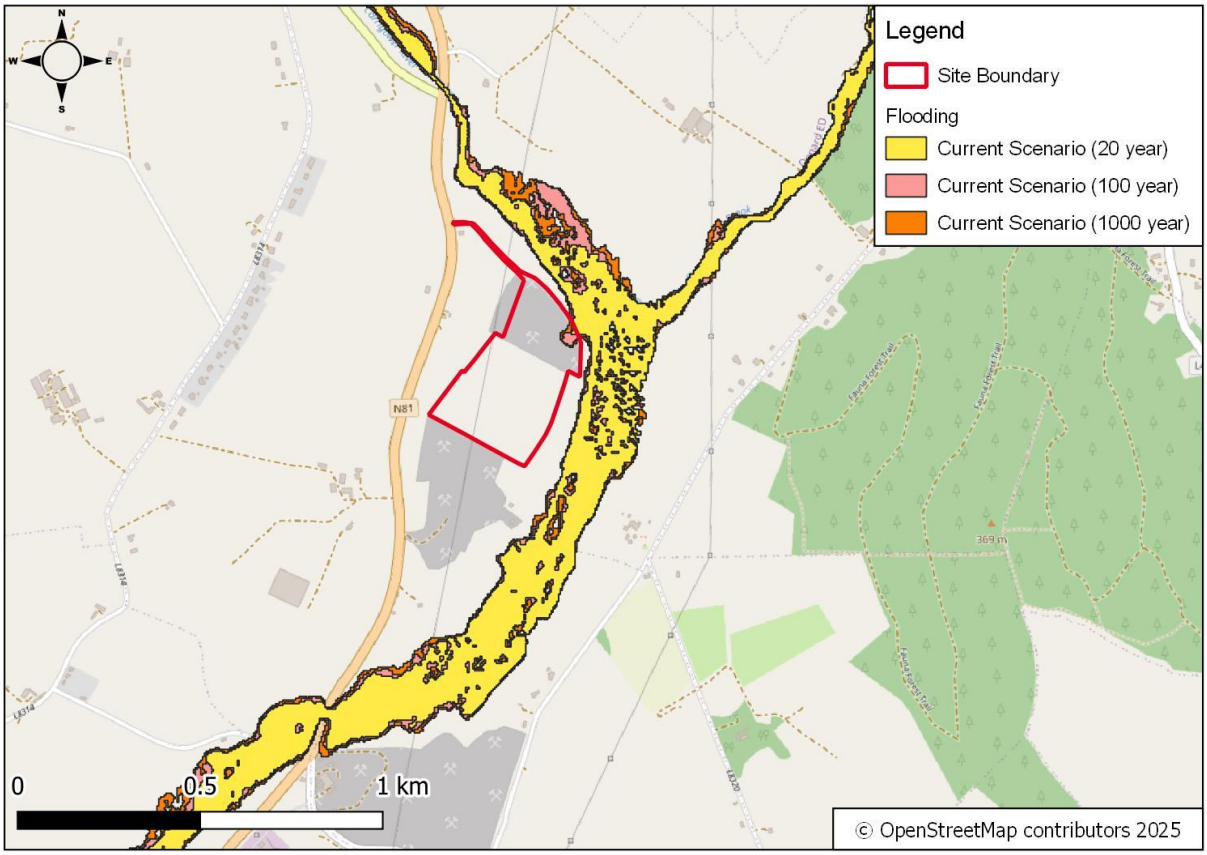
8.3.5 Flood Risk Assessment

The OPW's Catchment Flood Risk Assessment and Management ('CFRAM') maps [91], 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.

The lands to the east of the site fall within a Drainage District, meaning they were historically drained to improve agricultural productivity. The nearest recurring flood event has been identified approximately 0.85 km southwest of the site, associated with the Little Slaney watercourse, where flooding occurs on both sides of the N81 road. Additionally, the nearest recorded single flood event was documented around 2.38 km northeast of the site in Ennard Village, where three to four houses experienced flooding. Remedial works were undertaken in 2004, successfully resolving the issue.

Indicative flood mapping shows that the Carrigower watercourse, which runs near the eastern boundary of the site, has modelled flood extents that reach up to the eastern site boundary and include a small portion of the northeastern section of the site, which has a low potential of flooding (refer to Figure 8-9).

Figure 8-9: Indicative Flood Mapping



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 adjacent to the Site's undeveloped eastern boundary and permitted waste facilities northern boundary. However, a portion of the SAC is also located within the eastern boundary of the permitted waste facility section of the Site. The second SAC is the Wicklow Mountains SAC, located ca. 4.8km northeast of the Site. Additionally, the protected Salmonid waters of the River Slaney are connected to the Carrigower_020 waterbody, ca. 2.6km 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

A toilet and sink already exist in the on-site office as part of on-site hygiene facilities. Wastewater produced by these facilities is retained on-site. Appropriately qualified waste contractors is empty this system on an as-needed basis. 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

Reduction in the protection of the bedrock aquifer and groundwater body:

The removal of overburden and soils during the Proposed Development to extract aggregate will result in an increase in the groundwater vulnerability classification of the underlying bedrock aquifer. The site is currently classified as having the High groundwater vulnerability, which will be elevated to the highest category (Rock at/ near surface or Karst) due to bedrock exposure during quarry operations. The bedrock aquifer underlying the Site is classified as a locally important aquifer and hence is considered to be of medium importance. An increase in the groundwater vulnerability classification will be localised and limited to the total extractable area (7.75ha) which represents approximately 0.0055% of the total area of the Ballyglass GWB (139,700ha). In the absence of mitigation, the magnitude of the impact is considered to be small adverse which will result in a negative, slight effect on the protection of the bedrock aquifer and GWB.

Contamination Risk:

The use of heavy machinery during the construction and operational phase of the Proposed Development will introduce a risk of fuel or hydrocarbon spills. This may threaten the quality of groundwater in the underlying bedrock aquifer should such spills be allowed to infiltrate to ground in the absence of mitigation measures.

Additionally, a settlement pond will be constructed on-site as part of the closed loop design to use recycled water for plant operations. Sediment laden water and water across the Site will be collected and diverted to the settlement pond. Suspended solids will accumulate and settle within this pond over a 24-hour period, which will allow clean water to be recycled and reused for plant operations. There is a risk that hydrocarbons will enter this recycled water system through spills, overland runoff and/or from hydrocarbons used in plant operations.

The risk of such an event occurring is low and the volume of hydrocarbons which may enter the groundwater within the bedrock aquifer is also low. Therefore, should this occur, the magnitude of the impact would be considered to be small adverse which will result in a negative, slight effect on the bedrock aquifer.

Water Framework Directive Impact(s) relating to Groundwater:

Groundwater abstraction on-site will be limited to a single well, intended to supply water for welfare facilities, wheel washing during extended dry periods, and to top up the settlement pond at a rate of ca. 1m^3/hr. This level of abstraction has been determined as the sustainable pumping rate for the bedrock aquifer at this location and hence is not expected to impose any significant pressure on groundwater resources. Therefore, there will be no negative effects on the quantity of groundwater within the area of the Site.

At a broader scale, the Ballyglass GWB currently holds a "Good" water quality status under the Water Framework Directive, though it is considered "At Risk" of not achieving the aims of the WFD (i.e. to achieve and maintain at least 'good' water quality status). The predominant risk to groundwater quality as a result of the Proposed Development is the infiltration of hydrocarbons into the bedrock aquifer. As stated above under contamination risks, should this occur without mitigation measures it will result in a negative, slight effect on the GWB.

8.4.2 Surface Water

Water Framework Directive Impact(s) relating to Surface Water:

There is no hydrological connection between Carrigower_020, the nearest surface waterbody to the Site, or between any other surface waterbody and the Site. Hence, based on the source-pathway-receptor model, there is no risk of impacts or lasting effects on the surface water environment.

The settlement pond to be built on-site will be a re-circulating system with no designed discharge off-site. Infrequently, the pond may overflow, in which case water will percolate into the ground but will not reach Carrigower_020 or any other surface water body. Therefore, there will be no effects on surface water bodies from the settlement pond.

Additionally, a comprehensive incident response procedure will be in place to enable the swift containment and mitigation of any spill events. All contaminated materials will be appropriately managed and disposed of via a fully licensed waste contractor, thereby reducing the potential for further contamination. Moreover, on-site surface water will naturally drain toward the settlement pond, which acts as a control point for capturing and containing any spilled material. If necessary, the pond can be pumped out, cleaned, and restored to maintain its effectiveness. Additional mitigation measures will also be implemented to limit the magnitude of any potential impacts arising from unplanned discharges.

8.4.3 Settlement Pond

The proposed on-site settlement pond will be constructed in the northeast section of the Proposed Development (refer to Figure 3-8). It is proposed to be designed as a 60m by 13m to a 3m depth excavation, yielding a total volume of 2,340m³. The primary purpose is a closed loop design is to provide a 24-hour hydraulic retention time for recycled water used in the wash plant, ensuring the effective settling of suspended solids via a three-chamber configuration. In addition, the design integrates supplementary water sources, including a continuous recharge of 1 m³/hr from Well 2 (approximately 24m³/day) and rainwater collection, to maintain consistent pond levels and accommodate fluctuations in inflow.

The pond will be partitioned into three equal chambers along its 60m length, with each chamber measuring 20m by 13m to a 3m depth, resulting in a volume of 780m³ per chamber. The design "pushes" a working volume of approximately 720m³/day through the chambers in a plug flow manner, providing roughly 8 hours of retention time in each chamber. Although only a portion of the total volume is actively circulated, the full volume acts as a reserve to buffer variations and support extended settling.

The inlet system in Chamber 1 is designed to handle combined inflows from the recycled water return, well recharge, and rainwater inputs. A diffuser or forebay equipped with energy-dissipating baffles slows the incoming water, minimising turbulence and preventing the re-suspension of settled particles. Inter-chamber baffles or low-level weirs between Chambers 1, 2, and 3 promote a plug flow condition by preventing short-circuiting and ensuring that water remains in each chamber for roughly 8 hours. In Chamber 3, a surface withdrawal outlet, using a riser or siphon with screens, extracts clarified water from the top layer while leaving settled solids behind. This outlet is carefully controlled to maintain the necessary active exchange rate.

Operationally, the design offers several benefits. The 24-hour retention time and three-chamber layout ensure that suspended solids have sufficient time to settle, enhancing water quality for reuse in the wash plant. The reserve volume provides flexibility and redundancy to handle fluctuations from daily flow variations, rain events, and process changes.

As stated above, there are no impacts or lasting effects expected on the surface water environment or the groundwater environment as a result of the settlement pond.

8.5 Proposed Mitigation Measures

During construction, operational and restoration works ofon 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) [75], 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 on a concrete plinth in the Proposed Development adjacent to the generator shed. This plinth flows into an oil/water separator before reaching the settlement pond;
- 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 will be 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; and
- If groundwater is encountered during excavation activities, construction will be stopped until appropriate measures are implemented to assess, manage, and mitigate any potential impacts. This may include dewatering, groundwater diversion, or additional engineering controls to ensure compliance with environmental regulations and prevent any adverse effects on the surrounding hydrology. All necessary actions will be taken in accordance with best practice guidelines and regulatory requirements.

The settlement pond will be inspected daily for the presence of hydrocarbons:

- If hydrocarbon contamination is detected, any pumping of water to the wash plant from the pond 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;

- 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; and,
- The settlement pond will be inspected visually prior to pumping.

8.5.1 Water Framework Directive

There are no predicted effects on the surface waterbodies within the area of the Proposed Development.

The predicted effects on the Ballyglass GWB are considered to be negative and slight in the absence of mitigation measures. However, with the implementation of robust mitigation measures listed above, it can be concluded that the Construction and Operational stages of the Proposed Development will not jeopardise the achievement of:

- good quality status;
- good chemical status; or,
- good ecological potential

for any directly or indirectly connected waterbody.

Additionally, the Proposed Development will not:

- Contribute to the risk of any directly or indirectly connected waterbody from failing to achieve "Good" status within the next cycle of the Water Framework Directive monitoring; or
- Degrade the ecological quality of the protected sites associated with connected waterbodies nor jeopardise the goals and/ or targets set out for these protected sites.

Therefore, the Proposed Development will not compromise the objectives and requirements of the WFD within the local area and within the river basin district or the ability of any waters to meet the objectives of the WFD and transposing legislation.

8.6 Cumulative and In-combination Effects

There are several quarry sites located in the vicinity of the Proposed Development (refer to Section 5.3.3.3), four of which—QY26, QY15/16, Stephenson Sand and Gravel Pit, and O'Halloran Pit—are situated approximately downgradient of the inferred groundwater flow direction. All of these quarries are currently non-operational. Specifically, QY15/16 has undergone restoration as a soil recovery facility, while Stephenson Sand and Gravel Pit and O'Halloran Pit are presently being restored through the importation of inert materials. QY26, which had previously been used as an illegal landfill, is now undergoing remediation and restoration works. Although the potential for contaminant leaching from the unauthorised landfill (PR052224) could pose a concern for local groundwater quality, it is important to note The EPA granted permission under Waste License No. W0204-01 for the cleanup of this unauthorized landfill [90].

Cumulative effects from surrounding restored quarry sites are anticipated to be negligible and not significant.

Given that these sites are no longer functioning as active quarries and are either restored or in the process of restoration, any cumulative effects related to quarrying operations are considered to be imperceptible. With the implementation of the mitigation measures the Proposed Development will not result in any significant effects on the surface water or groundwater environments.

Therefore, it is considered that the cumulative effects of Proposed Development will be not significant.

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. However, no likely significant effects were identified;
- Chapter 6 (Biodiversity) - Potential impacts on hydrology can also impact on ecological conditions and ecologically designated sites. However, no likely significant effects were identified;
- Chapter 7 (Land Use, Soils and Geology) - Impact on soils/bedrock can result in related impacts on surface water and groundwater. However, no likely significant effects were identified; and,
- Chapter 10 – Climate Change: Climate change could lead to intense rainfall which could contribute to flooding. The potential effects associated with climate change on water have been fully considered in Chapter 10. However, no likely significant effects were identified.

8.8 Indirect Effects

In addition to the direct effects assessed, potential indirect effects of the Proposed Development have been considered. While the removal of overburden may lead to minor, localised changes in groundwater recharge or flow paths, these are expected to be negligible. The site is underlain by well-characterised and relatively uniform geology, and no direct hydrological connections to nearby surface water features have been identified. The potential for long-term changes to baseflow in springs, seeps, or shallow discharge areas is considered highly unlikely. Similarly, any temporary loss of vegetative cover may slightly increase erosion risk during intense rainfall; however, the risk of sediment transport beyond the site is low due to the presence of control measures such as settlement ponds and vegetated buffers.

Overall, no significant indirect effects are predicted, and the proposed mitigation and monitoring measures will ensure continued protection of the surrounding environment.

8.9 Residual Effects

Following the full implementation of the proposed mitigation measures, the effect of a potential hydrocarbon spillage is considered not significant. The spill response protocols are deemed sufficient to limit the magnitude of any such event to a slight to moderate negative impact on both surface water and groundwater receptors.

Post-mitigation, the effects on local groundwater quality are considered not likely and not significant. These effects can be described in detail as negative but imperceptible, particularly in the context of the Ballyglass GWB. No direct hydrological connections have been identified between the Site and the Carrigower_020 waterbody or any other downstream surface water bodies. As such, it is considered that the effect on surface water bodies is not significant.

Accordingly, the Proposed Development will not cause a deterioration in the status of any surface waterbody or groundwater body assessed. The development will not hinder surface waterbodies from achieving "Good" chemical or ecological status nor prevent the Slaney_040 waterbody from attaining its designated "High" status objective. Similarly, the Proposed Development will not impede groundwater bodies from achieving or maintaining "Good" chemical or quantitative status.

Therefore, it is concluded that the Proposed Development will not compromise the objectives or requirements of the WFD either within the local area or across the broader river basin district and any residual effects will be not significant.

8.10 Monitoring

As part of the mitigation measures to ensure ongoing protection of groundwater quality, a structured groundwater monitoring programme will be implemented for the duration of the quarry operations. Quarterly groundwater monitoring will be conducted from available upgradient and downgradient monitoring wells, allowing for early detection of any potential changes in groundwater quality arising from site activities. The monitoring will include analysis of key parameters relevant to quarry operations, including but not limited to:

- pH;
- Electrical conductivity;
- Suspended solids;
- Hydrocarbons (including Total Petroleum Hydrocarbons);
- Nutrients (e.g., nitrate, ammonium); and,
- Metals (where applicable).

All monitoring results will be assessed against the most recent EU Groundwater Quality Standards and Threshold Values, as defined under the Groundwater Directive (2006/118/EC) and relevant national transposing regulations. In the event that any exceedances of regulatory limits or threshold values are identified, the results will be reported to the EPA, as well as WCC and an appropriate investigation and response protocol will be activated.

The collected data will be reviewed annually and compiled into a comprehensive Groundwater Monitoring Report, including trend analysis, regulatory compliance assessment, and recommendations for corrective actions if required. This monitoring programme will ensure continuous verification of mitigation effectiveness and support adaptive management throughout the quarry's operational life.

8.11 Reinstatement

Upon completion of extraction activities, the site will be restored in accordance with the comprehensive Restoration Plan (refer to Section 3.4.3), which outlines measures to return the quarry to a stable and environmentally beneficial condition. The existing settlement pond will be retained and enhanced as a permanent wetland habitat to support biodiversity and natural water filtration. Reapplication of topsoil across the worked areas will restore the soil's natural infiltration capacity, supporting vegetation growth and helping to maintain groundwater recharge while minimising surface runoff. Final landform regrading, planting of native species, and habitat connectivity measures will be implemented to promote long-term ecological resilience and integration with the surrounding landscape.

8.12 Difficulties Encountered

There were no difficulties encountered when developing this chapter.

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 evaluate the baseline conditions and in the assessment of potential impacts on the receiving environment:

- Department of Environment Heritage and Local Government ('DEHLG') – Quarries and Ancillary Activities: Guidelines for Planning Authorities, 2004 [74];
- Institute of Air Quality Management ('IAQM')- Guidance on the Assessment of Mineral Dust Impacts for Planning [92], version 1.1, 2016;
- Environmental Management in the Extractive Industry (Non-Scheduled Minerals), 2006 [76];
- Air Quality in Ireland 2022 – Indicators of Air Quality [93];
- Air Quality in Ireland 2023- Indicators of Air Quality [94];
- Transport Infrastructure of Ireland – Air Quality Assessments for specified infrastructure projects [95]; and,
- Technical Instructions on Air Quality Control – TA Luft [96].

The methodology proposed by the UK Institute of Air Quality Management ('IAQM') in their Guidance on Mineral Dust [92] was used to complete the disamenity dust risk assessment; see Appendix 9-1 for more information.

This chapter assesses the effect of the Proposed Development on sensitive receptors in relation to human health, through the methodology presented in IAQM [92] guidance document and the Clean Air for Europe directives, and in relation to dust nuisance, through the methodology outlined in the TA Luft [96], EPA [75] and DEHLG [74].

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 [97]. The report aims to outline the 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}[8] 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 [97] total.

9.2.1.2 Wicklow County Development Plan 2022-2028

The CDP details various aims and objectives relating to Air Quality relevant to the Proposed Development [6].

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.

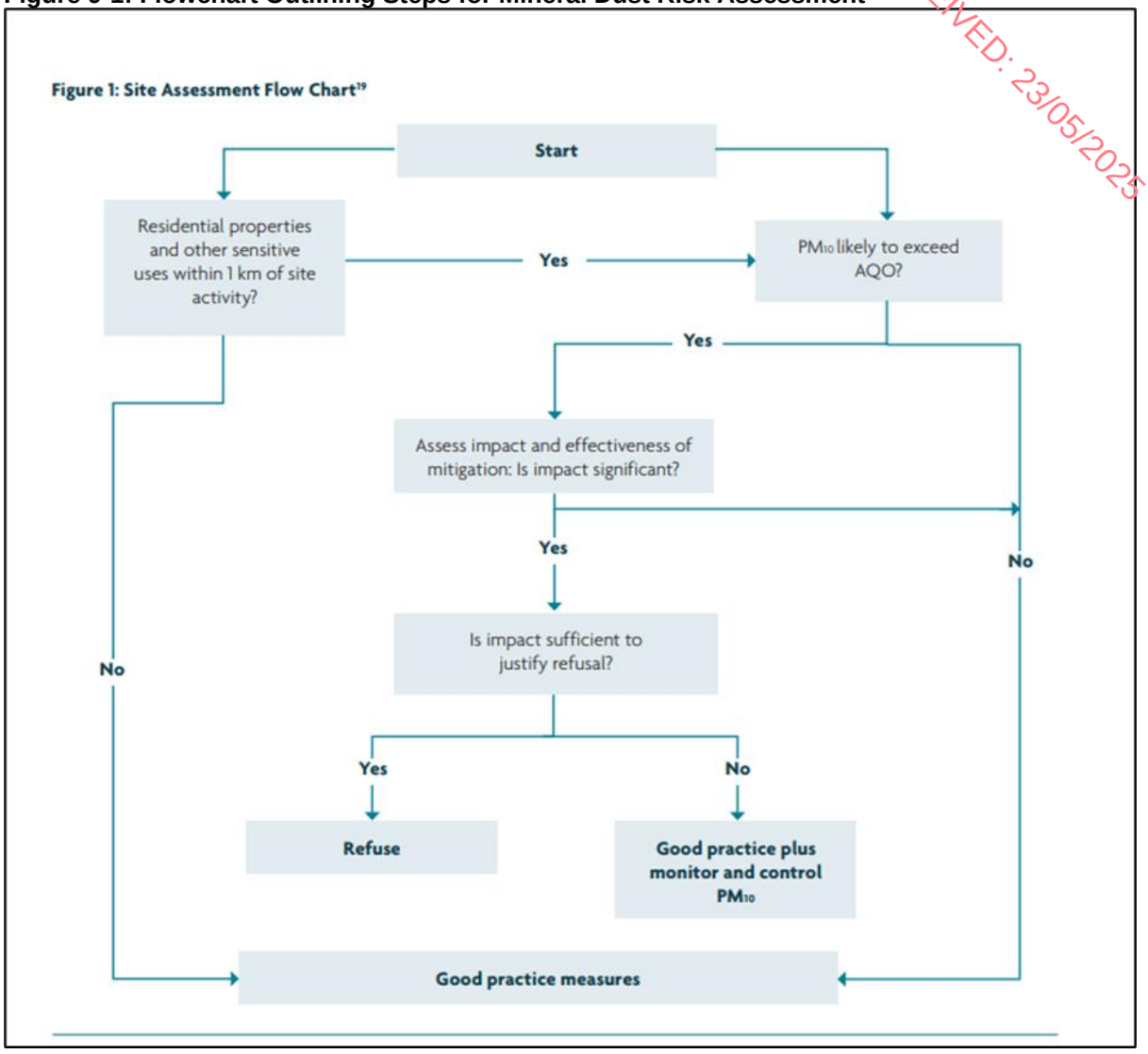
The definition of minerals in this chapter is taken from Statutory Instruments ('S.I') No. 600 of the Planning and Development Regulations (as amended);

> *"All minerals and substances in or under the land of a kind ordinarily worked by underground or by surface working for the removal but does not include turf."*

This Mineral Dust Risk Assessment will consider both Suspended Dust and Disamenity Dust. Dust arising from the quarry can reduce amenity in the local community due to visible dust plumes and dust soiling [92]. The generally coarser dust that leads to these effects may, therefore, be referred to as 'disamenity dust'. The smaller dust particles can remain airborne longer, potentially increasing local ambient concentrations of suspended particulate matter (e.g. PM10 and to a lesser extent PM2.5), which is associated with a range of health effects [92]. This is commonly referred to as 'Suspended Dust'.

[8] PM10 refers to particulate matter with a diameter of 10 micrometers or less

Figure 9-1: Flowchart Outlining Steps for Mineral Dust Risk Assessment



9.2.3 Air Quality Standards

Assessment of the significance of emissions to air is made with reference to limit values established through 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 Standard ('AQS') for PM_{10} set out in S.I. No. 180 of 2011 is shown in Table 9-1. The AQS are based on the effects of pollutants on human health, although other factors, such as effects on vegetation and ecosystems, are often considered.

Table 9-1:Air Quality Standards ('AQS') Limit Values

Pollutant	Objective			
	Concentration	**Maximum No. of Exceedances permitted**	**Exceedance Expressed as Percentile**	**Measured as**
Particles (PM_{10})	50µg/m^3	35 times in a year	90.40th percentile	24-hour mean
	40µg/m^3	None	-	Annual mean

The above AQS limit values are applicable to the air quality in the locality of the Proposed Development.

9.2.4 Dust Deposition Limits

The EPA's Guidelines for Extractive Industries and the DEHLG, Quarries and Ancillary Activities [74], indicates that quarries, by their nature, generate dust, with the main impact being disamenity due to dust deposition. The Proposed Development and associated activities may give rise to dust. As such, it has been determined based on the above guidelines and the MOR Environmental assessor that dust deposition limits that are generally applied to quarry operations are relevant to the Proposed Development.

However, there are currently no Irish statutory limits relating specifically to dust deposition thresholds for inert dust. The Bergerhoff Method specified in the Technical Instructions on Air Quality Control (TA Luft) Air Quality Standards is typically used for monitoring of dust deposition in Ireland [98]. Also, the TA Luft dust deposition limit value of 350mg/m^2/day (when averaged over a 30-day period) is typically set as a limit along the boundary of quarries and infill developments. Historic Bergerhoff dust monitoring was undertaken at the Site between 2023 and 2024, which has been considered as part of this assessment.

9.3 Receiving Environment

9.3.1 Baseline Bergerhoff Dust Monitoring

For the period 3rd September 2023 to the 3rd January 2024 (three sampling events), Bergerhoff monitoring was conducted at four locations to establish baseline conditions at 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.

Figure 9-2: Historic Dust Monitoring Locations

The results of the Bergerhoff dust monitoring are presented in Table 9-2 below.

Table 9-2: Bergerhoff Dust Monitoring Results for 2023-2024

Monitoring Locations	Monitoring Event 1 03/10/2023-02/11/2023	Monitoring Event 2 02/11/2023-30/11/2023	Monitoring Event 3 30/11/2023-03/1/2024	TA Luft Limit mg/m²/day
DM1	55	149	146	350
DM2	124	5	75	350
DM3	73	24	123	350
DM4	**	**	**	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 and could therefore not be analysed.

Over the three-baseline monitoring periods, 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.

9.3.2 EPA Zones for Ambient Air Quality Monitoring

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 (Key Indicators of Ambient Air Quality) – Annual Report 2023 [99], the most recent 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)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.

The Proposed Development is located in Zone D. Table 9-3 below shows the baseline air quality data in a number of Zone D regions.

9.3.3 Background Concentration of Relevant Pollutants

The AG4 Guidance [100] document requires that background concentrations available from the representative monitoring stations operated by the EPA are used for this risk assessment. The selected background concentrations are based on the average of the appropriate zonal concentrations. In this case, the Site is situated in Zone D (Rural Ireland).

AG4 recommends that average of 2 to 3 years of data is used. Table 9-3 shows the baseline air quality data for Zone D for PM_{10} and $PM_{2.5}$ taken from 2022 and 2023 of the EPA Air Quality reports [93], [94] which is the most recent dataset available at the time of writing.

Table 9-3: PM_{10} from Zone D EPA monitoring stations (2022-2023)

Monitoring Station	PM_{10} Annual Mean (µg/m³)	
	2022	2023
Askeaton	9.4	8.4
Birr	14.5	13.1
Carrick-on-Shannon	-	8.9
Castlebar	11.2	9.9
Cavan	11.0	10.0
Claremorris	7.75	8.1
Cobh Carrignafoy	13.2	11.8
Cobh Cork Harbour	14.4	11.4
Edenderry	17.7	16.3
Enniscorthy	15.0	13.3
Kilkitt	8.5	7.1
Killarney, Co. Kerry	9.1	8.9

Monitoring Station	PM_{10} Annual Mean (µg/m³)	
	2022	2023
Longford	16.0	13.1
Macroom	16.1	11.3
Malin Head	-	12.8
Mallow	13.5	10.5
Roscommon Town	11.2	9.7
Tipperary Town	13.9	10.8
Annual Average	12.8	10.9
Average Zone D	**11.8µg/m³**	

The average background annual mean PM_{10} value for Zone D for the period 2022-2023 was 11.8µg/m³. 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 13.3µg/m³ and 15µg/m³ for the period 2022-2023. The EPA's Guidance on Air Dispersion Modelling (AG4) requires a minimum of two consecutive years of background ambient air quality data be [101] given the proximity of the Enniscorthy monitoring station to the Site, an average of the past two years of PM_{10} concentrations (14.2 µg/m³) was adopted as appropriate ambient background concentrations for the risk assessment (section 9.4).

9.3.4 Other Sources of Emissions to Air in the vicinity of the Site

Notable sources of local emissions to air, in the vicinity of the Proposed Development, include:

- Traffic associated with roads including the N81, regional and local roads;
- Agricultural activities;
- Nearby developments of similar industry; 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') licensed facilities located less than 10km from the Proposed Development are outlined in Table 9-4 below.

Table 9-4: Existing IEL sites within 10km of 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. 7km Northwest

The IAQM Guidance on Mineral Dust states that likely impacts of PM_{10} or nuisance dust caused by quarry operations can be observed up to 250m away [92]. Taking this 250m distance as the outer limit for potential quarry-related effects on air quality, it's pertinent to note there are no IE licensed facilities within this radius of the Proposed Development. There are also no existing or proposed developments of a similar activity within 250m of the Site. The

closest proposed quarry development is ca. 450m to the east of the Proposed Development and is awaiting a decision on the planning application from WCC. Due to the distance between the Site and the aforementioned IEL facilities and industries of similar activity (existing and proposed), it is considered unlikely that a cumulative effect would exist between these facilities and the Proposed Development.

As outlined in section 1.1 and further discussed in section 3.2, the Site's northern portion was previously used for aggregate extraction and covers an area of ca. 4.3ha. After quarrying ceased, planning permission (Ref. No. 201117) was granted to restore 2.73ha of the quarry pit using imported inert soils and stone, while an additional 0.21ha was to be restored with Site-won materials.

The ongoing restoration programme of this quarry pit, adjacent to the Proposed Development, was authorised by the Environmental Section of WCC. This permit allowed for the importation of waste soils under Waste Facility Permit (WFP-WW-21-0067-01), was granted to Herbie Stephenson Ltd. on 24th August 2021, with an expiry date of 23rd August 2026. The Permit includes the importation of inert soils and stones at a rate of 23,000t per annum, with a cumulative tonnage of 115,000t. Given that these works are located within the Site boundary, they were considered in the Mineral Dust Risk Assessment together with the Proposed Development activities.

9.3.5 Identified Dust Sensitive Receptors

The Proposed Development activities traditionally associated with mineral extraction will occur for the Proposed Development, such as;

- Site preparation (working soil and overburden);
- Operational stage (Extraction / Processing);
- 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, May 2016 [92].

The IAQM Guidelines state that adverse impacts from sand and gravel quarries are uncommon beyond 250m and at distances greater than 400m from hard rock quarries. These distances are measured from the nearest dust-generating activities. As such, the following risk assessment included receptors within 250m of dust-generating activities (Figure 9-3 below).

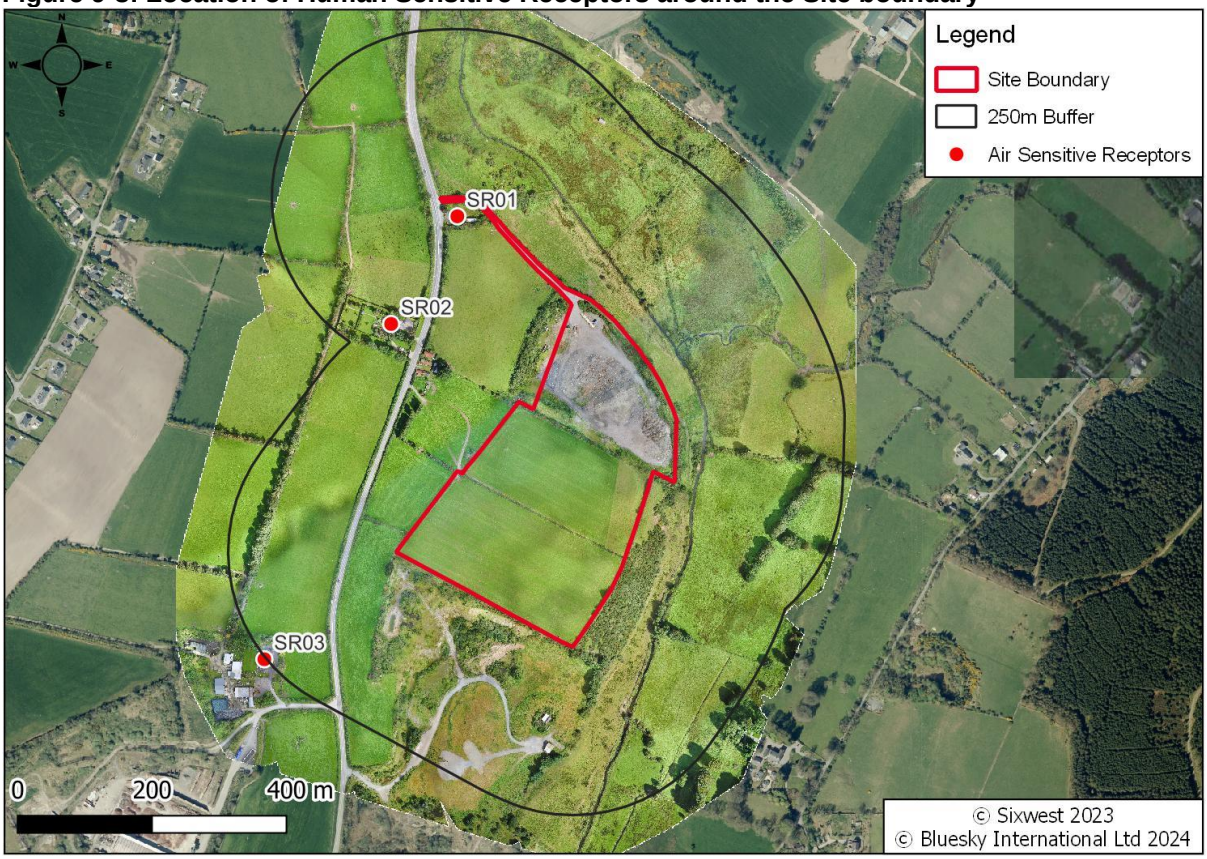
On-site dust-generating activities will primarily occur within the quarry void where the excavation will occur (unless otherwise specified). Three receptors were identified within 250m of dust-generating activities associated with the Proposed Development (SR01-SR03) (Table 9-5).

Table 9-5: Identification of Sensitive Receptors ('SRs')

ID	ITM (Easting, Northing)		Description of Sensitive Receptor	Distance/ Ordination from Emission Source (m)	Terrain between Site and Receptor
	E	N			
SR01	691181	696244	Residential dwelling located to the north of the Site.	ca.22m north	Terrain between the receptor and dust generating activities includes an agricultural field. Potential buffers within this

ID	ITM (Easting, Northing)		Description of Sensitive Receptor	Distance/ Ordination from Emission Source (m)	Terrain between Site and Receptor
	E	N			
					terrain include hedgerows around the periphery of the Site and hedgerow forming field boundaries.
SR02	691083	696084	Residential dwelling located to the west of the Site.	ca.194m west	Terrain between the receptor and dust generating activities includes an agricultural field and national road. Potential buffers within this terrain hedgerows around the periphery of the Site and hedgerow forming field boundaries.
SR03	690894	695586	Residential dwelling located to the south-west of the site.	ca.245m southwest	Terrain between the receptor and dust generating activities includes agricultural fields. Potential buffers within this terrain hedgerows around the periphery of the Site and hedgerow forming field boundaries.

Figure 9-3: Location of Human Sensitive Receptors around the Site boundary



9.3.6 Designated Ecological Receptors

The majority of the Site boundary is directly adjacent to the Slaney River Valley SAC (Natura 2000 Site). However, a portion of the Site boundary is partially located within this SAC site. Table 9-6 displays the location of the nearby ecological receptor.

Table 9-6: Location of Natura 2000 site

ID	Site Name	Site Code	Distance (km) & Direction
ER01	Slaney River Valley SAC	000781	Partially within - East

The IAQM Guidelines [92] also requires that ecological receptors within a 250m radius of the Proposed Development are included in a mineral dust risk assessment. As such, three locations along this SAC have been included in the risk assessment. Chapter 6 (Biodiversity) provides further information on this site. Figure 9-4 and Table 9-7 show the ecological receptors within the SAC that are included in the Mineral Dust Risk Assessment relative to the Proposed Development. Three locations were chosen to ensure a robust assessment was carried out of any potential effects of disamenity dust on the SAC.

Figure 9-4: Location of ecological receptors relative to the Proposed Development.

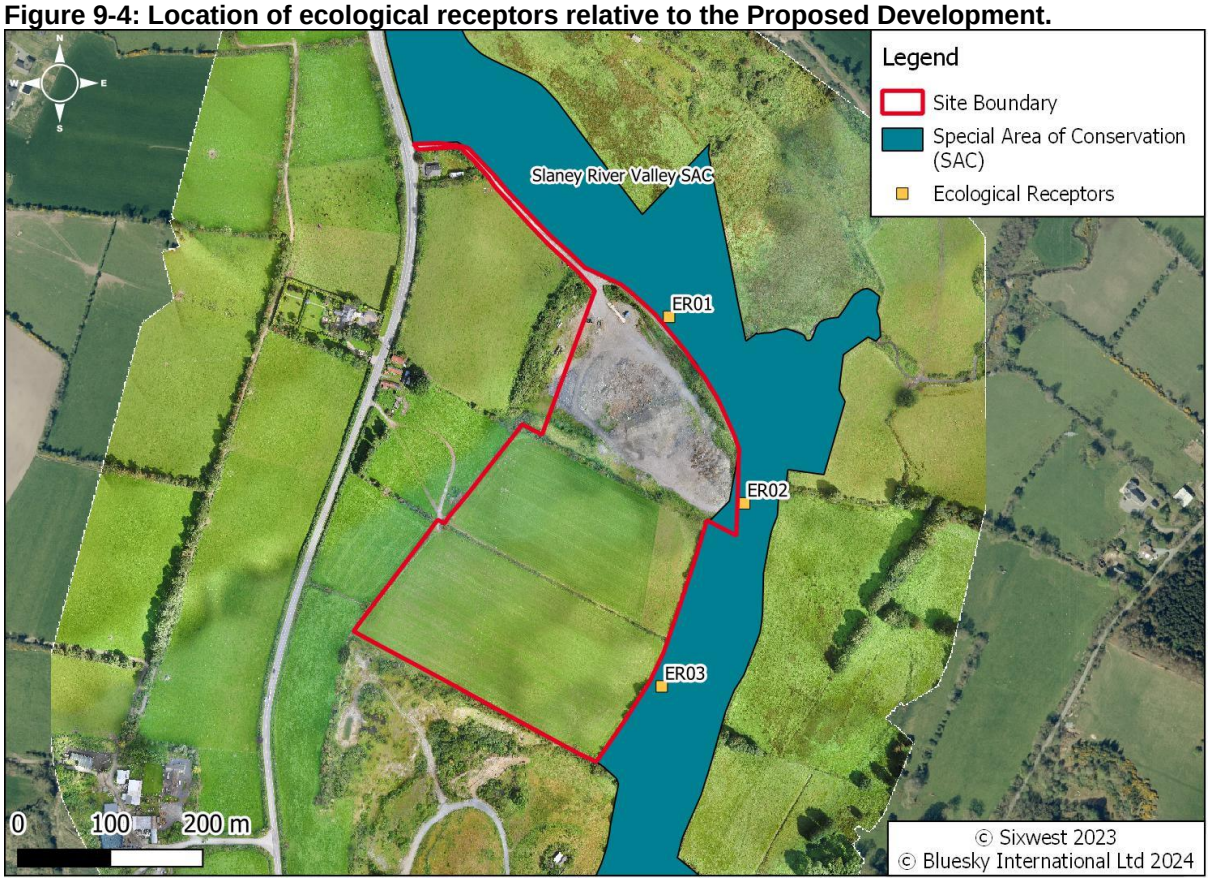


Table 9-7: Identification of Ecological Receptors ('ERs')

ID	ITM (Easting, Northing)		Description of Sensitive Receptor	Distance/ Ordination from Emission Source (m)	Terrain between Site and Receptor
	E	N			
ER01	691431	696084	SAC ecological receptor proxy location.	ca.5m northeast	Terrain between the receptor and dust generating activities includes a hedgerow providing a potential buffer.
ER02	691512	695883	SAC ecological receptor proxy location.	ca.5m east	Terrain between the receptor and dust generating activities includes a hedgerow providing a potential buffer.
ER03	691423	695685	SAC ecological receptor proxy location.	ca.5m south east	Terrain between the receptor and dust generating activities includes a hedgerow providing a potential buffer.

9.3.7 Weather Conditions

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 generation typically occur during dry spells associated with medium to strong breezes (>5.5m/s). A wind rose was prepared for a five-year period (2020 to 2024) to determine the potential influence of wind direction and wind speed 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 southwest of the Site. The weather conditions at this met station are broadly representative of the weather conditions at the Site.

A wind rose utilising five years of data has indicated that the prevailing wind blows primarily from a southerly direction (Refer to Figure 9-5 below), followed by southeasterly and northeasterly directions.

Figure 9-5: Wind Rose Oak Park, Co. Carlow (2020-2024)

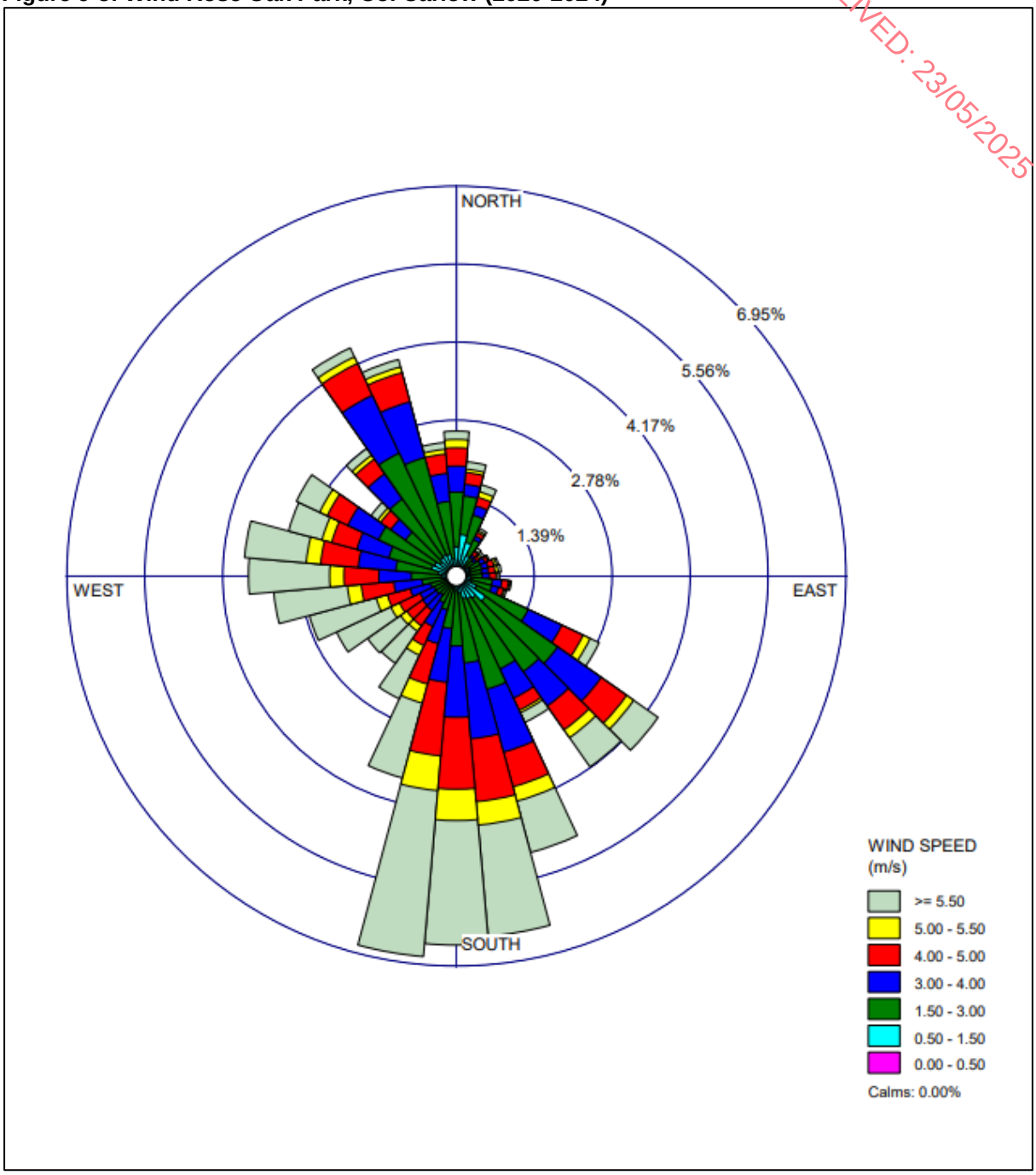


Table 9-8 below summarises the important meteorological variables recorded at the Oak Park station between 2020-2024.

Table 9-8: Summary of Meteorological Data at Oak Park, Co. Carlow 2020-2024

Year	Total Precipitation (mm)	Average Windspeed (m/s)
2020	910.1	4.15
2021	784.8	3.58

Year	Total Precipitation (mm)	Average Windspeed (m/s)
2022	840.1	3.75
2023	936.9	3.83
2024	777.5	4.03
Average 2020-2024	**849.9**	**3.84**

The average windspeed data at the Oak Park station between 2020-2024 was 3.84m/s. The prevailing wind directions were from the south (S) – southwest (SW). This would indicate that receptors in the opposite direction would be most sensitive to dust generated at the Site.

9.4 Characteristics and Potential Effects of the Proposed Development

The main potential effects on air quality from the Proposed Development are dust emissions, which can have the following impacts:

- Disamenity, due to dust deposited on surfaces, which leads to 'soiling'; and,
- Increased concentrations of dust particles suspended in the air (PM_{10}).

Assessment of disamenity dust and suspended dust particles (PM_{10}) is detailed below. With regard to disamenity dust, two stages of the Proposed Development were considered:

- Construction Stage (Site Preparation) – Operational Stage (15-16 years); and,
- Site Restoration Stage – Site Closure (2 years).

9.4.1 Construction Stage - Operational Stage

As per the description of the Proposed Development presented in Chapter 3, the Construction Stage and Operational Stage will be interlinked, progressing simultaneously. Planning permission is being sought for 20 years. The Construction Stage and Operational Stage will be considered together rather than separately and are expected to take 15-16 years, followed by a further two years for the restoration stage to rehabilitate the extended area after excavations are completed.

The Construction Stage and Operational Stage will present the greatest potential for dust generation of the project. These stages will comprise the extraction of sand and gravel from the quarry face and the processing of aggregates.

The Proposed Development will involve the stripping of the existing topsoil at the Site to access the underlying sand and gravel. The Proposed Development will seek to extract sand and gravel from the existing levels down to 143mAOD, featuring benches at ground level, ca. 162mAOD and 153mAOD. The proposed depth of the Proposed Development will provide some level of screening from wind for the majority of the works. This will reduce the potential extent of dust dispersion caused by the extraction process. An excavator will remove the sand and gravel aggregates, which will then be moved to the proposed screening plant within the quarry pit floor area for further processing. Once processing has been completed, the aggregates will be temporarily stockpiled before being transported to the market via HGVs. HGVs will travel down the access route to and from the Site. Details regarding this Stage are outlined in section 3.2 of this EIAR.

The former sand and gravel pit in the northern portion of the Site includes one wheel wash before the internal local access road commences, which connects the Site with the N81 (see section 3.5 for additional details on existing infrastructure at the Site). HGVs will use the

existing haul routes that consist of loose stone and gravel before passing through the wheel wash and exiting the Site via the internal local access road onto the N81. As such, dust generated on the haul routes will be minimal.

The movement of HGVs and the operation of onsite plant have the potential to cause impacts on local air quality, through the release of NO_2 to the atmosphere.

Potential traffic emissions were screened in accordance with the thresholds set out by the TII Technical Guidance on Air Quality Assessments [95]. A detailed assessment is required when:

- Heavy duty vehicles ('HDVs') greater than 3.5 tonnes, including buses and coaches, flows will change by 200 Annual Average Daily Traffic ('AADT') or more.

There will be 41 HGVs accessing the Site per day during the Proposed Development. There will be an additional five employee vehicles accessing the Site relating to employee transport and an additional two miscellaneous trucks / Large Goods Vehicles ('LGVs') associated with deliveries. Therefore, the AADT will be a total of 96 movements, and below the threshold set for the requirement of a traffic emissions assessment. As such, an Air Quality Assessment of Traffic Emissions is not required for this Proposed Development, and this assessment has been screened out.

The IAQM Guidance on Demolition and Construction [102], exhaust emissions from onsite plant and onsite traffic are unlikely to have a significant effect on local air quality. As such, assessing the potential effects on air quality as a result of plant and traffic onsite was not required and was therefore screened out.

9.4.2 Site Restoration Stage – Site Closure

Following the completion of extraction activities, the Site will undergo a comprehensive reinstatement and restoration process designed to return the land to a productive and environmentally sustainable condition. The strategy was developed in accordance with best practice guidance and is intended to restore soil functionality and ensure long-term integration of the Site with the surrounding landscape.

The restoration stage will be carried out in line with a dedicated Restoration Plan, which has been prepared by MOR Environmental and accompanies this planning application (refer to Appendix 6-1). The restoration will comprise the placement of the topsoil and subsequent seeding to establish a habitat similar to that which existed prior to the historic quarrying.

This stage will last up to two years, and potential for dust emissions will be associated with the replacement of the topsoil at the Site.

9.5 Dust Risk Assessment

9.5.1 Suspended Dust

The IAQM Guidance on Mineral Dust states [92]:

> *"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 an estimated maximum annual process contribution of 15µg/m^3 for mineral extraction activities.

The IAQM Guidance indicates that the greatest potential for high rates of dust deposition and elevated PM_{10} concentrations occurs within 100m of dust-generating activities [92]. EPA's AG4 Guidelines on determining background concentrations requires up to 2-3 years of data [101].

When determining the background concentration of PM_{10} at the Site of the Proposed Development, a 2-year average (2022-2023) of annual PM_{10} concentrations from the closest Zone D monitoring station, i.e. Enniscorthy – 14.2µg/m^3 (section 9.3.3 above).

Table 9-9 shows the Predicted Environmental Concentrations ('PEC') of ambient PM10, which sums the expected process contribution to the background concentrations in µg/m3.

Table 9-9: Calculated PEC from Proposed Development

Parameter	PM_{10} concentrations (µg/m^3)
Maximum Process Contribution*	15µg/m^3
Background Concentration**	14.2µg/m^3
Predicted Environmental Concentration ('PEC')	29.2µg/m^3
Annual AQS Limit for PM_{10}	40µg/m^3

***determined from the IAQM guidance, ** derived from the nearest EPA station (2-years)**

The PEC is 29.2µg/m^3, which is below the Annual AQS of 40 µg/m^3. According to the IAQM Guidance [92], 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. The effects on ambient PM_{10} concentrations as a result of the Proposed Development were determined to be not significant.

9.5.2 Disamenity Dust Risk Assessment

As per the IAQM Guidelines [92], the assessment of disamenity dust follows the Source-Pathway-Receptor Concept, whereby a combination of the Residual Source Emission (Source), frequency of wind speeds (Pathway) and the distance of the receptors to the source (Receptor) determines the likely impacts 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 9-10 below shows the estimation of the magnitude of Residual Source Emissions.

The magnitude of the 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 designed-in mitigation, see section 9.6.1. The assessment in Table 9-10 was completed in accordance with the IAQM Mineral Dust Guidance [92], see Appendix 9-1. The site preparation and mineral extraction phases will occur simultaneously as detailed in section 9.4.1.

Table 9-10: Classification of Residual Source Emissions

Activity	Activity Details (all values are approximate)	Magnitude of Residual Source Emissions
Site Preparation	• Active site area for excavation ca. 7.75 ha; • There will be ca. 1,140,762m^3 of aggregates or ca. 2,053,372 tonnes of aggregate extracted over the duration of the Proposed Development (15-16 years); • The WFP active on the northern portion of the Site until August 2026 will include the importation of ca. 23,000t of soil per annum and may	**Medium**

Activity	Activity Details (all values are approximate)	Magnitude of Residual Source Emissions
	overlap during the initial Phase of the Proposed Development; • dry and wet screening plants, two loading shovels, an excavator, a bulldozer will be used daily for the processing and movement of aggregates; and, • Stockpiling will occur.	
Mineral Extraction	• dry and wet screening plants, two loading shovels, an excavator, a bulldozer will be used daily for the processing and movement of aggregates;	**Medium**
Material Handling	• Majority of materials handled will be in the quarry void; • Majority of activities that will take place >50m of the Site boundary, and, • Two loading shovels will be used daily.	**Medium**
Onsite Transportation	• There will be up to 41 HGV movements (41 trips inward and 41 trips outward) collecting aggregates per day; • HGVs will transport materials via gravel haul routes to the quarry void and will pass through a wheel wash before exiting the quarry via the local internal access road to the N81; • HGVs traversing unpaved access routes will be minimised, where practicable; and, • HGVs will be subject to current speed limits (i.e. 15km/hr).	**Medium**
Stockpiling/Exposed Surfaces	• Stockpiling of aggregate will occur within the quarry pit, hence providing some cover from the wind.	**Medium**
Offsite Transportation	• There will be up to 41 HGV outward trips from the Site per day; • HGVs will primarily traverse well maintained access routes; • The HGVs will go through awheel wash before leaving the Site; and • There will be a road sweeper available to clean public roads, if necessary.	**Medium**

The residual source of emission quantifies the dust magnitude expected to be generated by activities, including built-in designed mitigation measures, but also any additional mitigation measures applied. The IAQM guidance criteria for the Proposed Development was determined to have a "medium" residual source of emissions. To determine the impact on sensitive receptors, it is important to consider how the dust will be transported, i.e. the Pathway Effectiveness [92]. The site-specific factors considered to determine the Pathway Effectiveness of the dust emissions are the distance and direction of receptors, relative to the prevailing wind directions.

For each receptor, wind frequency with speed >5m/s from the direction of the dust source emission was calculated for the five years of Met Éireann data for the EPA Oak Park monitoring station (2020-2024). A wind speed of 5m/s is characterised as a moderate breeze and is used as a general threshold for determining when dust dispersion is most likely to occur [92]. The IAQM indicates high risk meteorological conditions 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, the meteorological information used for the risk assessment was filtered to only represent dry days. The direction and frequency of these wind speeds on dry days are shown in Figure 9-6 below.

Criteria for wind speed, ranging from infrequent to very frequent, are detailed in Appendix 9-1. Table 9-11 below details the categorisation of wind related to each sensitive receptor along with the pathway effectiveness, as per the IAQM Guidelines [92].

When categorising the receptor distance from the dust source, close represents a receptor less than 100m from the source, intermediate represents a receptor between 100-200m from the dust source and distant represents a receptor between 200-400m from the dust source. Table 9-11 below details these sensitive receptors and their classification based on the Pathway Effectiveness.

As all the SR's are residential dwellings, their sensitivity to dust deposition is high. All the ER's are points along the SAC, and as a conservative approach, these ER's are of high sensitivity to dust deposition.

Considering the distance of the receptors from the emission source and the frequency of winds (>5.0m/s) on dry days, the pathway effectiveness was derived for each sensitive receptor. Table 9-11 presents the pathway effectiveness for the six receptors.

Figure 9-6: Dry Days Wind rose for Oak Park synoptic station 2020-2024

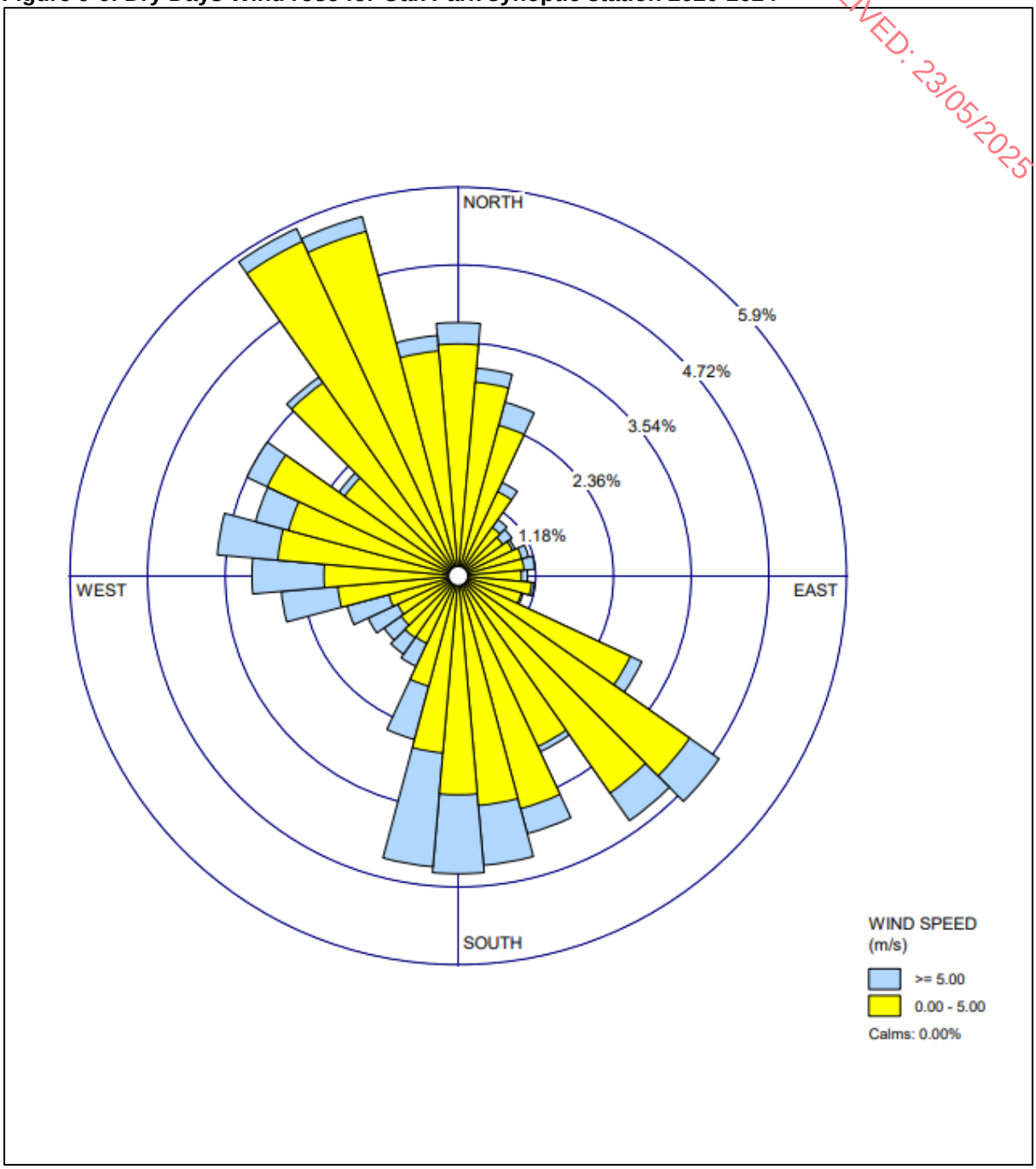


Table 9-11: Classification of Pathway Effectiveness

ID (Receptor Sensitivity	Distance from the Emission Source (Orientation to emission source)	Frequency of wind from the direction of dust source (including dry weather) (>5.0m/s)	Pathway Effectiveness
SR01 **(High)**	ca.22m north **Close**	2.44% (444 hours) coming from the southeast (125-175 degrees) **Infrequent**	**Ineffective**

ID (Receptor Sensitivity	Distance from the Emission Source (Orientation to emission source)	Frequency of wind from the direction of dust source (including dry weather) (>5.0m/s)	Pathway Effectiveness
SR02 **(High)**	ca.194m west **Intermediate**	0.8% (147 hours) coming from the east southeast (95-135 degrees) **Infrequent**	**Ineffective**
SR03 **(High)**	ca.245m south west **Distant**	0.4% (66 hours) coming from the northeast (35-65 degrees) **Infrequent**	**Ineffective**
ER01 **(High)**	ca.5m (northwest) **Close**	3.6% (649 hours) coming from the southwest (185-235 degrees) **Infrequent**	**Ineffective**
ER02 **(High)**	ca.5m (east) **Close**	3.7% (677 hours) coming from the east/ east northeast (255-305 degrees) **Infrequent**	**Ineffective**
ER03 **(High)**	ca.5m (southeast) **Close**	1.1% (202 hours) coming from the northwest (315-5 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.

To identify the potential risk of dust impact on the receptors, the pathway effectiveness and residual emission sources were considered together [92].

The estimation of dust impact risk from this process is outlined in Table 9-12.

Table 9-12: 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
ER01	Medium	Ineffective	Negligible Risk
ER02	Medium	Ineffective	Negligible Risk
ER03	Medium	Ineffective	Negligible Risk

The risk of dust impact has been estimated to have a 'Negligible Risk' to human receptors SR01-SR03 and to ecological receptors ER01-ER03.

To determine the magnitude of dust effects on the receptors, the risk of dust impact and receptor sensitivity were considered together and presented in Table 9-13.

Table 9-13: Magnitude of Dust Effect on Receptors

ID	Receptor Sensitivity	Dust Impact Risk	The Magnitude of Dust Effect
SR01	High	Negligible Risk	Negligible Effect
SR02	High	Negligible Risk	Negligible Effect
SR03	High	Negligible Risk	Negligible Effect
ER01	High	Negligible Risk	Negligible Effect
ER02	High	Negligible Risk	Negligible Effect
ER03	High	Negligible Risk	Negligible Effect

It was determined that the magnitude of dust effect will be Negligible as a result of the Proposed Development. Therefore, the effects of the Proposed Development on air quality will be not significant at the nearest identified human and ecological receptors.

9.5.3 Unplanned Events

Plant refuelling, if required, will occur onsite by a trained operator in a designated area. Nevertheless, where refuelling occurs there is always a risk of fire, which could result in emissions to air. The likelihood of such an occurrence is considered low, and the effect of consequences is considered medium. However, any adverse effect on air quality would be short-term, as the fire would be confined to the refuelling location onsite, and extremely unlikely to spread to outside the Site boundary.

9.6 Proposed Mitigation Measures

9.6.1 Dust Mitigation Measures

Mitigation measures for the Proposed Development are divided into general measures (e.g. Site management and maintenance) and those more specific to the construction/operation/restoration stages of the Proposed Development.

The Disamenity Dust Risk Assessment for the Site determined that there was a 'Negligible Risk' for dust impacts at all of the assessed receptors. Notwithstanding, mitigation measures will be adopted during each stage of the Proposed Development. Table 9-14 below details the mitigation measures associated with the Proposed Development.

Table 9-14: Proposed General 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 initial phase of the Construction-Operational Stage and maintained until the end of the Restoration Stage. The hedgerows, once mature, should result in dense foliage; • Extraction of the Site will be done in phases, which will help to reduce large areas of exposed soil reducing the risk of disamenity dust leaving the Site boundary; • HGVs entering/exiting the Site will occur via the existing wheel wash; and, • Exposed surfaces, e.g. topsoil and overburden storage mounds, will be planted with fast-growing plants.
Construction and Operational Stage The following mitigation measures will be implemented to minimise dust generation, during the Construction and Operational Stages: **General** • All dust and air quality complaints will be recorded, cause(s) identified, appropriate action taken; • Complaints log will be maintained at the Site office, available for review at any reasonable time; • Training will be to Site personnel on dust mitigation measures to be implemented at the Site; • Regular inspections of Site works will be conducted. The frequency of these inspections will be increased to coincide where the risk of impact is higher during dry and/or windy conditions; • Good communications with the local community will be maintained.
Site preparation • Soil stripping and overburden handling will be avoided during dry and windy (>5.0m/s) conditions; and • Overburden will only be worked when it contains a high moisture content.
Aggregate processing • Screening will take place within sheltered parts of the quarry to reduce the likelihood of transport of dust via wind; • Material will be dampened during dry periods prior to crushing operations; • 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; • Clearance of any spillage during extraction will be undertaken regularly to minimise accumulation of loose dry materials; and, • Minimisation of drop heights will be maintained.
Vehicle movements • Abrupt changes in vehicle direction will be avoided where possible; • Loaded HGVs will be covered during windy conditions (>5.0m/s) as practicable; • Regular clearing, grading and maintenance of haul routes will be conducted;

General Mitigation Measures for the Entire Site
• All vehicles will adhere to 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; • HGVs will pass through wheel wash prior to leaving the Site; and, • Road sweepers will be utilised to maintain local roads on a need-to basis.

9.6.2 Site Restoration Stage

Relevant mitigation measures listed in Section 9.6.1 will be implemented during the Site Restoration Stage, if and as required. Given the proposed restoration design, dust generation is not anticipated to be significant during this stage.

9.7 Potential Cumulative Ambient Dust 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 over short periods of time. As such, given the short-term and intermittent nature of these 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 existing WFP activities were included in the Disamenity Dust Risk Assessment presented in section 9.5.2 and the effects were determined to be 'Negligible' and these will be further reduced insofar as practicable with the mitigation measures detailed in section 9.6.

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 9.5.1, which identified there was a low likelihood 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.

9.8 Interactions with other Environmental Attributes

- Chapter 6 – Biodiversity: Air quality can potentially impact ecosystems; however, this assessment demonstrated that the dust from the Proposed Development will have no negative effects on ecosystems;
- Chapter 10 – Climate: Potential emissions associated with vehicle movement onsite can influence GHG emissions associated with the Proposed Development. These potential effects have been further detailed in the climate chapter; and,
- Chapter 13 – Traffic: Air quality can be impacted by increased traffic volumes. However, the changes to traffic volumes were deemed to be not significant as a result of the Proposed Development and therefore will have a not significant effect on local or regional air quality.

9.9 Residual Effects

Given the baseline environment, type and intensity of activities, and mitigation measures to be implemented, the potential residual effect from ambient dust (or PM_{10}) is considered to be "not significant".

For disamenity dust, a negligible effect is expected without appropriate mitigation measures in place. This will be further reduced once the prescribed mitigation measures detailed in section 9.6 are implemented.

9.10 Monitoring

Section 9.3.2.1 above details the historical locations of Bergerhoff monitoring associated with the Site. Four locations are currently located around the boundary of the quarry (D1, D2, D3, D4). The location of these points is shown in Figure 9-2 above. These monitoring locations are proposed for ongoing Bergerhoff monitoring.

9.11 Reinstatement

Following the completion of extraction activities, the Site will undergo a comprehensive reinstatement and restoration process designed to return the land to a productive and environmentally sustainable condition. The strategy was developed in accordance with best practice guidance and is intended to restore soil functionality and ensure long-term integration of the site with the surrounding landscape.

The restoration stage will be carried out in line with a dedicated Restoration Plan, which has been prepared by MOR Environmental and accompanies this planning application (refer to Appendix 6-1).

9.12 Difficulties Encountered

No difficulties were 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 plans, standards and guidance documents were used to assess the baseline conditions and in the assessment of potential impacts on climate associated with the Proposed Development:

- Wicklow County Development Plan 2022-2028 [6];
- Wicklow County Council Climate Change Adaptation Strategy, 2019 [103];
- Wicklow Climate Action Plan 2024 – 2029 [104];
- Wicklow County Council Climate Change Risk Assessment, 2023 [105];
- Wicklow County Council Summary Report, 2023 [106];
- Institute of Environmental Management and Assessment ('IEMA'), *Environmental Impact Assessment Guide to Assessing Greenhouse Gases and Evaluating their Significance* (2nd Edition), 2022 [107];
- Intergovernmental Panel on Climate Change ('IPCC'), *Guidelines for National Greenhouse Gas Inventories*, 2019 [108];
- IPPC, *Sixth Assessment Report (AR6)*, 2023 [109];
- ISO 14064, *Part 1 Specification with guidance at the organizational level for quantification and reporting of greenhouse gas emissions and removals*, 2018 [110];
- Environmental Protection Agency ('EPA'), *Ireland's Climate Change Assessment ('ICCA')*, 2024 [111];
- Department of the Environment, Climate and Communications, *Climate Action Plan 2025"*, 2025 [112];
- Department of the Environment, Climate and Communications, *National Adaptation Framework, Planning for a Climate Resilient Ireland*, 2024 [113];
- Department of Environment, Climate and Communications, *Guidelines for Local Authority Climate Action Plans, Technical Annex B – Climate Change Risk Assessment,* 2023 [114];
- Department for Energy Security and Net Zero ('DESNZ'), *Greenhouse gas reporting: conversion factors 2024,* 2024 [115];
- Transport Infrastructure of Ireland ('TII'), *Carbon Tool*, 2025 [116]; and,
- EPA, *Climate Ireland Platform*, 2025 [117].

10.2.1 Assessment Boundary

Anthropogenic GHG emissions have a global effect when they are released in large quantities into the atmosphere over long periods of time – decades, or longer; therefore, assessing the effects of GHG emissions of a Proposed Development at a local level is inconsequential. GHG emissions are not geographically circumscribed. Even at a national scale, the effect of the

GHG emissions of an entire country the size of Ireland has no noticeable effect on the global, national or regional climate as stand-alone emissions. It is cumulative, global anthropogenic GHG emissions that cause noticeable changes in global, national and regional climate.

Nonetheless, given the importance of climate change and the fact that any project will contribute to an increase or decrease in GHG emissions, an assessment is required.

The potential effects of the Proposed Development on climate change were determined through an assessment of the sources of GHG emissions from the Proposed Development. The assessment of GHG emissions follows IEMA's 2022 *Guidance on Assessing Greenhouse Gas Emissions and Evaluating their Significance* [107].

IEMA guidelines specify the use of emission factors, which were sourced from the TII Carbon Tool [116] and the Department for Energy Security and Net Zero ('DESNZ'). The Carbon Tool is primarily used for lifecycle assessments of national roads, greenways and light rail projects, but provides a comprehensive list of emission factors and methods to calculate GHG emissions that are relative to the Proposed Development.

The potential risks of climate change to the Proposed Development have been assessed by completing a climate vulnerability assessment. By utilising available policy and guidance documentation, 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 any further in this EIAR[9].

10.2.2 Policy Context

The following section will review and highlight relevant policies and legislation relating to the Proposed Development in the context of national, regional and local climate objectives.

10.2.2.1 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 [118]. 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 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 adaptation efforts while creating a framework for the transparent monitoring and reporting of countries' climate goals.

10.2.2.2 National Adaptation Climate Framework

The National Adaptation Framework ('NAF') was developed in 2018 under the Climate Action Law and Low Carbon Development Act 2015. The second statutory NAF, published in 2024

[9] *Microclimate can be described as the climate within 1-2km of a site. The microclimate of an area is influenced by both the natural (topographic) and the built environment (buildings and structures). The construction of new structures impacts existing microclimates and creates new ones of great complexity depending on the design, density and function of the building. Microclimate impacts are typically associated with dense urban development involving tall structures and refer to shading and wind tunnelling.*

[113], supersedes the first NAF, which was developed in 2018. The key objective of the NAF is to support climate action by setting out policies to become resource-efficient and contribute to a low-carbon economy.

The NAF aims to set out a national strategy to reduce the vulnerability of the country to climate change and to improve the enabling environment for adaptation through ongoing engagement with civil society, the private sector and the research community [113].

As the extractive industry is not currently identified under the NAF, this assessment has utilised the plan to provide context only. For the purpose of the assessment of GHG emissions, GHG emissions as a result of the Proposed Development were compared to the National Second Carbon Budget 2026-2030 and Sectoral Emission Ceilings for Transport and Electricity.

10.2.2.3 National Carbon Budget and Sectoral Emission Ceilings

The National Sectoral Emission Ceilings refer to the total amount of permitted GHG emissions that each sector of the economy may produce during a specific period of time.

Under Section 6C of the Climate Action and Low Carbon Development Act 2021 (as amended) [119], sectoral emission ceilings outline the maximum GHG emissions permitted in different sectors of the Irish economy. The Act commits Ireland to achieving climate neutrality by 2050. The carbon budget programme, which includes three successive 5-year periods of national emission ceilings, is measured in tonnes of CO_2e ('tCO_2e')[10].

The 2021 Act established the Climate Change Advisory Council ('CCAC') to provide independent advice to the Irish Government on climate action. The initial provisional Third Carbon Budget of 151 $MtCO_2e$ was proposed in 2021 alongside the establishment of the First and Second Carbon Budgets.

In December 2024, the CCAC published its *Carbon Budget Proposal Report* [120] [120], in which the CCAC proposed to finalise the Third Carbon Budget, following the expiration of the First Carbon Budget (2021-2025). The finalised Third Carbon Budget (2031-2035) of 160 $MtCO_2e$ and a provisional Fourth Carbon Budget (2036-2040) of 120 $MtCO_2e$ were included in the proposal. The proposed increase of the Third Carbon Budget from 151 $MtCO_2e$ to 160 $MtCO_2e$ reflects the most recent data, which focuses on temperature-neutrality pathways as opposed to constraining data analysis of Ireland to meeting net zero emissions in the average global warming potential over 100 ('GWP_{100}') [120]. This resulted in an increase of 9 $MtCO_2e$ from the 2021 provisional Third Carbon Budget.

The proposal was submitted to the Minister for the Environment, Climate and Communications in December 2024, where it will undergo further review and approval and is subject to revision. For the purposes of this assessment, the potential GHG emissions associated with the Proposed Development will be presented in the context of the National Second Carbon Budget as outlined below in Table 10-1.

Table 10-1: Ireland's National Carbon Budget

National Carbon Budget	Emission Ceiling for Assessment Period (tCO2e)
First Carbon Budget (2021-2025)	295,000,000
Second Carbon Budget (2026-2030)	200,000,000

[10] *Carbon Dioxide Equivalent ('CO_2e') is a metric measure used to compare the emissions from various greenhouse gases on the basis of their global-warming potential ('GWP'), by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming potential.*

National Carbon Budget	Emission Ceiling for Assessment Period (tCO2e)
Proposed Third Carbon Budget (2031-2035)*	160,000,000
Provisional Fourth Carbon Budget (2036-2040)*	120,000,000

**The CCAC's proposals for both the Third and Fourth Carbon Budgets were calculated based on GWP100 as published in the IPCC Fifth Assessment Report.*

Within the national carbon budgets, sectoral emission ceilings have been established to reflect the EPA's Emission Inventory. Currently, the sectoral emission ceilings are only presented for the first two carbon budget periods (2021-2025 and 2026-2030). The sectoral emission ceilings for the Third Carbon Budget will be prepared and finalised by the Government following the review of the CCAC proposal as discussed above, as per Section 6C of the Act.

GHG emissions associated with the Proposed Development will be compared with the Sectoral Emission Ceiling for Transport in Table 10-2 below, as approved by the Government in 2022 [121].

Table 10-2: Sectoral Emission Ceilings Relative to the Proposed Development

Sectors	Second Sectoral Emission Ceiling 2026-2030 (tCO_2e)
Transport	37,000,000

10.2.2.4 Climate Action Plan 2025

The Climate Action Plan 2025 ('CAP25') [112] is the third statutory annual update to Ireland's Climate Action Plan, prepared in accordance with the Climate Action and Low Carbon Development (Amendment) Act 2021 [119]. The CAP25 outlines the roadmap to deliver on Ireland's climate ambitions, setting the national climate targets under the Paris Agreement and the European Green Deal to halve Ireland's GHG emissions by 2030 and achieve climate neutrality no later than 2050.

10.2.2.5 Climate Change Risk Assessment

Under the Climate Action and Low Carbon Development (Amendment) Act 2021 [119] as launched by the Minister for the Environment, Climate and Communications, statutory guidelines are in place to assist local authorities in preparing local climate action plans. 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*" [114].

The technical annex was prepared for local councils to aid in preparing climate vulnerability assessments for their constituents. Section 2.0 – Assessing Current Climate Risks and Impacts of the technical annex details guidelines on assessing current climate impacts for local councils, which involve the following:

- *"Identifying the range of climate hazards that have previously affected your local authority and its administrative area; and,*
- *Assessing the exposures and vulnerabilities of the local authority and its administrative area to these hazards."*

In addition, the EPA's 2024 report, *Ireland's Climate Change Assessment* [111] provides a comprehensive scientific assessment of Ireland's climate trends, impacts and risks to guide climate adaptation and mitigation.

Whilst the Climate Change Risk Assessment has been adopted at the county and national level and is, therefore, on 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.

10.2.2.6 Regional Spatial and Economic Strategy ('RSES') for the Eastern and Midland Region

County Wicklow is a part of the RSES. The Eastern and Midland Regional Assembly ('EMRA') is responsible for overseeing the implementation of the RSES, coordinating spatial planning, economic development and climate action across the region.

In addition to economic and development objectives for the Eastern and Midland region, the RSES strives for environmental protection and seeks to combat climate change through the implementation of national Climate Action Plans on a regional level. The RSES 2019-2031 identifies numerous Regional Policy Objectives ('RPOs') for climate change [17], examples of which include:

- **RPO 7.30:** *"Within 1 year of the adoption of the RSES, the EMRA shall seek with other stakeholders to carry out an assessment of transport emissions in the Region to identify GHG forecasting and to analyse the emissions impacts of development in the Region"*;
- **RPO 7.32:** *"With the assistance and support of the Climate Action Regional Offices, local authorities shall develop, adopt and implement local climate adaptation and mitigation strategies which shall address issues including local vulnerability to climate risks and identify and prioritise actions, in accordance with the Guiding Principles of the National Adaptation Framework, National Mitigation Plan"*; and,
- **RPO 7.41:** *"Support and promote structural materials in the construction industry that have low to zero embodied energy & CO_2 emissions"*.

In addition, Wicklow County is a member of the Eastern and Midlands Climate Action Regional Office ('CARO'). The CAROs are established based on geographic and topographic characteristics and aim to enable climate action strategy implementation at a local level.

10.2.2.7 Wicklow County Development Plan 2022-2028

WCC integrates climate resilience and environmental protection into its CDP, for example:

Strategic County Outcome 7: *"Support the transition to low carbon clean energy by facilitating renewable energy use and generation at appropriate locations and supporting the development of off-shore renewable energy enabling infrastructure especially at ports and harbours. Facilitate the sustainable management of waste including the circular economy. Restrict development in areas that are at risk of flooding and protect the natural landscape and biodiversity".*

Further, within the community and economic development strategy presented in the CDP, the following goal is present within the Wicklow Local Economic and Community Plan ('LECP'):

LECP Goal 9: *"Support a shift towards low carbon and climate change resilient economic activity, reducing energy dependence, promoting the sustainable use of resources and leading in the Smart Green Economy."*

10.2.2.8 Wicklow County Council Climate Change Adaptation Strategy

The Wicklow County Council Climate Change Adaptation Strategy forms part of NAF (see section 10.2.2.2 above), which was published in response to the provisions of the Climate Action and Low Carbon Development Act 2015.

The local authority adaptation 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 adaptation 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 Éireann. These weather events were categorised as:

- Heatwave and drought;
- Strong winds and storms;
- Snow and ice / low temperatures;
- High sea levels and coastal flooding; and,
- Heavy rainfall.

These hazards will be further discussed in the context of the Climate Vulnerability Assessment (see section 10.4.3 below).

10.2.2.9 Wicklow County Council Climate Action Plan 2024-2029

In accordance with the Department of the Environment, Climate and Communications guidelines, *Technical Annex B – Climate Change Risk Assessment* [114], Co. Wicklow developed a comprehensive Climate Action Plan 2024-2029 ('CAP'), which outlines the measures that WCC will take to reduce energy use and carbon emissions, achieve climate adaptation, and facilitate stakeholder climate action.

Within the CAP, examples of strategic objectives for climate action are as follows:

- **Strategic Objective 4.1**: *"Ensure business continuity in the face of changing climate and preparedness for extreme weather events.";*
- **Strategic Objective 7.2**: *"Develop collaboration and sharing of experience, promoting economic opportunities that arise from climate action.";*
- **Strategic Objective 7.4**: *"Develop local strategy and raise awareness for the Circular Economy.";* and,
- **Strategic Goal 7, Action No. 4:** *"Support SME's through the:*
    - *Green for Micro programme*
    - *Climate Toolkit for businesses*
    - *Green Start programme with Enterprise Ireland*
    - *Climate Ready Training with Skillnet Ireland*
    - *Energy Efficiency grant."*

10.2.3 Assessing Greenhouse Gas Emissions

Currently in Ireland there is no set methodology for the significance criteria or threshold for GHG emissions for the extractive industry. The quantity of emissions from a quarry depends on the size and type of activities that are occurring within a site. The primary sources of GHG

emissions associated with the Proposed Development will be from the direct emissions associated with HGV movements and the fuel use of plant and equipment.

This EIAR has identified two stages that will need to be assessed, (1) the Construction-Operational Stage and (2) the Site Rehabilitation Stage - Site Closure. Each of these stages have distinct activities associated with the works undertaken.

The potential effects of GHG emissions from the Proposed Development were assessed under the following stages:

- Construction Stage-Operational Stage; and,
- Site Restoration Stage - Site closure.

Potential GHG emissions from the Construction Stage - Operational Stage and Site Restoration Stage-Site Closure have been divided into Scope 1, Scope 2 and Scope 3 GHG emissions, as recognised by the ISO 14064 Part 1 Standard. Table 10-3 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.

According to the International Panel on Climate Change ('IPCC') 2019 refinement of the 2006 publication of *Guidelines for National Greenhouse Gas Inventories* [108] and as recognised by the ISO 14064 Part 1 Standard [110], GHG emissions can be split into three categories or 'scopes'[11], as presented in Table 10-3 below.

Table 10-3: Scoped Emissions used in GHG Assessment

Scope	Description and Source
Scope 1: Direct Emissions	Direct emissions from sources that are owned or controlled by the reporting entity, such as emissions from the combustion of fossil fuels in boilers and vehicles
Scope 2: Indirect Emissions Associated with the Proposed Development	Indirect emissions associated with energy consumption consumed but not produced by the reporting entity, such as emissions from the generation of purchased electricity, heat or steam
Scope 3: Indirect Emissions	Other indirect emissions that are considered a consequence of the reporting entity's activities, such as vehicle emissions from transporting materials, products and employees to and from a site.

10.2.3.1 Construction - Operational Stage

As detailed in section 3, the Construction - Operational stages of the Proposed Development are intertwined, with construction and operational activities occurring simultaneously, depending on the stage. The Construction and Operational Stages of the Proposed Development will last between 15 and 16 years (see section 3 for further details).

Scope 1

Scope 1 emissions will arise from the operation of plant/equipment and HGVs operated and owned by the Proposed Development. These include:

[11] *Scope 1 Direct Emissions and Scope 2 and 3 Indirect Emissions do not relate to the EIA's Directive of "Direct" and "Indirect" effects and are assessed separately.*

- GHG emissions associated with fuel use for the operation of plant / equipment;
- HGVs used to delivery of aggregates; and,
- Diesel generator used to power on-site activities (lighting, water recycling system, etc.).

Scope 2

There are no Scope 2 emissions associated with the Proposed Development.

Scope 3

Scope 3 GHG emissions include emissions from indirect sources, such as movements not owned by the company (contracted HGV movements, delivery vehicles and employee vehicles). These include the following:

- GHG emissions sourced from contracted Light Goods Vehicle ('LGV') movements and delivery vehicles. It is expected that all delivery vehicles will be standard diesel-powered, and that LGV related traffic will be an average medium car.

Potential Scope 1 emissions associated with the Proposed Development will be examined for a typical operating year. The data presented is based on the information provided in this EIAR (plant numbers) and estimations of HGV trips (i.e. 41 outward trips). Although a portion of the HGVs will not be owned by the Applicant and will be operated by a third party for the purposes of this assessment, it was assumed that all HGVs will be Scope 1 GHG emissions.

Scope 1 emissions associated with the Proposed Development will arise from the operation of plant / equipment, operated and owned by the Applicant. The plant / equipment expected to be operating on-site within the Proposed Development boundary includes:

- One Excavator;
- One Dry Screener;
- One Wet Screener;
- One Bulldozer;
- Two Loading Shovels; and,
- One Diesel Generator.

A conservative approach was adopted for this assessment, and it has been assumed that all plant will run concurrently for 68hrs per week. This will not occur, however, in order to conservatively assess the effects of the GHG emissions from the Proposed Development in the context of National Emissions, this approach has been employed for the assessment. In reality, not all plant will run concurrently for the full duration of the operating week.

It is estimated that there will be 41 loads per day, or 82 HGV movements (41 truck movements incoming unladen and 41 outgoing movements laden), will be required in a typical day of outgoing aggregates at the Proposed Development. With regards to the HGV travel distance, a conservative estimate of 50km per day (100km round trip) was used for the assessment.

The estimation of the tonnes of CO_2e that are to be emitted from Scope 1 emissions associated with the Proposed Development was determined using the Department for Energy Security and Net Zero ('DESNZ') conversion factors 2024 [115]. The potential CO_2e emitted from the plant and equipment was estimated based on the fuel capacity of the equipment, assuming all are powered by mineral diesel (measured in L/hr). For HGVs, emissions were calculated based on the $kgCO_2e$ emitted per km travelled from mineral diesel fuel. Table 10-4 below summarises this emission input data for equipment used to calculate CO_2e.

Table 10-4: Summary of GHG Emission Input Data for Plant and Equipment

Equipment Type	Fuel Consumption (L/hr)*	Operational Hours (per week)	Conversion Factors Diesel (Total kg CO_2e/litre)
Bulldozer	30	68	2.66
Excavator	18	68	2.66
Dry Screener	20	68	2.66
Wet Screener	20	68	2.66
Loading Shovel*	12	68	2.66

**Fuel use per one number of plant. Based on general industry standard plant.*

Table 10-5 below details the parameters used for truck movements, assuming each truck will be 100% laden. The HGVs are also going to be fuelled by mineral diesel.

Table 10-5: Summary of CO_2e Input Data for HGVs – Construction - Operational Phase

Vehicle Type	Laden	Fuel Type	Distance Travelled per movement	Conversion Factor ($kgCO_2e$)*
HGVs (41) – inwards	100%	Mineral diesel	50km	0.98
HGVs (41) – outwards	0%	Mineral diesel	50km	0.64

**Emission Factor kg of CO_2e per km for All HGVs 100% laden and 0% laden from DESNZ 2024.*

The emissions factor used for the Diesel Generator was obtained based on a 300kVA model IPCC standard and the input data is shown in Table 10-6 below.

Table 10-6: Summary of CO_2e Input Data Diesel Generator

Equipment Type	Fuel Consumption Diesel (L/hr)	Operational Hours (per week)	Conversion Factors (Total kg CO_2e/litre)
Diesel Generator	55	68	2.68

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 [24]. 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. 14 trips (seven incoming and seven outgoing) will be used per day to cover staff trips and miscellaneous journeys.

To ensure consistency in the approach, the emission factors used in this assessment assume an average-laden condition for all Scope 3 vehicles, both entering and leaving the Site (0.1645kgCO_2e/km).

10.2.3.2 Site Restoration-Site Closure

The main emissions associated with this stage of the Proposed Development are Scope 3 emissions arising from HGVs delivering soils to the Site over a two-year period. Table 10-7

below details the parameters used for HGV movements, assuming one HGV movement will be 100% laden and the return journey will be 0% laden. The HGVs are assumed to be fuelled by mineral diesel.

Table 10-77: Summary of CO_2e Input Data for HGVs Site Restoration – Site Closure

Vehicle Type	Laden	Fuel Type	Distance Travelled per movement	Conversion Factor ($kgCO_2e$)*
HGVs (41) – inwards	100%	Mineral diesel	50km	0.98
HGVs (41) – outwards	0%	Mineral diesel	50km	0.64

**Emission Factor kg of CO_2e per km for All HGVs 100% laden and 0% laden from DESNZ 2024.*

Other minor GHG emissions may arise from the use of temporary plant spreading the soils and seeding. However, due to the Restoration-Site Closure stage occurring 15-16 years after the initial Construction-Operational Stage, these minor emissions have been screened out for the purposes of this assessment. Further, these emissions may be offset due to changes in land use following the Site closure. Calculating such emissions is beyond the scope of this assessment.

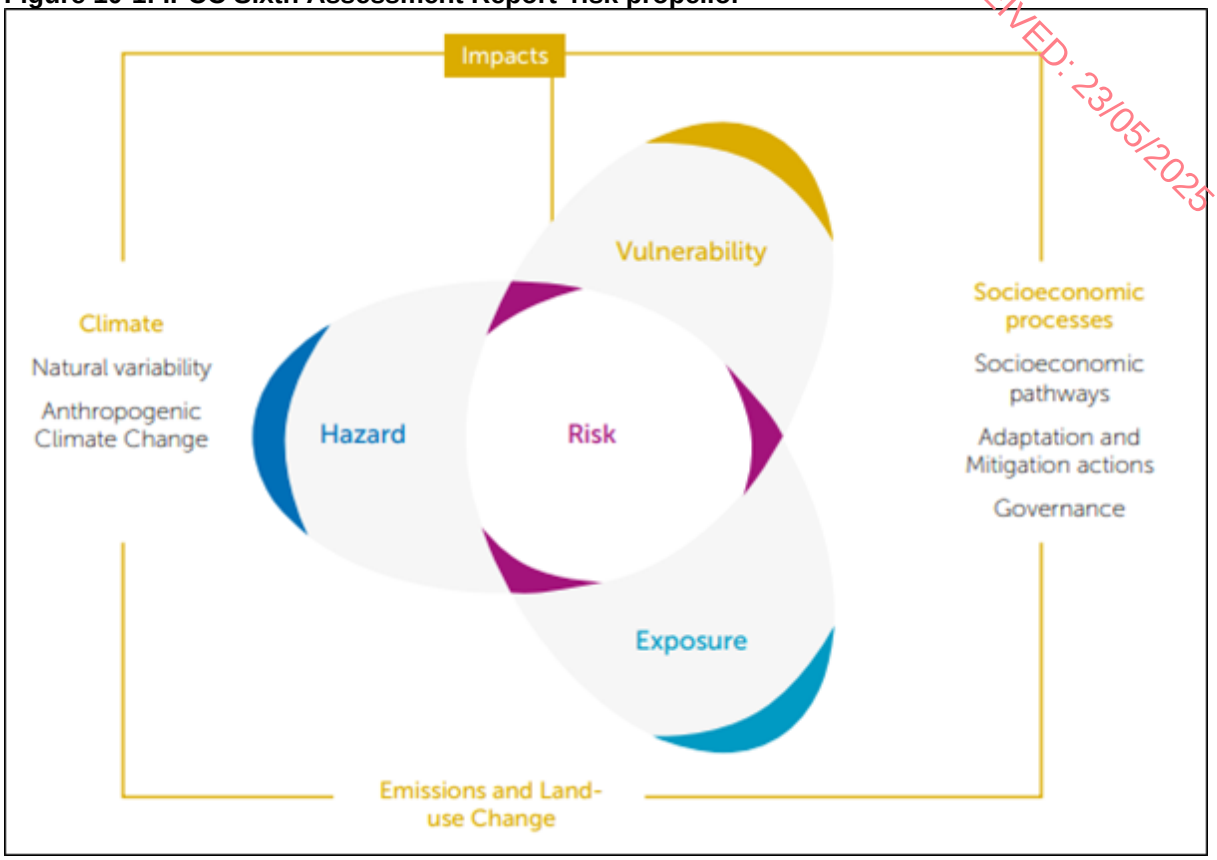
10.2.4 Climate Change Risk Assessment

The IPCC define three key components of a climate risk that interact and combine to generate the risks of climate impact [109]. 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 provision, 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. people's underlying health conditions can be worsened by high temperatures or heatwaves).

The methodology presented in Figure 10-1 below displays the framework for identifying potential climate risks associated with a development and, in turn, completing a climate risk assessment.

Figure 10-1: IPCC Sixth Assessment Report 'risk propellor'



In adherence to "Technical Annex B – Climate Change Risk Assessment" [114] provided for local councils, the assessment process entails the identification of the characteristics of climate hazards. This involves both the frequency and magnitude of impacts across the "Asset Damage" category.

Given the scale and nature of the Proposed Development, the climate risk assessment will focus exclusively on the physical vulnerabilities of the Proposed Development to climate hazards, both present and future. According to Technical Annex B, these physical vulnerabilities are described 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 the primary 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: Climate Vulnerability Assessment. 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 from 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 were identified as likely to be of significance if the current climate hazards exposed to the Proposed Development are determined to be significant. A detailed desk-based review of available resources (for example, Met Éireann and Climate Ireland) were used to determine potential climate hazards exposed to the Proposed Development and their projected changes in the future.

10.3 Receiving Environment

10.3.1 Baseline Climate

Ireland's climate is primarily driven by ocean influences, mainly the Atlantic, resulting in maritime climate conditions. This results in relatively warm summers and mild winters. The wettest months of the year typically occur between November and 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, the climate is weather data averaged over a 30-year period to determine long-term trends in important variables such as temperature, precipitation and wind speed. The period of 30 years is considered long enough to smooth out year-to-year variations. Met Éireann has compiled a set of climate averages for the period 1991 to 2020 as a baseline period for day-to-day weather and climate conditions.

The closest Met Éireann weather station to the Proposed Development with available 30-year averaged data for the 1991-2020 period is Casement Station, Co. Dublin, located ca. 35.6km from the Proposed Development.

Table 10-88: Climate Averaged Data from Casement Station (1991-2020)

Variable	1991-2020 Average
Annual mean temperature (°C)	9.9
Annual rainfall (sum of mean monthly totals in mm)	783.5
Annual mean wind speed (kt/s)	10.1
Mean number of days with gale force winds	12.6
Mean number of days with fog	19.8

Regarding Ireland's observational climate, the annual average temperatures in Ireland are approximately 1.0°C higher than they were in the 20th century, with 2022 being the warmest year in Ireland to date, according to the EPA's 2024 report *Ireland's Climate Change Assessment* [111]. In addition, the Met Éireann 2024 report *Long-term air temperature averages for Ireland 1991-2020* [122] presents the following results from the 1991-2020 period:

- The annual mean air temperature for Ireland for the 1991-2020 period is 9.8°C, showing an increase of approximately 0.7°C compared to the 1961-2020 period; and,
- Based on data from the 1961-2020 period, the annualised increase in mean temperature in Ireland is 0.22°C per decade.

Similarly, the findings from the Met Éireann 2024 report *Long-term rainfall averages for Ireland 1991-2020* [123] highlight the following:

- Despite regional variations, annual average rainfall has increased by approximately 7% between the periods 1961-1990 and 1991-2020 across all regions of Ireland, with the greatest increases being seen in the west and north of the country; and,
- A significant increase in summer rainfall has been observed in the 1991-2020 period in comparison to the previous averaging period.

10.3.2 Projected Future Climate Change

Observed changes in Ireland's climate over the last century align 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 overestimating projected coal outputs. The range of these scenarios provides an intermediate and worst-case estimation of potential environmental changes 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 (RCP4.5) 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).

10.3.3 Climate Hazards

According to the IPCC's *Sixth Assessment Report (AR6)*, climate impacts are becoming more severe and are manifesting at an accelerated pace [109]. These impacts can have cascading effects on both natural and human systems, often interacting with other human activities. The IPCC defines climate risk as the potential for adverse consequences to human and ecological systems, recognising the diverse values and objectives associated with these systems [109].

The Climate Change Risk Assessment carried out by WCC identified the following as the most significant current climate hazards in Co. Wicklow [105]:

- Severe Wind;
- Cold Snaps and heavy snowfall;
- Pluvial flooding and river flooding;
- Coastal flooding and coastal erosion; and,
- Heatwave.

According to the WCC Climate Change Risk Assessment [105], severe wind has been the climate hazard most frequent to Co. Wicklow over the period 1986-2022, followed by coastal flooding and erosion, river flooding and cold snaps. Heatwaves, drought and groundwater flooding have been the least frequent climate hazards to impact the county in the same period.

The climate hazards that have the potential to impact the Proposed Development were identified from a desk-based review of available resources. Following this review, the below hazards were identified as relevant to the Proposed Development:

- Cold Snaps;
- Extreme Rainfall;

- Severe Wind;
- Heatwave, drought;
- Flooding;
- Wildfires; and,
- Landslides.

The Proposed Development is located ca. 39.5km from the coast, therefore, it is not at risk of coastal flooding or coastal erosion. As a result, these climate hazards have been screened out of this climate vulnerability assessment and will not be considered further.

Further, aspects of some hazard categories, such as ocean acidification and sea level rise, will not have a direct impact on the Proposed Development, due to the nature of activities and its location. As a result, these hazards have been screened out of consideration when identifying the level of risk associated with the Proposed Development.

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 during the Construction Stage-Operational Stage of the Proposed Development:

- Movement of HGVs associated with the transport of aggregates to market; and,
- Use of machinery on-site.

GHG emissions will mainly arise from the following activities during the Site Restoration Stage - Site closure of the Proposed Development:

- Movement of HGVs delivering soil to the Site.

10.4.1.1 Construction Stage - Operational Stage

As per the description of the Proposed Development presented in section 3, The construction and operational stages will be interlinked, progressing simultaneously and split into four phases.

The GHG emissions associated with the Construction and Operational Stages have been split into scope 1, 2 & 3 GHG emissions as detailed in section 10.2.3 and will be presented as a per annum quantity for the duration of the lifespan of the Proposed Development.

10.4.1.2 Site Restoration Stage – Site Closure

Following the completion of extraction activities, the Site will undergo a comprehensive reinstatement and restoration process designed to return the land to a productive and environmentally sustainable condition. The strategy has been developed in accordance with best practice guidance and is intended to restore soil functionality and ensure long-term integration of the site with the surrounding landscape. This stage will last approximately two years.

HGVs will deliver ca. 38,750m³ of soil to the Site to complete the restoration works. For the purpose of this assessment, it is conservatively assumed that the HGV movements will remain the same as the Construction & Operational Stage of the Proposed Development. Therefore, there will be 41 HGV movements per day travelling 50km per one-way trip (100km return).

10.4.2 GHG Emissions Assessment

10.4.2.1 Construction Stage - Operational Stage

The GHG emissions have been calculated to represent a typical year of operations (303 days section 3.5.1) and were compared against the relevant sectoral emission ceilings to evaluate significance.

The Construction Stage-Operational Stage is expected to last up to ca. 15-16 years. However, emissions are presented as a per annum quantity. Table 10-9 below shows the predicted total Scope 1 GHG emissions per annum.

Table 10-99: Scope 1 GHG Emissions Plant & HGV Movements

Plant Name	Estimated Annual Fuel Consumption (L/year*)	Conversion Factor for Mineral Diesel (Total kg CO_{2e})**	Tonnes of CO_{2e} per year	Mt of CO_{2e} per year
Bulldozer	103,020	2.66	274.03	0.00027
Excavator	61,812	2.66	164.42	0.00016
Dry Screener	68,680	2.66	182.69	0.00018
Wet Screener	68,680	2.66	182.69	0.00018
Loading Shovel x 2	82,416	2.66	219.23	0.00022
Diesel Generator	188,870	2.68	502.39	0.00050
Number of HGVs per day	**Distance Travelled per trip (km)**	**Conversion Factor (100% laden, 0% laden)*** **	**Tonnes of CO_{2e} per year**	**Mt of CO_{2e} per year**
41	100	0.98 0.64	1,006.26	0.001006
Total Predicted Scope 1 CO_{2e} (Mt)	**0.00253**			

**Based on 303 days of operations per year.*

***Emission factor for 100% mineral diesel from DESNZ 2024.*

****Emission Factor kg of CO_2e per km for All HGVs 100% laden and 0% laden from DESNZ 2024.*

Scope 3 GHG emissions comprise of employees and deliveries travelling to and from the Site. Table 10-10 displays the potential Scope 3 GHG emissions associated with the Development for a typical year of activity.

Table 10-1010: Calculation of CO_2e for Plant and Equipment (Scope 3 GHG emissions)

Number of LGVs per day	Distance Travelled (km/yr)*	Conversion Factor for Mineral Diesel (Total kg CO_{2e})	Tonnes of CO_{2e} per year	Mt of CO_{2e} per year
14	72,114	0.1645	11.8628	0.000012

Number of LGVs per day	Distance Travelled (km/yr)*	Conversion Factor for Mineral Diesel (Total kg CO_{2e})	Tonnes of CO_{2e} per year	Mt of CO_{2e} per year
Total Predicted Scope 3 CO_{2e} (Mt)	**0.000012**			

**Typical operating year of 303 days as the quarry did not operate on public holidays and Sundays*

Table 10-11 below shows the estimations of Transport GHG emissions produced per operating year of the Proposed Development described in the context of the Transport Sectoral Emissions Ceiling.

Table 10-1111: Contributions of Transport GHG emissions per annum from the Proposed Development to the Second Transport Sectoral Ceiling

Total CO_{2eq} Transport - Development (Mt) per year	Second Transport Sectoral Emission Ceiling 2026-2030 (MtCO2e)	% of contribution from the Development (per year)
0.001018	37	0.0028%

**Typical operating year of 303 days as the quarry did not operate on public holidays and Sundays*

Table 10-12 below shows the estimations of CO_{2e} produced per operating year of the Proposed Development described in the context of the Second National Carbon Budget.

Table 10-1212: Contributions of the Proposed Development to the Second National Carbon Budget

Total CO_{2eq} - Development (Mt) per year	Second National Carbon Budget (2026-2030) (Mt)	% of contribution from the Development (per year)
0.00254	200	0.001%*

**Percentage presents one year of GHG emissions from the Development in the context of the Second National Carbon Budget 200Mt of CO_2e.*

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".

10.4.2.2 Site Restoration Stage – Site Closure

GHG emissions will mainly arise from the following activities during the Site Rehabilitation Stage - Site closure of the Proposed Development:

- Movement of HGVs delivering soil to the Site (Scope 3).

Table 10-13 below shows the estimations of Scope 3 Transport GHG emissions produced during the Site Restoration Stage of the Proposed Development.

As the Site Restoration Stage will only occur after 15-16 years of the Construction Stage-Operational Stage the GHG emissions will not be compared to the National Carbon Budgets as this is outside the scope of this assessment and will likely occur post 2040.

Table 10-1313: Annual GHG Emissions arising from the Transport of Materials during the Restoration Stage of the Proposed Development

Number of HGVs per day	Distance Travelled per trip (km)	Conversion Factor (100% laden, 0% laden)*	Tonnes of CO_{2e} per year	Mt of CO_{2e} per year
41	100	0.98 0.64	1,006.26	0.001006
Total Predicted Scope 3 CO_{2e} (Mt)	**0.001006**			

**Emission Factor kg of CO_2e per km for All HGVs 100% laden and 0% laden from DESNZ 2024.*

Due to the low contributions of GHG emissions and the short-term duration of the Site Restoration Stage (two years), the effects of the Proposed Development on climate are determined as "not significant".

10.4.3 Climate Vulnerability Assessment

The Climate Vulnerability Assessment determines the potential impacts of climate hazards on the Proposed Development and the frequency of these events. The assessment is attached as Appendix 10-1: Climate Vulnerability Assessment.

To assess the level of risk associated with the Proposed Development, receptors were divided into the following:

- On-site Assets (e.g. plant, equipment and building);
- Inputs (Energy Water);
- Outputs (Mineral Processing, Operating Capacity); and,
- Transport Links.

Table 10-14 below identifies the potential impacts to the identified receptors from climate hazards using the 2024 EPA publication *Ireland's Climate Change Assessment ('ICCA'), Volume 3* [111].

Table 10-1414: Potential Impacts to the Identified Receptors from Climate Hazards

Climate Hazard	Potential Impacts on Proposed Development Receptors
Extreme rainfall and Flooding	Extreme rainfall can inundate the quarry pit, disrupting extraction activities and requiring extensive dewatering efforts.
	Heavy rainfall can result in the destabilising of quarry walls, increasing the risk of landslides or rock collapse
	Increase in flow may cause damage to plant and equipment as a result of flooding
	Saturated ground increases the risk of slope failure, posing a safety risk
	Increased rainfall can result in the washing of suspended solids from all areas, including stockpiles

Climate Hazard	Potential Impacts on Proposed Development Receptors
	and roadways causing blocked drainage infrastructure and offsite pollution
	Flooding can result in suspended solids in run-off, leading to water contamination and sedimentation in nearby waterbodies
	Increases in groundwater levels may affect infrastructure at the Site
Severe Wind	Stockpiles of loose material like sand or gravel can be blown away, resulting in loss of product and contamination of surrounding areas.
	Storms and high winds have the potential to damage infrastructure and on-site equipment
	Strong winds can disrupt the transportation of materials or finished goods
	High winds may contribute to soil erosion, destabilising quarry slopes and increasing the risk of landslides
Temperature related (cold snaps, heatwave and drought)	Freezing temperatures can put added pressure on machinery and equipment, causing malfunction or becoming difficult to operate. Similarly, extreme heat can cause machinery to overheat
	Impacts on infrastructure such as ice on surfaces and melting road surfacing
	Increased sun exposure, heat and severe cold can lead to continuous expansion and contraction of metals and embrittlement of materials such as plastic, rubber and metals, overtime causing weakness and degradation
	Freezing temperatures result in an increased risk of pipework freezing
	In increased temperatures, water used in wheel wash systems or in dust control and screening may evaporate more quickly, requiring additional water resources
	Dry conditions as a result of warmer temperatures or drought may result in increased dust generation, increasing the risk of impact to air quality and contamination of nearby areas.
	Heavy snowfall can halt quarry operations by blocking access roads, covering equipment and creating slippery surfaces that pose a safety risk
Landslides	Landslides have the potential to cause serious structural damage to quarry infrastructure, including roads, equipment and retaining walls

Climate Hazard	Potential Impacts on Proposed Development Receptors
	The instability of quarry slopes poses significant risk to workers
	Landslides can cause erosion, leading to sediment run-off that can contaminate waterbodies
	Blockage of roads as a result of landslides can cause interruptions to the transportation of materials and site operations
	Blockage of drainage systems and rivers, leading to flooding
Wildfires	Extreme heat and flames have the potential to destroy buildings, equipment and infrastructure
	Ash and debris can contaminate water sources and soil
	Hazardous and flammable materials stored on-site increase the risk of explosion
	Wildfires pose a serious health risk, including reduced visibility, smoke inhalation, hazardous material exposure and heat exposure

10.4.3.1 Frequency of Climate Hazards

Based on the Technical Annex B Guidance on current climate hazards, the frequency of the climate hazards was quantified through an analysis of available information. The frequency scores assigned, rated between 1-5 for each hazard, with 5 being the most frequent, are justified below.

The following Met Éireann weather stations were used to analyse 30 years of meteorological data for the purposes of this assessment:

- The Glen of Imaal Station, located ca. 6.3km from the Proposed Development, was chosen to assess the frequency of extreme rainfall, due to its proximity to the Proposed Development and the availability of 30 years of precipitation data; and,
- The Casement Met Éireann Station, located ca. 35.6km from the Proposed Development, was chosen to provide wind and temperature data, due to the availability of 30 years of wind data.

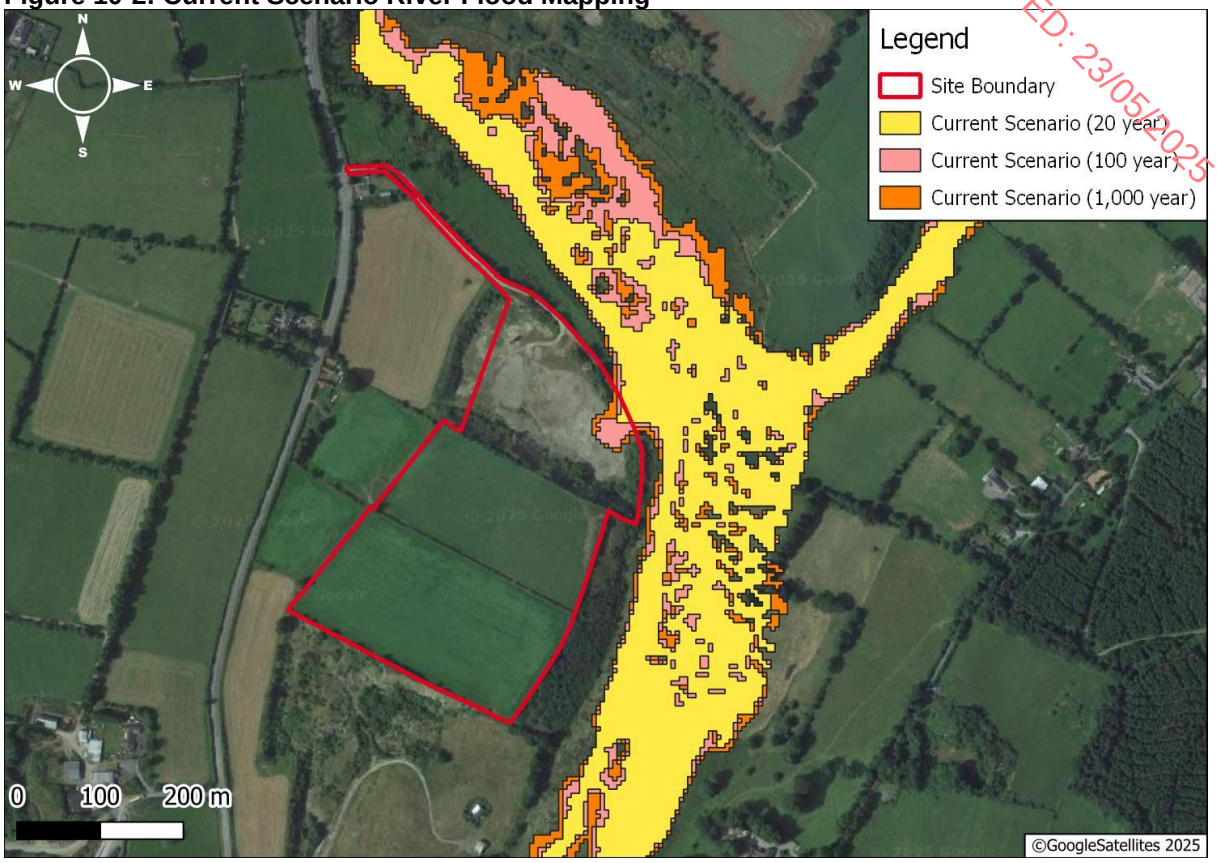
Table 10-1515: Frequency of Current Climate Hazards

Climate Hazard	Current Frequency Score	Current Frequency Description	Justification
Severe Wind	5	Very Frequent	According to Met Éireann, an orange weather warning for wind occurs when 10-minute mean wind speeds are between 65 and 80km/h or wind gusts are between 110 and 130km/h. Met Éireann defines an orange wind warning as *"Infrequent and dangerous weather conditions which may pose a threat to life and property"*.

Climate Hazard	Current Frequency Score	Current Frequency Description	Justification
			Between 1967 and 2024, there were 538 orange warning events for 10-minute mean wind speeds and 119 orange warning events for wind gusts observed at the Casement weather station. A red weather warning for wind occurs when 10-minute mean wind speeds are more than 80km/h or wind gusts are in excess of 130km/h. Met Éireann defines a red wind warning as *"Rare and very dangerous weather conditions from intense meteorological phenomena"*. Between 1967 and 2024, there have been 60 red warning events for 10-minute mean wind speeds and 17 red warning events for wind gusts.
Cold Snaps	5	Very Frequent	According to Met Éireann, a yellow weather warning occurs when low temperature reaches -3°C over a widespread area. An orange weather warning occurs when low temperatures are expected to be below -5°C, at which point the weather event is *"dangerous weather conditions which may pose a threat to life and property."* Between 1964 and 2024, the Casement Station observed 192 orange low-temperature weather warnings. In addition, Met Éireann defines a red weather warning for low temperatures as -10°C for three consecutive nights or more. During the same period, no red weather warnings for low temperatures were identified at the station.
Heatwave/Drought	3	Common	Met Éireann defines heatwaves as five consecutive days with temperatures over 24°C. According to the Casement Met Éireann station, 8 heatwaves occurred between 1964 and 2024.
Extreme Rainfall	3	Common	According to Met Éireann, an orange weather warning for rainfall occurs when daily precipitation exceeds 50mm in a single day. At this point, it is considered *"dangerous weather conditions which may pose a threat to life and property"*. Based on the Glen Imaal Met Éireann Station data, 34 orange weather warnings for rainfall were observed between 1951 and 2024. A red weather warning for rainfall occurs when daily precipitation exceeds 80mm in a single day. At this point, it is considered *"Rare and very dangerous weather conditions from intense meteorological phenomena"*. 2 occurrences of red weather warnings for rainfall were observed at the Glan Imaal Station between 1951 and 2024.
Flooding	2	Occasional	The closest waterbodies to the Site are the Carrigower River, located within the northeastern region of the Site boundary, followed by the Brown's

Climate Hazard	Current Frequency Score	Current Frequency Description	Justification
			Beck (Brook) River, located ca. 50m northeast of the Site. A review of the National Indicative Fluvial Mapping – Present Day database indicates that the Carrigower watercourse, which runs along the east of the Proposed Development, has modelled flood extents affecting a small portion of the northeastern region of the Site. The flood extent falls within a 1% Annual Exceedance Probability ('AEP') and is therefore classified as "Occasional" frequency.
Wildfires	1	Rare	There have been no wildfire events within 5km of the Proposed Development. According to the European Forest Fire Information System ('EFFIS') Wildfire Risk Viewer [124] , the risk of wildfire within the Proposed Development is classified as Low.
Landslides	1	Rare	According to the GSI Landslide Susceptibility Map [125], there are two recorded landslides within 5km of the Proposed Development: GSI_LS12-0250, which occurred ca. 4.8km from the Site, and GSI_LS12-0246, ca. 4.9km from the Site. The susceptibility of the Proposed Development to landslides has been classified as Low by GSI, with a region alongside the eastern boundary of the Site classified as Moderately Low.

Figure 10-2: Current Scenario River Flood Mapping



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.

10.4.3.2 Potential Impacts of the Current Climate Risks

The impacts of current climate risks will result in the disruption to the delivery of services and functions expected to be performed by the Proposed Development. For each of the climate hazards identified, the potential impacts as categorised as "Asset Damage", were determined in accordance with the Technical Annex B Guidelines. This quantification of potential impacts was determined for each of the receptors identified, as presented in Table 10-16 below

Table 10-1616: Potential Impacts of Receptors to "Asset Damage" as a Result of Climate Change

Receptor	Climate Hazard	Impact Score	Classified Asset Impact	Justification
On-site Assets (e.g. plant, equipment and buildings)	Severe Wind	1	Negligible	The highest impacts associated with on-site assets would be from extreme rainfall, flooding and landslides. Due to the nature of activities located within a quarry void, assets would be particularly vulnerable to water. However, some excess surface water can be stored in the quarry floors. The Proposed Development will involve the construction of benches on-site, which are correctly designed and suitable for stabilising slopes to minimise the risk of landslides. The asset damage category of minor is defined as *"an adverse event that can be absorbed by taking business continuity action."*
	Cold Snaps	2	Minor	
	Heatwave/Drought	1	Negligible	
	Extreme Rainfall	2	Minor	
	Flooding	2	Minor	
	Wildfires	1	Negligible	
	Landslides	2	Minor	
Inputs (Electricity and Water)	Severe Wind	2	Minor	According to the WCC Climate Risk Assessment, extreme wind, cold snaps, and heatwaves are the climate hazards with the highest consequences for water supply in Co. Wicklow. Water supply on-site is sourced from groundwater wells and is independent of mains water. The water requirements of the Site are marginal, with chemical toilets on-site and bottled water supply for welfare. Further, the existing wheel wash on-site is supplied by recycled water and only requires occasional top-ups from the on-site wells. As a result, water supply will remain largely unaffected by climate hazards such as cold snaps, extreme wind or heatwaves. The Site uses an on-site generator to supply energy and is independent of mains electricity. Therefore, in the event of a climate-induced power outage,
	Cold Snaps	2	Minor	
	Heatwave/Drought	2	Minor	
	Extreme Rainfall	1	Negligible	
	Flooding	1	Negligible	

Receptor	Climate Hazard	Impact Score	Classified Asset Impact	Justification
	Wildfires	2	Minor	such as strong winds or heavy snowfall, the power supply would be minimally impacted. The asset damage category of minor is defined as *"an adverse event that can be absorbed by taking business continuity action."*
	Landslides	2	Minor	
Outputs	Severe Wind	2	Minor	Due to the nature of activities associated with the Proposed Development (the processing and extraction of earth material), extreme rainfall, flooding and landslides pose the greatest risk to operational output. Extreme rainfall and flooding have the potential to disrupt supply chains through hindered access to and from the Site. The asset damage category of minor is defined as *"an adverse event that can be absorbed by taking business continuity action."*
	Cold Snaps	1	Negligible	
	Heatwave/Drought	1	Negligible	
	Extreme Rainfall	2	Minor	
	Flooding	2	Minor	
	Wildfires	1	Negligible	
	Landslides	2	Minor	
Transport Links	Severe Wind	3	Moderate	WCC Climate Risk Assessment identifies flooding and extreme rainfall, severe wind and heavy snowfall as having the highest consequence to roads and transport and consequently, transport links associated with the Proposed Development. Due to the infrastructure and the size of the quarry void, however, some excess surface water can be stored in the quarry floor, minimising the impact of extreme rainfall and flooding on internal roads.
	Cold Snaps	2	Minor	
	Heatwave/Drought	1	Negligible	

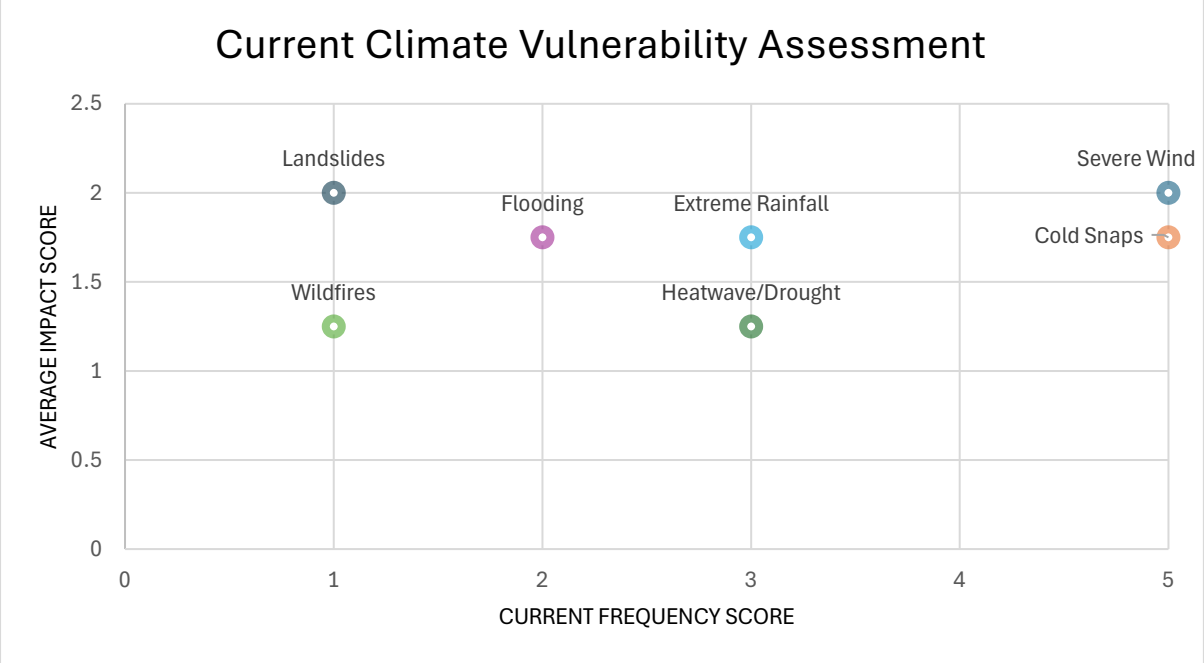
Receptor	Climate Hazard	Impact Score	Classified Asset Impact	Justification
	Extreme Rainfall	2	Minor	Heavy snowfall also disrupts transport links to the Proposed Development, causing delays and higher accident risks, including icy or impassable roads and reduced visibility. Due to their size, larger vehicles are more at risk of accidents in heavy winds. Further, road closures caused by trees or debris will disrupt transport routes. The Proposed Development is optimally located with excellent transport connectivity via the N81 national road, which provides direct access to major motorways, making it more resilient to climate-induced transport disruptions. The asset damage category of minor is defined as *"an adverse event that can be absorbed by taking business continuity action."*
	Flooding	2	Minor	
	Wildfires	1	Negligible	
	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 in Table 10-17 below with an illustrated graph presented in Figure 10-3 below.

Table 10-1717: Summary of Current Climate Impacts for the Hazards Identified

Hazard Type	Current Frequency	Current Frequency Score	Average Impact Score (Across all Receptors)
Severe Wind	Very Frequent	5	2
Cold Snaps	Very Frequent	5	1.75
Heatwave/Drought	Common	3	1.25
Extreme Rainfall	Common	3	1.75
Flooding	Occasional	2	1.75
Wildfires	Rare	1	1.25
Landslides	Rare	1	2

Figure 10-3: Classification of Current Climate Hazards



**Frequency is measured between 1 (Rare) to 5 (Very Frequent). Impact is measured between 1 (Negligible) to 5 (Catastrophic).*

10.4.4 Potential Future Climate Risks

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 10-18 below presents the future changes in climate hazards expected due to climate change, based on a desk-based review of the Climate Ireland platform [117]. As assets are expected to remain similar throughout the operational stage of the Proposed Development, the level of impacts from these hazards will remain the same. For a complete understanding of future climate risks, the CMIP Coupled Model Intercomparison Project ('CMIP') climate

scenarios outlined by Climate Ireland (RCP4.5 and RCP8.5) for the future period 2021-2050 is discussed.

The Climate Ireland platform was used to determine the potential changes in the frequency of these hazards. All climate hazards were assessed relative to the Proposed Development area as far as practicable. This assessment does not include wildfires and landslides due to lack of detailed data for projecting future risks associated with these hazards.

Table 10-1818: Future Changes in Climate Hazards Expected due to Climate Change

Climate Hazard	Current Frequency Description	Future Frequency Description	Justification
Severe Wind	Very Frequent	Very Frequent	According to the EPA updated High-resolution Climate Projections for Ireland published in 2024 [101], *"The seasonal projected changes in the standard deviation of 10-m wind speed show small changes for winter, spring and autumn, with large decreases noted for summer."* Further, *"the mean annual 10 m-wind speed is projected to decrease by 0.7—1.7% for SSP126 (2021–2050)".* These changes are not significant, and therefore, the projected frequency will remain the same.
Cold Snaps	Very Frequent	Very Frequent	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) is expected to increase by 0.15-0.2 days in the period 2021-2050 compared to the period 1976-2005. Under RCP8.5, the number of ice days is expected to increase by 0.15-2 days over the same period. Due to the anticipated increase in the frequency of ice days, the cold snap climate hazard will continue to be classified as "Very Frequent".
Heatwave/Drought	Common	Common	According to the Climate Ireland platform under both RCP4.5 and RCP8.5, the area associated with the Proposed Development is expected to increase by 0.07-0.1 number of heatwaves in 2021-2050 compared to the period 1976-2005. Given that the area associated with the Proposed Development presents a relatively low future frequency for the number of heatwaves, this will remain as "Common".
Extreme Rainfall	Common	Frequent	According to the Climate Ireland platform, under RCP4.5, the number of days where precipitation will exceed 30mm (classified as a "Very Wet Day") is expected to increase by 1.58-2.89 days. Under RCP8.5, the number of very wet days is expected to increase by 1.53-2.84 days. Given this increase under future climate scenarios, the frequency of extreme rainfall has been upgraded to "Frequent."
Flooding	Occasional	Occasional	According to available National Indicative flood maps for future scenarios, modelled future flood

Climate Hazard	Current Frequency Description	Future Frequency Description	Justification
			extents affecting a small portion of the northeastern region of the Site increase slightly in comparison to current extents. However, these do not reach an area beyond the current flood extent and remain at a 1% AEP. Consequently, the projected frequency of future flooding will remain the same.

Figure 10-4: RCP4.5 and RCP8.5 Projected Changes in Number of Heatwaves (2021-2050)

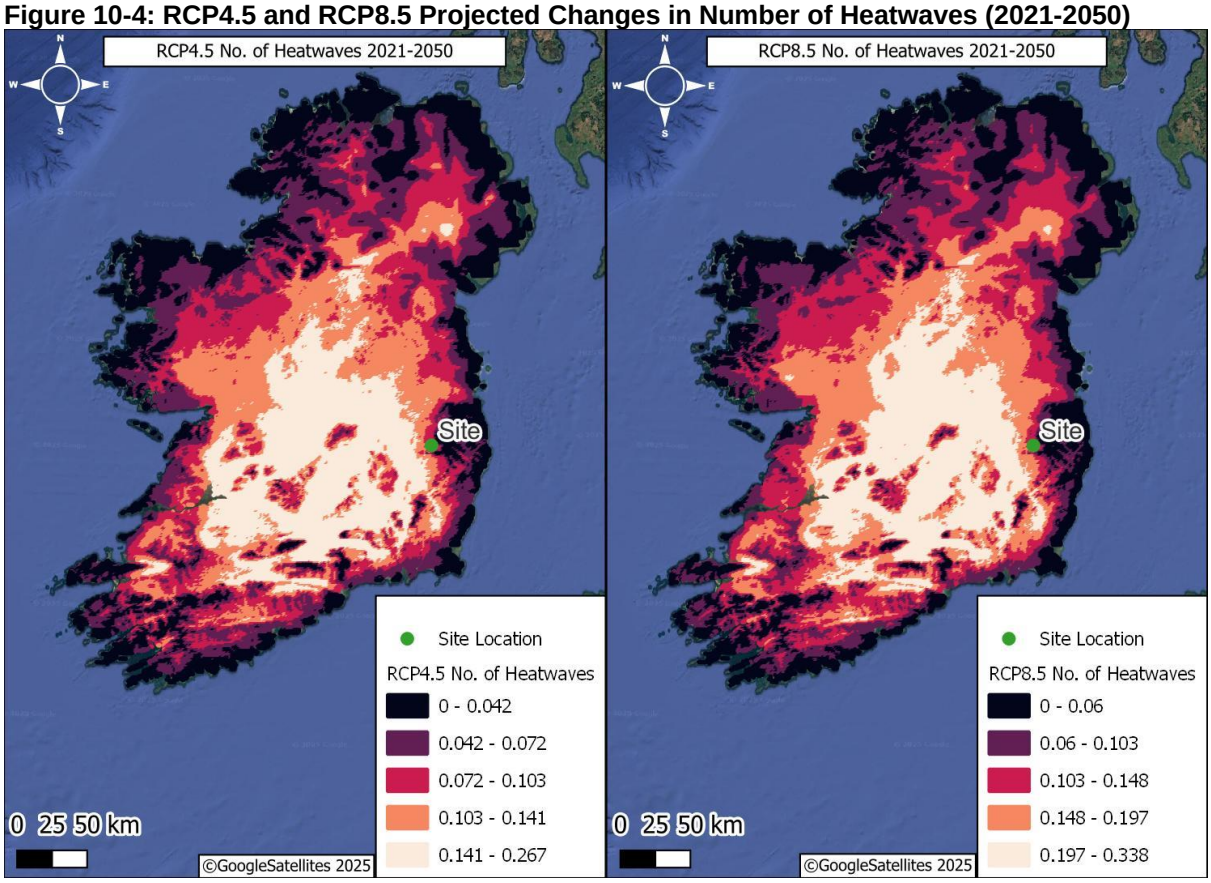


Figure 10-5: RCP4.5 and RCP8.5 Projected Changes in Number of Ice Days (2021-2050)

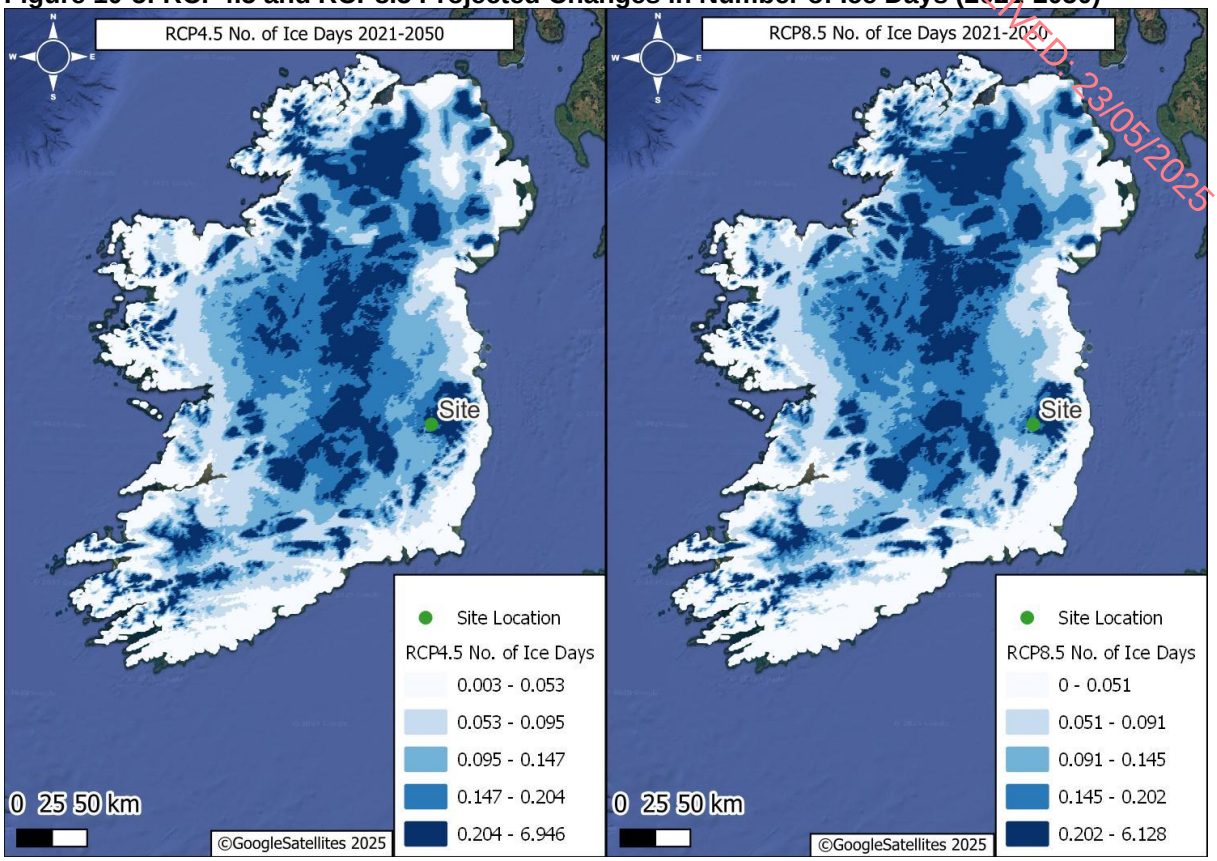


Figure 10-6: RCP4.5 and RCP8.5 Projected Changes in Number of Very Wet Days (2021-2050)

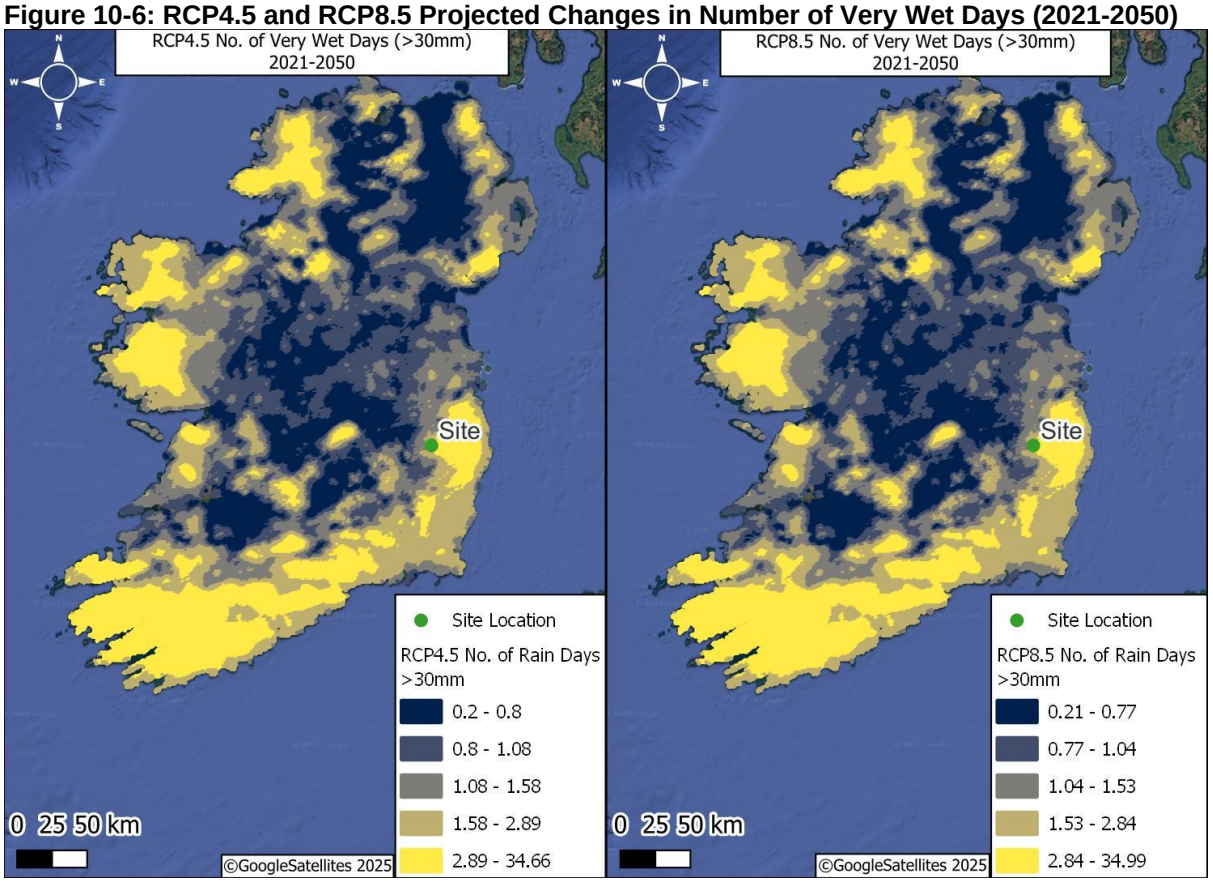
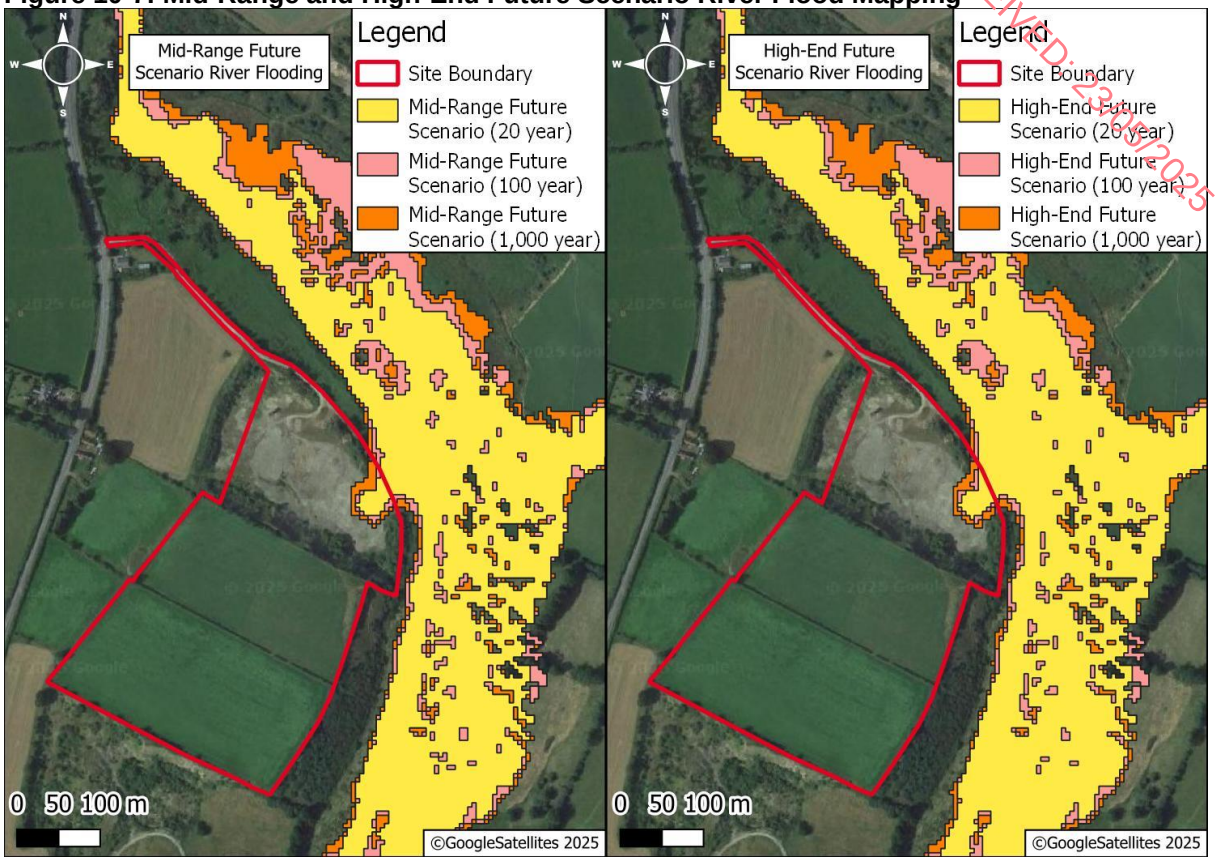


Figure 10-7: Mid-Range and High-End Future Scenario River Flood Mapping



Based on the results of the Climate Vulnerability Assessment, the effects of climate change on the Proposed Development will be 'not likely' and 'not significant'.

10.4.5 Unplanned Events

No unplanned events that would have a major effect on GHG emissions associated with the Proposed Development could occur. The only unplanned event that could cause GHG emissions would be fire and explosion. Given the nature of the Site, there are few combustible materials or ignition sources present, as all plant and equipment will be maintained to a high standard of safety. As such, it was considered very unlikely for fire to occur. If such an event did occur, any emissions would be limited and short-term. Therefore, any potential effect in context of GHG emissions and relevant emissions ceilings will be 'not likely' and 'not significant'.

10.5 Proposed Mitigation Measures

The following mitigation measures will also be implemented during the works associated with the Proposed Development includes:

- Reducing the idle times by providing an efficient material handling plan that minimises the waiting time for loads and unloads;
- Turning off vehicle engines when not in use for more then 5-minutes;
- Regular maintenance of plant and equipment; and,
- The use of low-energy equipment.

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 10.4.2 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 effect 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 the water, which is shown to influence the Proposed Development. The frequency of extreme rainfall events is expected to increase under a 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 can directly impact air quality. However, these emissions are "not significant" and as such air quality will not be negatively impacted; and,
- **Chapter 13 – Traffic:** 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 Residual Effects

In the context of the National Emissions Ceiling and the relevant Sectoral Ceiling, the effects of GHG emissions as a result of the Proposed Development will be 'not significant' based on the quantification presented in this chapter.

10.9 Indirect Effects

All significant and likely effects have been considered in this chapter. No additional indirect effects were identified during this assessment.

10.10 Monitoring

No additional monitoring of GHG emissions is required as part of the Proposed Development.

10.11 Reinstatement

The project is centred around the reinstatement of agricultural lands, which was the original land use prior to the commencement of quarry operations. Due to land change, the Proposed Development may act as a carbon sink in the future. Determining whether an agricultural field acts as a carbon source or sink is challenging due to the complexity of soil carbon dynamics, varying management practices, climate conditions, and the interplay of carbon inputs and losses over time. Such assessment is outside the boundary of this assessment and outside the requirements of an EIA.

10.12 Difficulties Encountered

The quantification of GHG emissions as a result of the Proposed Development was conducted as far as practical with the best available data at the time of writing. Where information was not available, the following assumptions and estimations were made based on the MOR Environmental library of data and professional judgement:

- The effects of GHG emissions as a result of the Proposed Development were calculated based on a conservative estimate of 50km per day (100km round trip) and national commuting data from the CSO 2022 for employee travel; and,
- Due to the limited availability of data, it was not possible to quantify the potential future impacts of wildfires and landslides on the Proposed Development.

11 ACOUSTICS (NOISE AND VIBRATION)

11.1 Introduction

This Chapter of the EIAR provides a description and assessment of the significant and likely impact(s) of noise and vibration from the Proposed Development on the receiving environment.

The following policies relating to the assessment of noise regarding the extractive industry are contained within the CDP [6]:

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:

- The existing ambient and background acoustic / sound environment;
- Quantifying the likely construction, operational and restoration 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 [74];
- EPA 2006, Environmental Management Guidelines, Environmental Management in the Extractive Industry (Non-Scheduled Minerals), 2006 [75];
- Irish Concrete Federation ('ICF') 2005, Environmental Code, Second Edition, October 2005 [98].
- BS5228-1:2009+A1:2014, Code of practice for noise and vibration control on construction and open sites, Noise [126];
- SI No 140/2006 Environmental Noise Regulations 2006 [127];
- ANC Guidelines (Greenbook) Environmental noise measurement guide 2013 [128];
- BS4142:2014+A1:2019: Methods for rating and assessing industrial and commercial sound, 2014 [129];
- IEMA Guidelines for environmental noise impact assessment, 2014 [130];
- ISO 1996-1:2016 Acoustics - Description, measurements and assessment of environmental noise - Part 1: Basic quantities and assessment procedures 2003 [131];
- ISO 1996-2:2017 Acoustics - Description, measurement and assessment of environmental noise - Part 2: Determination of sound pressure levels [132];
- NRA Guidelines for the treatment of noise and vibration in National Road Schemes, 2004 [133];
- NRA Good practice guidance for the treatment of noise during the planning of National Road schemes, March 2014 [134];
- Smith, Peterson and Owens Acoustics and Noise Control, 1996 [135];
- World Health Organization's ('WHO') Night noise guidelines for Europe [136];
- World Health Organization's ('WHO') Guidelines for Community Noise [137];
- Aggregate Levy Sustainability Fund ('ALSF'): Sustainable Aggregates Theme 1 - Reducing the environmental effect of aggregate quarrying: Dust, noise and vibration, year unknown [138].
- Wicklow County Development Plan 2022-2028 [6]; and
- Wicklow Noise Action Plan 2024-2028 [139].

A glossary of acoustic terminology utilised within this report is shown in Appendix 11-1.

This chapter assesses noise impact arising from the Proposed Development through 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') / Institute of Environmental Management and Assessment ('IEMA') guidelines above; and,
- An assessment of 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 for quarries 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 onsite activities can be monitored and noise control implemented. The limits are similar to international criteria for the protection of human health from noise nuisance. These limits will therefore be applied as the criteria within this Chapter for noise impact from the Proposed Development.

11.2.1.1 Site Preparation

Site preparation stage noise will be assessed utilising the British Standard BS5228-1+A1:2014 [126] , 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 the 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: BS5228-1: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 potential 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 environment at Noise Sensitive Receptors ('NSRs') to allocate suitable construction noise limits.

11.2.1.2 Operational Site-Specific Noise

Best guidance for quarry noise control and ancillary activities issued by the DEHLG [74], EPA [75] and Irish Concrete Federation [98] are deemed suitable for this proposed development based on the Site history and type of activities proposed, this detail recommended noise limits of:

- Daytime (i.e. 08:00 to 20:00 indicate) $L_{Aeq,1hr}$ 55dB(A); and,
- 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 for rural areas, which has been prepared for this Site. A modification to the setting of limits at baseline monitoring methods are triggered in 'Quiet Areas'.

In conjunction with the fixed limit compliance, this assessment on noise also utilises the IOA / IEMA 2014 guidance for the assessment of impact. This methodology of the IOA / IEMA Guidelines for Environmental Noise Impact Assessment [119] have been followed. Figure 11-1 below presents the relationship between noise impact and noise effect in generating an understanding of significance from the change to an acoustic environment.

In forming an assessment on the impact, this methodology looks at the following key elements:

- The change from the baseline presented by the Proposed Development;
- Type of noise source;
- Nature of the change; and,
- Other factors.

The guidance further identifies that the impact assessment should consider the following influences:

- Averaging period;
- Time of day;
- Nature of the noise source (intermittency, etc.);
- Frequency of occurrence;
- Spectral characteristics;
- Absolute level of the noise indicator; and,
- Influence of the noise indicator used.

Figure 11-1: IEMA IOA Chart on Magnitude, Significance and Effect

MAGNITUDE (Nature of Impact)		DESCRIPTION OF EFFECT (on a specific sensitive receptor)	SIGNIFICANCE (as required within EIA)
Substantial	BENEFICIAL	**Receptor perception = Marked change** Causes a material change in behaviour and/or attitude, e.g. individuals begin to engage in activities previously avoided due to preceding environmental noise conditions. Quality of life enhanced due to change in character of the area.	More Likely to be Significant (Greater justification needed – based on impact magnitude and receptor sensitivities – to justify a non-significant effect)
Moderate	BENEFICIAL	**Receptor perception = Noticeable improvement** Improved noise climate resulting in small changes in behaviour and/or attitude, e.g. turning down volume of television; speaking more quietly; opening windows. Affects the character of the area such that there is a perceived change in the quality of life.	↕
Slight	BENEFICIAL	**Receptor perception = Just noticeable improvement** Noise impact can be heard, but does not result in any change in behaviour or attitude. Can slightly affect the character of the area but not such that there is a perceived change in the quality of life.	(Greater justification needed – based on impact magnitude and receptor sensitivities – to justify a significant effect) Less Likely to be Significant
Negligible		N/A = No discernible effect on the receptor	**Not Significant**
Slight	ADVERSE	**Receptor perception = Non-intrusive** Noise impact can be heard, but does not cause any change in behaviour or attitude, e.g. turning up volume of television; speaking more loudly; closing windows. Can slightly affect the character of the area but not such that there is a perceived change in the quality of life.	Less Likely to be Significant (Greater justification needed – based on impact magnitude and receptor sensitivities – to justify a significant effect)
Moderate	ADVERSE	**Receptor perception = Intrusive** Noise impact can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; closing windows. Potential for non-awakening sleep disturbance[81]. Affects the character of the area such that there is a perceived change in the quality of life.	↕
Substantial	ADVERSE	**Receptor perception = Disruptive** Causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in character of the area.	(Greater justification needed – based on impact magnitude and receptor sensitivities – to justify a non-significant effect) More Likely to be Significant
Severe	ADVERSE	**Receptor perception = Physically Harmful** Significant changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Significant

11.2.2 Site Associated Road Traffic

The Proposed Development will utilise the existing access through the N81 national secondary road and the internal local access road, which connects the existing site entrance to the N81.

The Site is bounded by the N81 to the west. As a result, the existing infrastructure will be used for accessing the area corresponding to the Proposed Development. HGVs will travel via the N81 to access the Site, with return trips following the same route.

Proposed Whitestown Quarry associated traffic is constrained to operational daytime hours, removing any associated road traffic noise during the night-time period.

Accordingly, this Chapter has not identified significant and likely impacts arising from the Proposed Development for road traffic noise on the national road network and it has therefore been screened out of further assessment.

Vehicular traffic within the Site have been incorporated to the noise model – refer to Chapter 13 for the basis of Site traffic numbers.

11.2.3 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. Source sound values were populated utilising the in-house MOR Environmental source library, consisting of measured sources from similar facilities and the SourceDB provided with the iNoise software package. The modelling inputs and outputs are presented in Appendix 11-2.

11.3 Receiving Environment

A review of the locality was conducted utilising OSI online mapping, Google and Bing Aerial Photography. In addition, a GIS layout was developed plotting known homes and businesses utilising the Geo-directory database.

Based on this research, NSRs were identified in the locality and are shown in Figure 11-1 and described in Table 11-2. During the Site survey a visual check of the locality was completed to identify any new NSRs, or any older buildings demolished, or changed in-use.

From this dataset, NSRs for consideration within this chapter were identified, and used for proxies for all sensitive receptors within the study area. Based on this research, the selected NSRs were identified in the locality and are shown in Figure 11-1 and described in Table 11-2.

All sensitive receptors within the study area are assessed within the acoustic model and details on predicted noise from the Proposed Development are presented within the modelling data in Appenidx 11-2.

Figure 11-2: NSRs location

Table 11-2: Identification of NSRs

NSR ID	Location Relevant to Site	Easting (ITM)	Northing (ITM)	Distance to Site Boundary (m)
NSR01	Residential dwelling located to the north of the Site.	691181	696244	ca.23m
NSR02	Residential dwelling located to the west of the Site.	691083	696084	ca.197m
NSR03	Residential dwelling located to the west of the Site.	691126	696010	ca.141m
NSR04	Residential dwelling located to the south-west of the site.	690894	695586	ca.259m
NSR05	Residential dwelling located to the east of the Site.	691648	695443	ca.342m
NSR06	Residential dwelling located to the east of the Site.	691937	695891	ca.427m

The Site is in an agricultural area, ca. 2km southwest of Donard Town.

The N81 runs south to north, and there is one agricultural field west of the Site. Residential housing is located along the N81 to the south, west and north of the Site, with further residential housing located to the east of the site along the local Donard Mountain road and

further west, ca 650m on the L8314 local road. Several farm holdings are also present in the locality.

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.

NG4 identifies a specific screening mechanism for Quiet Areas, and the screening process is shown in Table 11-3.

Table 11-3: Screening for Quiet Area

Parameter	Quiet Noise Criteria Distance	Criteria Met	Note
Distance to urban area with population >1,000 persons.	>3km	Yes	No distance urban area within the criterion.
Distance to urban area with population >5,000 persons.	>10km	Yes	
Distance to urban area with population >10,000 persons.	>15km	Yes	
Distance to local industry (small or individual activities).	>3km	No	Local timber manufacturing industry southwest 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. 50m west of the Site Boundary.
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 whether the locality is at distance to select human noise emission sources. Therefore, it is always necessary to monitor the local environment.

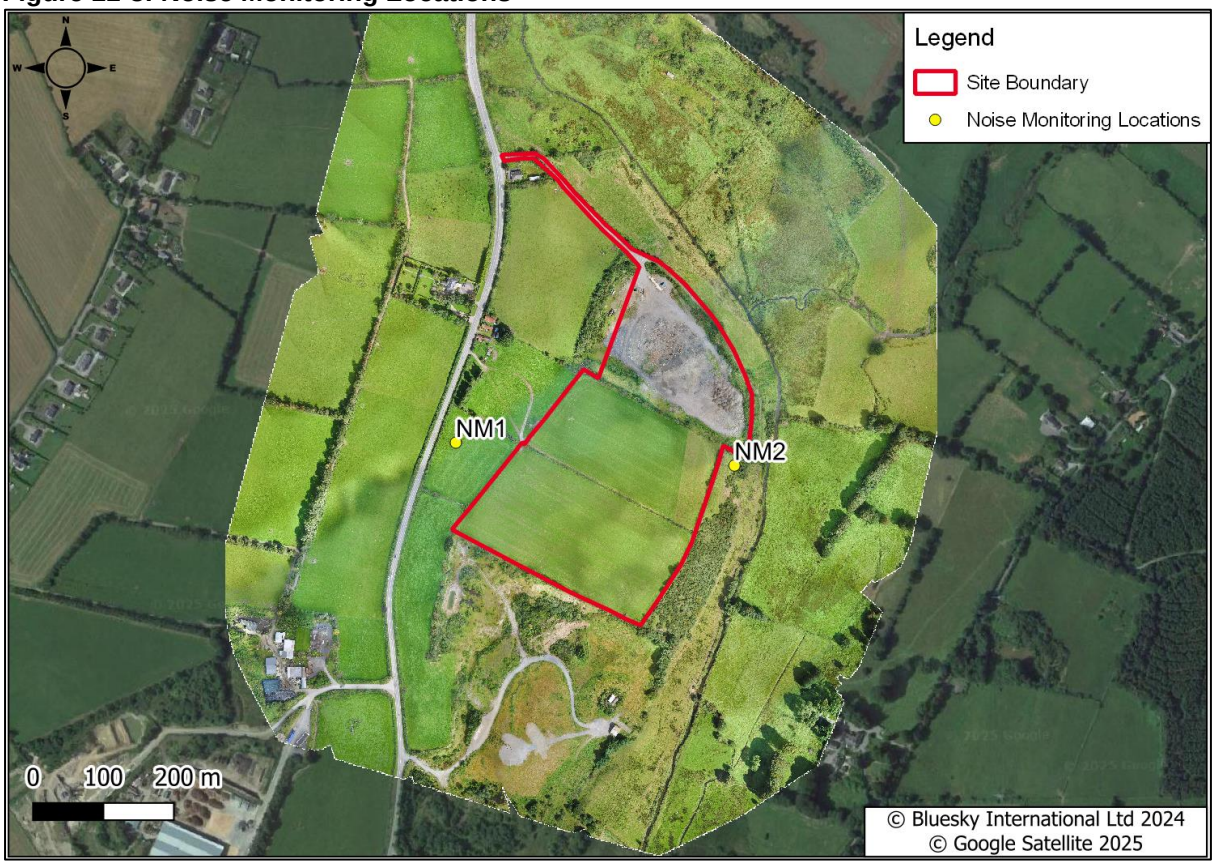
11.3.3 Baseline Ambient Acoustic Environment Survey

A noise survey was undertaken on the 2nd November 2023 to establish the baseline ambient sound levels at surrounding NSRs. Monitoring locations are identified as boundary or proxy locations to NSRs in Table 11-4 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 11-4: Noise Monitoring Locations

Monitoring Point	Easting	Northing	Description
NM1	691090	695863	Located to the west of the Site, near N81.
NM2	691486	695831	Located to the east of the Site.

Figure 11-3: Noise Monitoring Locations



11.3.3.1 Competent Person

The monitoring and analysis of the data was conducted by a MOR Environmental Principal and Associate Director of acoustics. This monitoring programme, data and report was directed and reviewed by a full member of the Institute of Acoustics ('MIOA') and a member of the Association of Acoustic Consultants of Ireland ('AACI') with over 15+ years' experience in environmental and acoustic consultancy.

11.3.3.2 Measurements

Two noise monitoring locations were used (NM1 and NM2) to characterise local ambient sound levels. The measurements were attended and included two rounds of 30-minute measurements at each monitoring location.

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 meters over ground level.

11.3.3.3 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 XL3 Audio Acoustic Hand-held Analyser SLM.

The SLM was field calibrated utilising a:

- Larson Davis CAL 200 field calibrator.

The Larson Davis calibrator 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 SLM and the Larson Davis field calibrator are available upon request.

11.3.3.4 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 Oak Park, Carlow, ca. 24km southwest of the Site. The summary of the Met Éireann weather data from this synoptic station on the day of the monitoring event is shown in Table 11-5. Hourly weather data is described in Appendix 11-3.

Table 11-5: Met Éireann Summary for Casement Weather Station

Date	Rainfall (mm)	Max Temp °C	Min Temp °C	Mean Wind Speed (Knots)	Maximum Gusts (if >knots)
02/11/2023	0.2	11.5	5.4	8.4	N/A

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 the 2nd November 2023. The monitoring results of the ambient acoustic environment survey undertaken is detailed below in Table 11-6. One-third octave frequency charts and plates of the monitoring locations are attached in Appendix 11-4.

Table 11-6: Daytime Noise Monitoring Results 2nd November 2023

NM	Start Time	Elapsed Time	$L_{Aeq,T}$ (dB)	L_{AFmax} (dB)	$L_{AF90,T}$ (dB)	Commentary
NM1 Run 1	09:30	30:00	58	74	37	Traffic on the N81 (W) dominant. 5-minute traffic count: 09:38-09:43= 14 vehicles passings. Truck passes on the N81 on seven occasions during the overall measurement. Plane audible (N) on two occasions. Birdsong audible throughout. Wind speed: 0-3m/s
NM1 Run 2	10:07	30:00	56	74	37	Traffic on the N81 (W) dominant. 5-minute traffic count: 10:20-10:25= 12 vehicles passings. Truck passes on the N81 on nine occasions during the overall measurement. Tractor pass on one occasion on the N81. Plane audible (S) on one occasion. Birdsong audible throughout. Wind speed: 0-3m/s
NM2 Run1	11:17	30:00	47	70	41	Traffic on the N81 (W) dominant. Birdsong audible. Cattle audible near the SLM at 11:18-11:23. The L_{AFmax} peak is associated with vocalizations made from the cattle near the SLM. Distant HGV movements audible on multiple occasions. Wind speed: 0-3m/s
NM2 Run 2	11:47	30:00	46	58	41	Traffic on the N81 (W) Dominant. Birdsong audible. Wind speed: 0-3m/s

11.3.4 Characterisation of the Ambient Acoustic Environment

The ambient sound survey found that the local ambient acoustic environment was influenced by:

- Transport – traffic noise from the N81; and,
- Agriculture – domestic animals such as cattle, along with bird song and bird call.

Higher levels of ambient acoustic sound were found within proximity to the N81 Road. Although the N81 is not a major road, as per the Environmental Noise Regulations, TII traffic counter 000000020811 - TMU N81 040.0 N, located ca 3.1km due north of the Site entrance, reports a weekday average of 4,601 vehicles per day, with a 5.2% to 5.7% HGV.

All monitoring locations recorded averaged $L_{Aeq,T}$ values of 46dB to 58dB during daytime hours. The background ambient acoustic environment for all monitoring locations, as L_{A90}, ranged from 37dB to 41dB during daytime hours.

11.3.5 Conclusion of Existing Ambient Acoustic Environment

Based on the desk-based review of the area and the baseline survey carried out by MOR Environmental, it is reasonable to conclude that the ambient existing sound levels surrounding the Site are typical for a rural environment in proximity to a busy road (N81).

11.4 Characteristics and Potential Effects of the Proposed Development

The potential for noise arising from the Proposed Development has three distinct stage–

- Site Preparation;
- Operational; and,
- Restoration.

The activities associated with Site preparation are outlined below in Section 11.4.1. As the development will be phased during its operation, refer to Section 3.4 above, aspects of Site preparation will occur simultaneously with Site operational works, and therefore, the Site preparation stage is assessed against the operational noise nuisance levels in such cases.

Two acoustic models have been prepared to assess the noise arising from the Proposed Development and represent the worst-case scenarios during its life.

The sources and potential impacts arising from the phases are distinctly different and therefore have been discussed separately.

11.4.1 Site Preparation Noise

Noise during Stage 1 will consist mainly of the following:

- Removal of soils and topsoils by bulldozer or similar unit and the material transport by loading shovel and dump truck; and,
- Restoration of old quarry lands as per the Proposed Development layout and short-term storage of soils on site in stockpiles or berms for future restoration works.

The Site preparation works will require the use of a bulldozer, loading shovel and dump truck on the field ground level and the excavator and/or loading shovel within the deposition area.

Table 11-7 below gives typical sound pressure levels ($L_{Aeq,T}$) for typical equipment employed for such works. The Site Preparation Stage will be completed in phase as required to develop new resources. Each event will typically expose up to 0.4ha (1 acre) taking approximately 6-8 weeks to complete.

Table 11-7:Site Preparation Stage Sound Pressure Levels

Plant	Description	Sound Pressure L_{Aeq} at 10m	Combined Sound Pressure, at 10m, $L_{Aeq,T}$ dB
Bulldozer	Clearing of soils	75	79
Excavator	Creation of ramps	77	

An assessment of the noise exposure associated with the plant identified in Table 11-7 above has been undertaken. The methodology assessed sound attenuation over distance, based on the methodologies of BS5228-1 and ISO 9613, for the distance attenuation of sound.

Table 11-8 below details the predicted construction noise impacts at NSRs utilising BS5228 ABC Method for maximum noise associated with Site Preparation ($L_{Aeq,T}$ of 79dBA).

A construction noise impact assessment was undertaken for all NSRs in proximity to the Proposed Development.

Table 11-8: Summary for the Site Preparation activities

NSR	Distance to Main Construction Site (m)	Predicted Site Specific Sound Pressure Level at NSR Facade $L_{Aeq,T}$ dB	Measured Ambient Sound Pressure Level $L_{Aeq,T}$	Combined Noise Level (Predicted + Measured Ambient $L_{Aeq,T}$)	65dB Threshold Compliant for main Site
NSR01	301	50	56	57	Compliant
NSR02	240	52	56	57	Compliant
NSR03	141	56	56	59	Compliant
NSR04	259	51	56	57	Compliant
NSR05	342	48	46	50	Compliant
NSR06	427	47	46	49	Compliant

The proposed site preparation works will be within standard limits for prevention of construction-related noise nuisance, as outlined in BS5228-1 of a $L_{Aeq,1hr}$ of 65dB.

The primary construction activities will be short duration, occurring over a discrete period of ca. 3 months. As such, construction stage noise is deemed a short-term, negligible impact.

11.4.2 Site Preparation Vibration

No Site Preparation Stage vibration is likely.

11.4.3 Operational Noise

The operational stage will comprise of the removal of the sands and gravel aggregates and their on-site transport to the on-site screening plant within the quarry pit floor. The Proposed Development will utilise existing haul routes from the national road, through the existing permitted waste facility permit development to access the extension lands.

Table 11-9 below gives typical sound pressure ($L_{Aeq,T}$) values for plant utilised in quarry restoration sites for each of the steps.

Table 11-9: Operation Sound Pressure Levels

Model ID	Plant	Description	BS5228 Reference [126]	Sound Pressure L_{Aeq} at 10m
01, 02	Lorry / HGV	4 Axle truck movement onsite	C.2.34	80
01, 02	Bulldozer	Transporting soils	C.2.11	79
01	Loading shovel	Wheeled loader	NA	87
01, 02	Dump truck	Transporting	C10.19	87
01, 02	Dry Screening Plant	Dry Screening plant	NA	72
02	Wheeled Excavator	Excavations settlement pond	C4.10	66
02	Wet Screening Plant	Wet Screening Plant	NA	72
02	Crane	Mobilise equipment	C4.38	78
02	Generator	Diesel Generator	C6.39	65

There are two operational models for the Proposed Development as presented below:

- Model 01 – Plant listed in Table 11-9 at 153mAOD operating simultaneously; and,
- Model 02 – Plant listed in Table 11-9; the operational plant located to the southern area upper bench at 153mAOD. Activities also occurring within Phase 2 to develop the settlement pond and generator building at 143mAOD. The washing plant is operational in the pit floor of Phase 2, at 143mAOD. As a worst-case scenario, the operational plant (generator and the wet screening plant) have also been included.

The project design includes the leaving in-situ of the eastern, southern and western ground levels, and the leaving in-situ of the majority of the northern boundary existing ground levels, with the exception of the proposed access route into the aggregate reserve. These will offer visual and acoustic screening to all works within the Site.

Additionally, the predicted change is the worst-case scenario for the Proposed Development, 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 boundary elevation and NSRs.

11.4.3.1 Model 01 – 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 Stage of Model 01 and against EPA & DEHLG limit ($L_{Aeq,T}$ 55dBA) in Table 11-10, with Figure 11-4 showing daytime contours.

Figure 11-4: L_{day} noise contours for Model 01

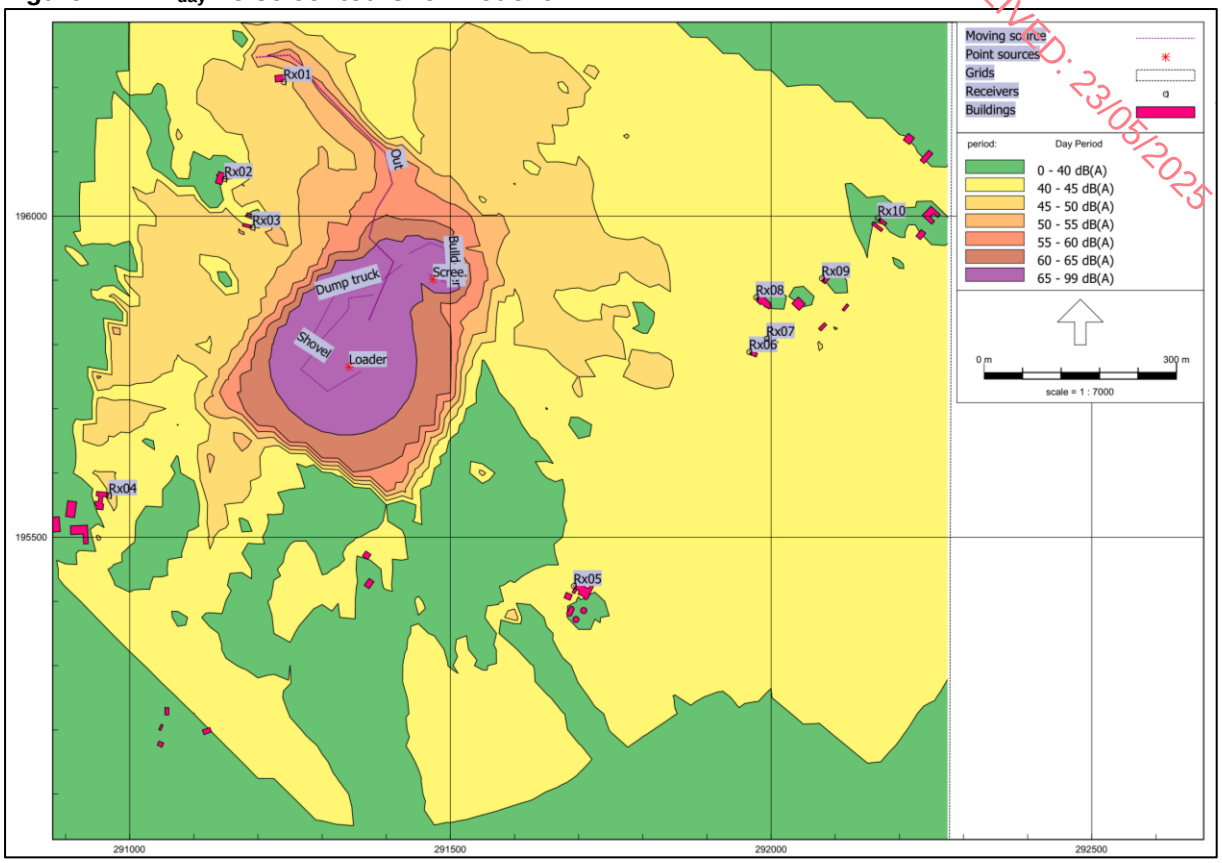


Table 11-10: Operational Noise Assessment Model 01

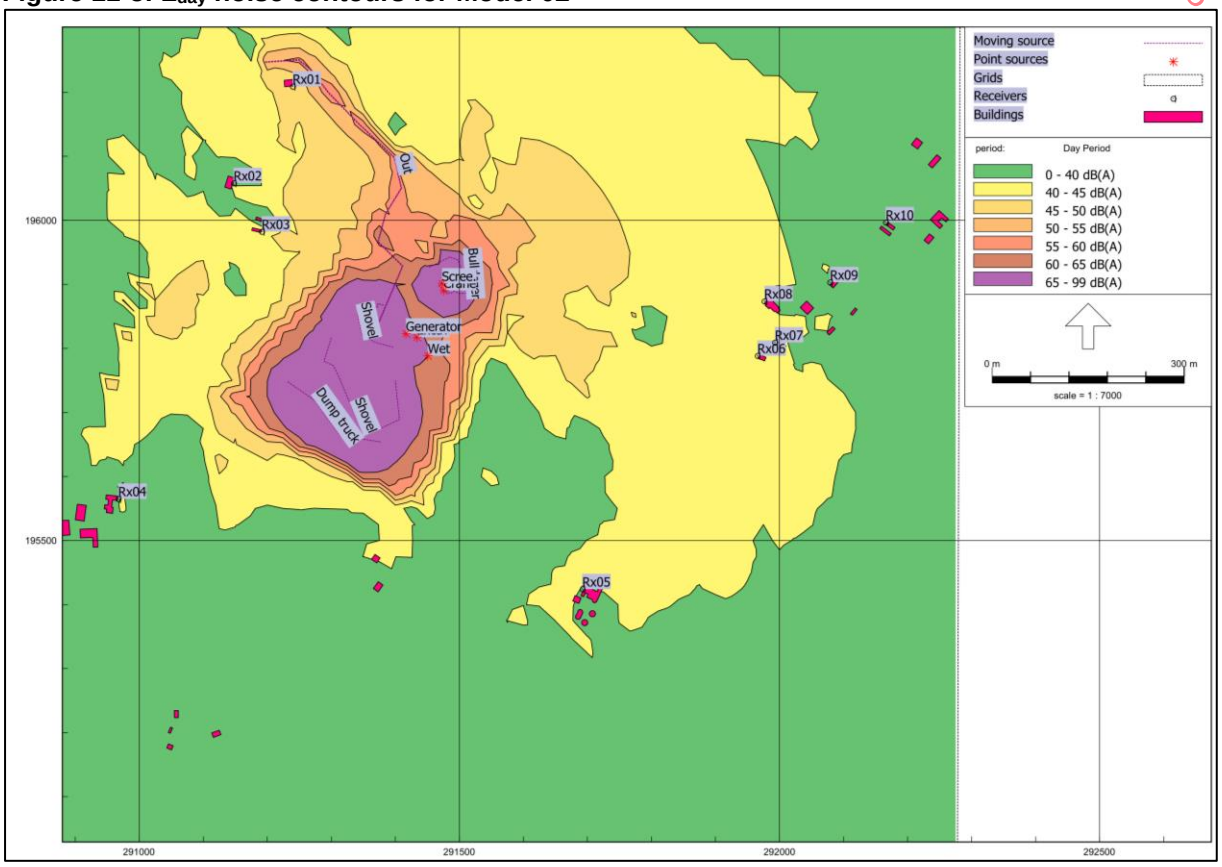
NSR	Model Output $L_{Aeq,1hr}$ (dB)	Ambient Measured $L_{Aeq,1hr}$ (dB)	Ambient Measured $L_{A90,1hr}$ (dB)	Predicted Cumulative (Model + L_{A90}) (dB)	EPA & ICF L_{Aeq} Limit (dB)	Complaint?
NSR01	49	56	37	50	55	Yes
NSR02	40	56	37	42		Yes
NSR03	50	56	37	50		Yes
NSR04	40	56	37	42		Yes
NSR05	43	46	41	45		Yes
NSR06	43	46	41	45		Yes

Table 11-10 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 NSR03 to the southwest, with $L_{Aeq,T}$ value of 50dBA, which is substantially lower than existing measured general noise for NSRs in proximity to the national road, $L_{Aeq,30min}$ 56dBA.

11.4.3.2 Model 02 - 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 Stage of Model 02 and against EPA & DEHLG limit ($L_{Aeq,T}$ 55dBA) in Table 11-11, with Figure 11-5 showing daytime contours.

Figure 11-5: L_{day} noise contours for Model 02



These values are a worst-case scenario and demonstrate that the Proposed Development will operate in compliance.

Table 11-11: Operational Noise Assessment Model 02

NSR	Model Output $L_{Aeq,1hr}$ (dB)	Ambient Measured $L_{Aeq,1hr}$ (dB)	Ambient Measured $L_{A90,1hr}$ (dB)	Predicted Cumulative (Model + L_{A90}) (dB)	EPA & ICF L_{Aeq} Limit (dB)	Complaint?
NSR01	46	56	37	47	55	Yes
NSR02	37	56	37	40		Yes
NSR03	46	56	37	46		Yes
NSR04	34	56	37	39		Yes
NSR05	43	46	41	45		Yes
NSR06	42	46	41	44		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 NSR01 and NSR03 to the west, with $L_{Aeq,T}$ value of 46dBA.

Activities likely to result in audible noise at NSRs will normally only occur during daytime hours. As such, receptor positions are assessed to ground floor only for the daytime assessment.

Furthermore, the predicted cumulative sound level will be in-line or significantly below existing monitored ambient measurements locally, refer to Table 11-10 and 11-11 above, $L_{Aeq,T}$ values.

Based on the modelling completed, and the cumulative predicted sound levels at receptors, as presented in Table 11-10 and 11-11 above, the predicted impact is deemed to be not significant medium-term impact on a local basis, prior to mitigation.

11.4.4 Operational Vibration

No Operation stage vibration is likely.

11.4.5 Restoration Noise

Noise during the restoration of the Site will be associated with the following:

- Seed planting; and,
- Setting of hedgerows.

This stage of the Proposed Development will be a low intensity and short-term activity associated with the final works within the Proposed Development; as such, typically this stage of works is assessed similarly to construction works.

Key activities include:

1. Disassembly and off-site removal of all plant;
2. Removal of all semi-mobile plant and equipment (wet and dry screeners);
3. Removal of all machinery;
4. Emptying of the oil interceptor by a competent and authorised (by NWCPO) hazardous wate operator;
5. Removal of pumps and pipes associated with on-site water management;
6. The de-silting of the on-site settlement ponds – these ponds will be left in-situ for future biodiversity benefit;
7. Spreading of soils across the pit floor, to a depth of ca. 0.3m, and the planting of these soils; and,
8. Checking of all boundary planting and the inclusion of planting as per the restoration plan.

This activity will require minimal plant, consisting of an agricultural tractor to spread seeds. Table 11-12 below gives typical sound pressure ($L_{Aeq,T}$) values for plant utilised in quarry restoration sites for each of the steps.

Table 11-12: Restoration Sound Pressure Levels

Activity	**Plant**	**Description**	**BS5228 Reference** [126]	**Sound Pressure L_{Aeq} at 10m**
Restoration	Tractor	Spreading seeds – towing equipment	C.4. 74	71

The predicted site-specific emissions from the Proposed Development at the closest NSRs to the main Site, NSR02 and NSR03, are calculated at 43dBA, which is lower than measured

ambient values of $L_{Aeq,30min}$ of 56dBA measured by MOR Environmental in proximity to this NSR and significantly lower than typical construction stage noise limits of $L_{Aeq,1hr}$ of 65dBA, refer to Section 11.2.1.1.

Plant and equipment will be operating at distinct tasks around the Site, where noise emissions will be dispersed. Therefore, to enable a calculation of the likely worst case for audible noise, the activity was assumed to occur at the boundary, while distances to NSRs were calculated from the closest boundary.

The Proposed Development will not introduce new sound characteristics, nor will the restoration project present sound qualities typically deemed to be objectionable, such as tonal or clearly impulsive / impact sounds.

Based on the assessment, the predicted impact during restoration is deemed to be slight medium-term impact on a local basis, prior to mitigation.

11.4.6 Restoration Vibration

No Restoration Stage vibration is likely.

11.5 Proposed Mitigation Measures and / or Factors

The mitigation measures for the site preparation, site operation and site restoration are outlined below in terms of noise. No impacts have been considered likely and significant relating to vibration, and as such, mitigation measures for vibration have not been proposed.

11.5.1 Site Preparation Noise

Prior to commencing development of the Site, a Construction Environmental Management Plan ('CEMP') will be prepared and agreed with the Local Authority. This will identify common noise control measures to be in place during the construction stage of the project as outlined below:

- Construction stage hours will be restricted to 07:00 to 18:00 Monday to Friday inclusive and between 07:00 to 13:00 hours on Saturdays;
- Nomination of a responsible person to accept and respond to complaints;
- Ensuring all plant and equipment is serviced and in good repair;
- Inclusion of response procedure to noise complaints and noise breaches;
- Planning of works to ensure drop heights from equipment are minimised to reduce noise generated; and,
- Avoidance of plant or equipment left idling.

The Site Preparation Stage will be constrained to a period of three months per event.

11.5.2 Operational Noise

Plant operating hours will be from 08:00 to 18:00, Monday to Friday and 08:00 to 14:00 Saturdays. No activities will take place on Sundays or Public Holidays.

The equipment associated with the Operational Stage will be mobile during the operational lifetime within the Site. This will aid in reducing noise emissions from the operations onsite to any individual receptor. The washing plant is proposed to be in a relatively fixed position throughout the life of the Operational Stage.

The following mitigation measures will be in place as part of the Proposed Development:

- All plant (fixed and mobile) is maintained to a high standard to reduce any tonal or impulsive sounds;

- Vehicle speeds will be kept below 15km/hr within the Site;
- All plant is throttled down or switched off when not in use; and,
- Internal routes are reduced in gradients and routed to minimise noise emissions from vehicles onsite.

Incorporating the above measures, and the mobile nature of the project works within the Site, the compliance at NSRs will be a noise criterion of:

- $L_{Aeq,30min}$, 55dB from 08:00 to 18:00.

11.5.3 Restoration Noise

Plant operating hours will be from 08:00 to 18:00, Monday to Friday and 08:00 to 14:00 Saturdays. No activities will take place on Sundays or Public Holidays.

The equipment associated with the Restoration will be mobile during the operational lifetime within the Site. This will aid in reducing noise emissions from the operations onsite to any individual receptor.

The following mitigation measures will be in place as part of the Proposed Development:

- All plant (fixed and mobile) is maintained to a high standard to reduce any tonal or impulsive sounds; and,
- All plant is throttled down or switched off when not in use.

Incorporating the above measures, and the mobile nature of the project works within the Site, the compliance at NSRs will be complied with to a noise criterion of:

- $L_{Aeq,30min}$, 55dB from 08:00 to 18:00,

11.6 Cumulative and In-combination Effects

There is an on-going planning application, ca. 450m to the east of the Site (Planning Ref. 2560046). NSR04 and NSR05 are also include in that application. A cumulative assessment have been conducted with the operational levels showed in the application as worst-case scenario, and the predicted cumulative noise levels are below the 55dBA $L_{Aeq,T}$ typical daytime limit.

Existing noise emissions are incorporated to the ambient noise values utilised in this assessment. The notable developments presented in Figure 1-4 within 2km from the Proposed Development have been considered and there will be no impact based on the proximity, local area and activities.

The Proposed Development has been assessed in relation to the potential variation in ambient noise levels and found that any potential impacts that might occur would be not significant.

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.

- Chapter 5 - Population and Human Health: 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;
- Chapter 6 – Biodiversity: Noise can influence fauna, through disturbance of animals, and impacts on specific species have been outlined in Chapter 6 (Biodiversity) where relevant; and,

- Chapter 13 – Traffic: Noise can be generated from traffic movements. However, the assessment undertaken in Chapter 13 determined that there would be a "negligible" impact from traffic.

11.8 Indirect Effects

All significant and likely effects 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 Negligible negative, local and reversible during the main operational stage of works.

The Proposed Development will be subject to, and has been modelled to show, it can comply with, noise limits for the construction, operation and restoration stages.

11.10 Monitoring

General activities onsite will be acoustically monitored on a bi-annual basis at a minimum of three locations, with a site-specific noise limit, measured at NSR's of:

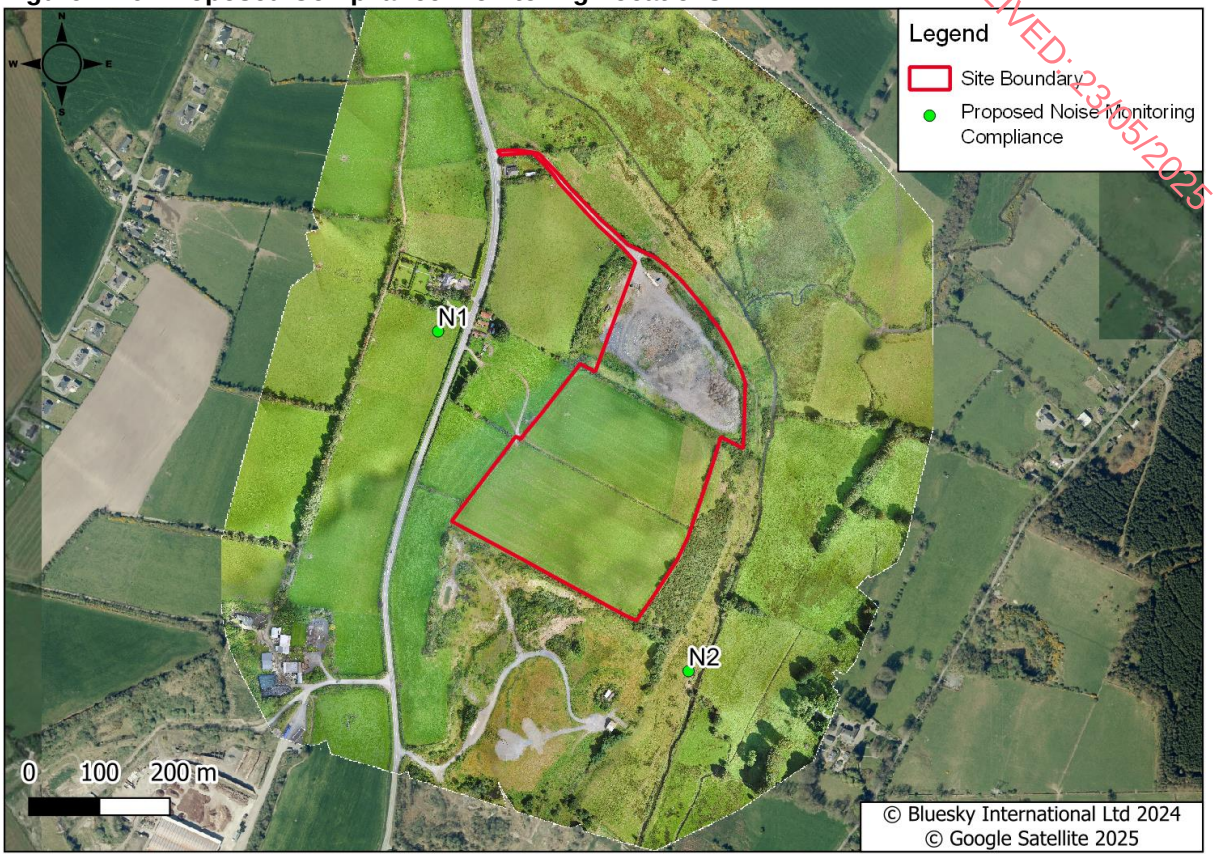
- Daytime $L_{Aeq,1hr}$, 55dB.

Normal operations in the Site will not operate during the evening or night-time period, therefore monitoring has not been specified for these periods. However, in the event out of hour works are required – tighter limits, as presented in Section 11.2.1.2 are applicable.

Any tonal or impulsive characteristics of the site-specific noise emissions, during the day or evening periods, 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 with the Competent Authority in advance. The results of the monitoring shall be submitted to the Competent Authority. Proposed monitoring positions identified as N1 and N3 are shown below in Figure 11-6.

Figure 11-6: Proposed Compliance monitoring Locations



11.11 Reinstatement

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

11.12 Difficulties Encountered

There were no difficulties encountered.

12 CULTURAL HERITAGE

12.1 Introduction

This Chapter of the EIAR, commissioned by MOR Environmental on behalf of Mr. James & Mr. Thomas Metcalfe, addresses the effects on the archaeological, architectural and cultural heritage of the application area, and the surrounding area, of a proposal to extend a former sand and gravel pit in Whitestown Lower townland, County Wicklow.

12.2 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 set out below is drawn from the 2022 EPA Guidelines (Table 12-1).

Table 12-1:The Criteria and definitions for describing effects set out for the 2022 EPA Guidelines.

Effects	Description and Definition
Quality of Effects	Positive A change which improves the quality of the environment.
	Neutral No effects or effects that are imperceptible, within normal bounds or variation or within the margin of forecasting error.
	Negative/adverse Effects A change which reduces the quality of the environment.
Significance of effects	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 that alters the character of the environment in a manner that is consistent with existing & emerging trends.
	Significant effects An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
	Very Significant effects 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 obliterates sensitive characteristics
Describing extent & context of effects	Extent Describe area size, number of sites & population proportion affected by an effect.
	Context Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions.
	Likely effects

Effects	Description and Definition
Describing probability of effects	The effects can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
	Unlikely effects The effects can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Describing duration, frequency of effects	Momentary effects Effects lasting from seconds to minutes.
	Brief effects Effects lasting less than a day.
	Temporary effects Effects lasting less than a year.
	Short-term effects Effects lasting one to seven years.
	Short-term effects Effects lasting seven to fifteen years.
	Long term-term effects Effects lasting fifteen to sixty years.
	Permanent effects Effects lasting over sixty years.
	Reversible effects Effects that can be undone, for example through remediation or restoration.
	Frequency of effects Describe how the effect will occur.
Describing types of effects	Indirect effects Impacts on the environment which are not a direct result of the project.
	Cumulative effects The addition of minor or significant effects, including effects of other projects, to create a larger more significant effect.
	'Do Nothing Effects' The environment as it would be in the future should the project not be carried out.
	'Worst case' effects The effects arising from a project 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.
	Residual effects Degree of environmental change occurring after mitigation measures take effect.
	Synergistic effects Where the resultant effect is of greater significance than the sum of its constituents.

12.2.1 Baseline Studies

The baseline study research has been undertaken in two phases: the paper study phase and subsequently the field inspection phase.

Paper Study

The first phase comprised a paper survey of all available archaeological, historical, and cartographic sources. This involved the following:

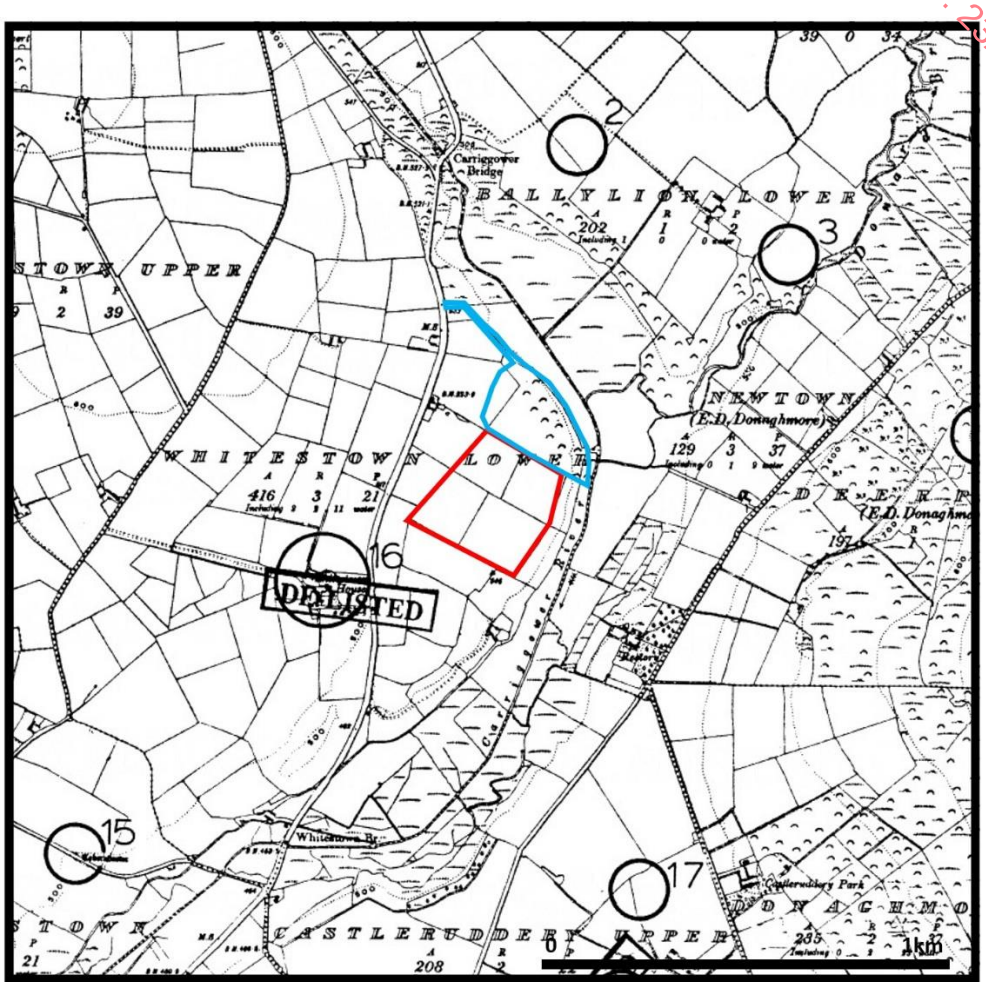
- A collation of existing written and graphical information to identify the likely context, character, significance and sensitivity of the known or potential cultural heritage, archaeological and structural resource using appropriate methodology;
- a detailed investigation of the archaeological and historical background of the Site, the landholding and the surrounding area extending 1km from the development boundary (Figure 12-1). 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 Wicklow County Development Plan 2022-2028: 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. Note that although the Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023 was signed into law by the President on October 13, 2023, the act had not been commenced at the time this assessment was prepared. This assessment uses the National Monuments Acts 1930-2014, which were still in force at the time the assessment was completed;
- The Sites and Monuments Record – these are 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 17th 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 12-1: The assessment study area is superimposed on the RMP map for County Wicklow. The application area is outlined in red, and the former sand and gravel pit in blue. RMP sites are indicated with black circles.



Field Inspection

- A field inspection was carried out on the 25th of January 2024 to identify and assess any known archaeological or architectural heritage and previously unrecorded features and portable finds within the application area.

12.2.2 Assessment of the Proposed Development

An assessment and mitigation strategy have been prepared. An assessment is undertaken to outline potential adverse effects that the proposed development may have on the cultural resource, while a mitigation strategy is designed to avoid, reduce or offset such adverse effects.

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 12-1. RMP sites included on the Records of Monuments and Places statutory mapping are identified by black circles. The application area is shown with a red line.

12.2.3 Guidelines

The report format and some of the descriptions of effects are based on the Guidelines on the Information to be contained in Environmental Impact Assessment Report, published by the EPA in May 2022.

12.3 Review and Findings

12.3.1 The Landscape

The application area is located in the townland of Whitestown Lower, Co. Wicklow, on OS Six-Inch sheet No. 21, ca. 2.4km to the southeast of the village of Donard and just east of the N81 road and west of the Carriggower River. The local soil is a Clonroche series fine loamy drift with Siliceous stones overlying drift with siliceous stones [140]. The lands are currently in use for pastoral agriculture.

12.3.2 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 application area is situated in the townland of Whitestown Lower, in the civil parish of Donaghmore and the barony of Talbotstown Upper. Note that the original spellings of placenames recorded in source material are retained in the text.

The Prehistoric Period

There are several 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. 1.35km to the south of the application area.

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 (MacCotter 2008, 177-9). 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 are no ringforts in the study, but there are enclosures in Ballylion Lower (RMP WI021-002----and WI021-003----) that may be the remains of ringforts.

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 subinfeudation, 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 subinfeudation is normally associated with the constriction of an earth and timber castle, known as a 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 a 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 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.

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, possibly, site in Castleruddery Lower (RMP WI021-025----) could have been a Tower House. The Down Survey records that in 1641 Whitestown Lower townland was held by Kimbro Dipho, and he retained it in 1670 (downsurevy.tcd.ie). Griffiths Primary valuation of Ireland 1847-64 records that in the mid-19th century, the application area was held by Richard Dodd and was leased to Edward Toole (http://www.askaboutireland.ie/griffith-valuation).

12.3.3 Wicklow County Development Plan 2022-28

Chapter 8 of the Wicklow Co. Development Plan 2022-28 sets out the policies and objectives on built heritage within the County.

12.3.3.1 Built Heritage

There are several objectives outlined in Section 8.5 of the plan in respect of 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 demonstration 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 practice 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 ('ACAs')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 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 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.

12.3.4 Buildings

Designated structures

The Record of Protected Structures in the Wicklow County Development Plan 2022-2028 was reviewed as part of the baseline study for this chapter. The review established that there are no structures within the proposed application area listed in the Record of Protected Structures. There are also no structures in the study area listed in the Record of Protected Structures.

Structures National Inventory of Architectural Heritage

The 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 22nd January 2024 [141]. The review established that there are no structures within the application area listed in the NIAH. There are also no structures in the study area listed in the NIAH.

Field inspection

On the 25th January 2024 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 100m of the application area (Figure 12-1). There are no such structures in this area (Figure 12-1).

Archaeological Assessment

12.3.5 Recorded Monuments

Examination of the Record of Monuments and Places for Co. Wicklow indicated that there are no Recorded Monument in the application area (Figure 12-1).

The closest Recorded Monument externally to the application area is WI021-003----, a levelled enclosure in Ballylion Lower townland (see Appendix 12.1). This is described in the Record of Monuments as:

WI021-003---- Ballylion Lower Enclosure

Situated on a gentle SE-facing slope overlooking a steep drop to Donard Brook (100m to the SE). Circular enclosure (diameter ca. 45m) shown on the 1838 OS 6-inch map. Not visible at ground level.

This monument is located ca. 740m northeast of the application area. The monument will not have a direct or indirect effect by the Proposed Development.

The remaining Recorded Monuments listed in the study area are all considered to be too distant to have a direct or indirect effect by the Proposed Development.

Note that in accordance with the Historic and Archaeological Heritage and Miscellaneous Provisions Bill 2023, the RMP will be replaced by the Register of Monuments, but the RMP was still legally in force when this assessment was prepared.

12.3.6 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 19th January 2024, indicated that there are no SMRs in the application area or the study area [141].

12.3.7 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 12-2 and 12-3). There are no archaeological, architectural, or cultural heritage features indicated in the application area.

Figure 12-2: The application area outlined in red, superimposed on the OS 1st edition six-inch map.

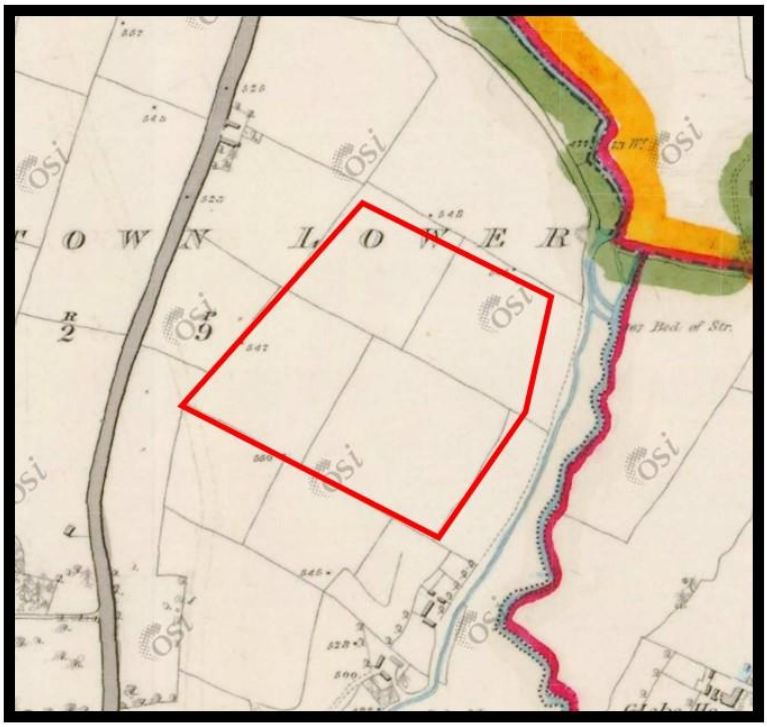
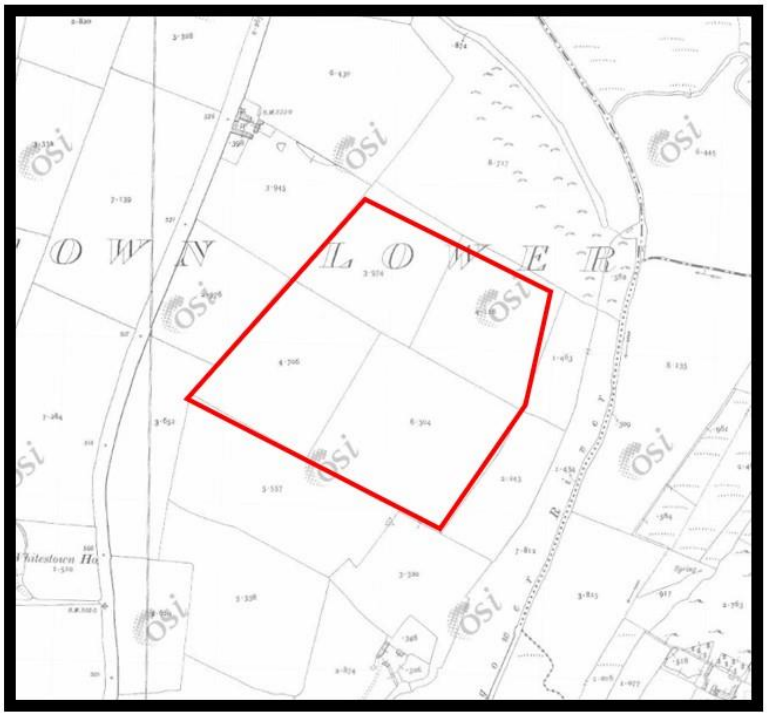


Figure 12-3: The application area outlined in red, superimposed on the OS 1st edition twenty-five-inch map.



12.3.8 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 [142] (Table 12-2). The placenames refer primarily to proprietors, as well as a castle in Castleruddery (WI021-025----) and a church in Donaghmore (WI021-069001).

Table 12-2: 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
Newtown	Anglicised
Randalstown	Randal's town
Whitestown Upper and Lower	White's town

12.3.9 Aerial Photography

Online Ordnance Survey aerial photography of the application area taken in 1995, 1996-2000 and 2001-2005, 2006-12 and 2011-13 and 2013-18, 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. There are no additional archaeological, architectural, or cultural heritage features visible in the imagery (Plate 12-1).

Figure 12-4: Google earth Aerial photo of the application area (indicated with the red line) taken in September 2022.

12.3.10 Other Sources

Examination of archaeological corpus works on prehistoric artefacts (Harbison, 1969) [143] (Eogan, Hoards of the Irish Later Bronze Age, 1983) [144] (Eogan, The Socketed Bronze Axes in Ireland. Prähistorische Bronzefunde, abteilung IX, band 22., 2000) [145] (Kavanagh, 1991) [146] (O'Riordain & Waddell , 1993) [147] (Raftery, 1984) [148] did not reveal any additional archaeological material from the study area.

12.3.11 Archaeological Investigations

A field inspection was carried out on the 25th of January 2024 [149]. This involved an inspection of all the lands in the application area (Figure 12-1 and Plate 12-1).

Area 1

Area 1 is a rectilinear-shaped area of relatively flat pasture, enclosed by banks with hedgerow and some mature trees (Plate 12-1). There is no visible indication of any archaeological, architectural, or cultural heritage material at ground level.

Plate 12-1: Panoramic view of area 1 looking northwest.

Area 2

Area 2 is a rectilinear shaped area of relatively flat pasture, enclosed by banks with hedgerow and some mature trees (Plate 12-2). There is no visible indication of any archaeological, architectural, or cultural heritage material at ground level.

Plate 12-2: View of the area 2 looking northwest.

12.3.12 Geophysical Survey

An Electromagnetic Induction Survey was conducted by Archaeological Management Solutions ('AMS') in September 2024 (NMS Licence No. 24R0466). The study area, covering approximately 7.6 hectares within the townland of Whitestown Lower, was surveyed within the defined Land Management Area ('LMA'). The geophysical survey produced generally strong responses, identifying a range of features. In addition to common pit-like features and historic field boundaries, 12 anomalies of potential archaeological interest were detected — eight in the northern field and four in the southern field (see Figure 12-4 and Table 12-3). The anomaly with the highest archaeological potential is WN-1 and its internal features WN-2 – WN-5. However, variations in the strength of the survey responses suggest differences in subsurface disturbance or material composition, indicating that the anomalies may be of archaeological, modern, or natural origin (see Appendix 12-1).

Figure 12-5: Geophysical survey interpretation drawing

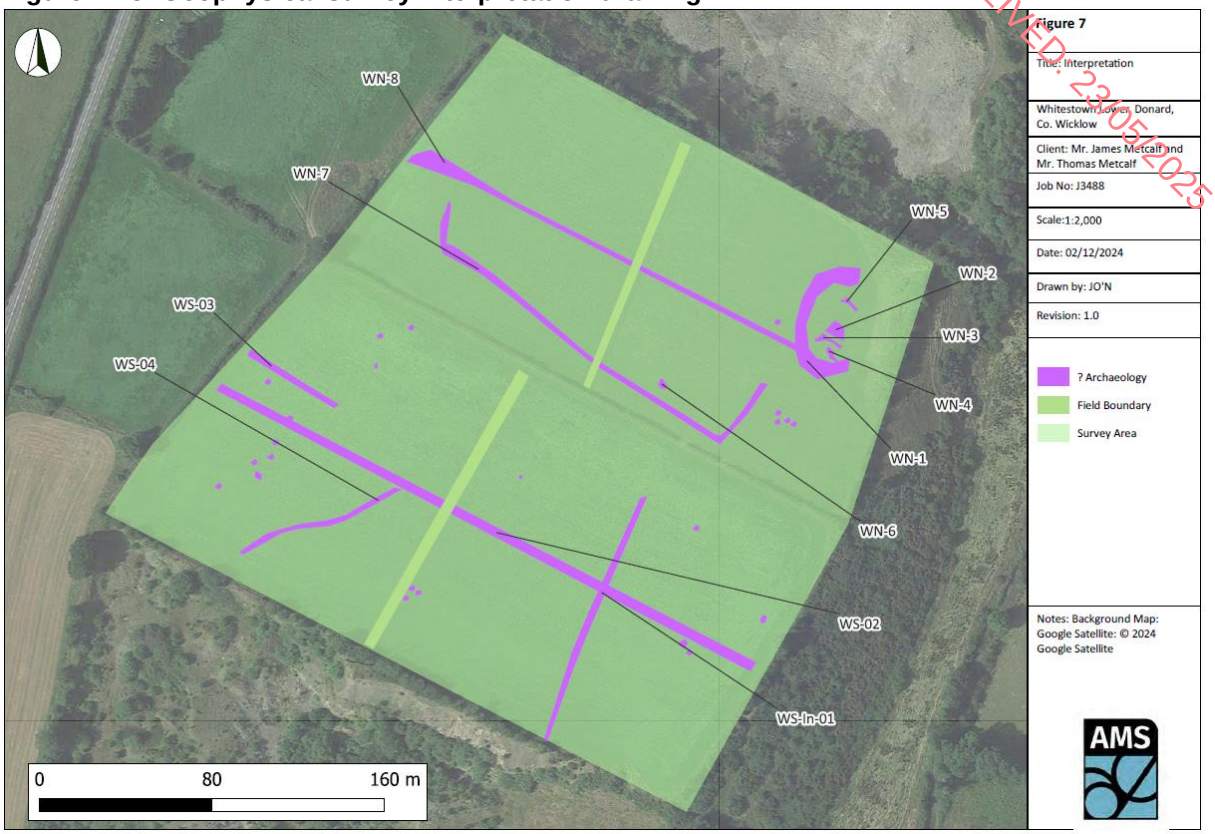


Table 12-3: Geophysical survey results

Anomaly ID	Anomaly Type	Size	Description	Interpretation
WN-1	? Archaeology	80m x 7.5m	Subcircular poss. enclosure	Located in the northeast corner of the northern field; may indicate a large enclosure with internal features.
WN-2	? Archaeology	8m x 6m	Possible Internal anomaly	May represent an internal feature of WN-1.
WN-3	? Archaeology	11m x 2m	Possible Internal anomaly	May represent an internal feature of WN-1.
WN-4	? Archaeology	8m x 3.5m	Possible Internal anomaly	May represent an internal feature of WN-1.
WN-5	? Archaeology	9m x 3.5m	Possible Internal anomaly	May represent an internal feature of WN-1.
WN-6	? Archaeology	2m x 1.5m	Potential pit	May represent a pit-like feature.
WN-7	? Archaeology	215m x 1m	Very faint rectilinear anomaly	Faint feature may indicate a rectilinear anomaly, possibly a large ditch, running east–west.

Anomaly ID	Anomaly Type	Size	Description	Interpretation
WN-08	? Archaeology	200m x 2m	Strong Linear anomaly	Appears in both datasets; may represent a ditch running east–west along the centre of the survey area.
WS-In-01	? Archaeology	122m x 2m	Linear anomaly	Linear anomaly running north–south; may represent a possible ditch.
WS-02	? Archaeology	275m x 2.5m	Strong Linear anomaly	Appears in both datasets; may represent a ditch running east–west along the centre of the study area.
WS-03	? Archaeology	49m x 2m	Linear anomaly	Appears in both datasets; may represent a ditch running east–west along the eastern edge of the study area.
WS-04	? Archaeology	80m x 1.5m	Faint Linear Anomaly	Appears in the Inphase dataset only; may represent a ditch running northeast–southwest along the centre of the study area.

12.4 Characteristics and Potential Effects of the Proposed Development

12.4.1 Construction and Operational Stage

Direct Effects

There will be no direct effects on any known items of archaeology, buildings of special architectural heritage interest, or cultural heritage in the application area or the vicinity during the construction and operational stage of the proposal.

Indirect Effects

There will be no indirect effects on any known items of archaeology, buildings of special architectural heritage interest, or cultural heritage in the application area or the vicinity during the construction and operational stage of the proposal.

Interaction with other Effects

No interaction with other effects have been identified.

Do nothing Effect

If the proposed development were not to proceed there would be no negative effect on archaeology, buildings of heritage interest, or cultural heritage.

Worst Case Effect

In the worst-case scenario soil stripping in areas 1 and 2 has the potential to have a permanent, significant, irreversible, total, negative/adverse effect on previously unknown subsurface archaeological deposits or artefacts without preservation by record taking place.

Cumulative Effect

No screened projects in the vicinity of the application site which may lead to cumulative effects have been identified and no cumulative effects arise.

Major Accidents

No effects on any known items of archaeology, buildings of special architectural 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.

12.4.2 Closure Stage

Direct Effects

There will be no direct effects on any known items of archaeology, buildings of special architectural heritage interest, or cultural heritage in the application area or the vicinity during the closure stage of the proposal.

Indirect Effects

There will be no indirect effects on any known items of archaeology, buildings of special architectural heritage interest, or cultural heritage in the application area or the vicinity during the closure stage of the proposal.

Interaction with other Effects

No interaction with other effects have been identified.

Do nothing Effect

If the proposed development were not to proceed there would be no negative effect on the cultural heritage.

Worst case Effect

No worst-case scenario has been identified at closure stage.

Residual Effects

After the proposed mitigation measures have been implemented there will be no residual effects on cultural heritage present within the application area or the vicinity.

12.5 Proposed Mitigation Measures/Factors

Due to the potential survival of previously unknown subsurface archaeological deposits or finds within the application area in areas 1 and 2 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.

12.6 Interaction with other Environmental Attributes

No interaction with other environmental attributes has been identified.

12.7 Monitoring

No additional monitoring, other than that required for mitigation, will be required.

12.8 Difficulties Encountered

No difficulties were encountered during the desktop study, field survey or in the preparation of this report.

13 TRAFFIC

13.1 Introduction

The following chapter assesses the traffic impacts associated with the proposed Quarry in Whitestown, Co. Wicklow.

In preparing this chapter reference has been made to the following documents:

- "Traffic and Transport Assessment Guidelines" (May 2014) published by TII;
- "Unit 5.3 (Travel Demand Projections) of the "Project Appraisal Guidelines" (October 2021), published by Transport Infrastructure Ireland;
- "Project Appraisal Guidelines for National Roads Unit 16.1 - Expansion Factors for Short Period Traffic Counts" (October 2016), published by TII;
- Traffic Count Survey Data, collected by Traffinomics;
- TII Publications document DN-GEO-03031, "Rural Road Link Design" (June 2017, May 2023), published by TII;
- TII Publications document DN-GEO-03060, "Geometric Design of Junctions (priority junctions, direct accesses, roundabouts, grade-separated and compact grade-separated junctions)" (May 2023), published by TII; and,
- Wicklow County Development Plan (2022 – 2028).

The objective of this assessment is to examine the traffic implications associated with the proposed development in terms of its integration with existing traffic in the area. This Chapter determines and quantifies the extent of additional trips generated by the development, and the impact on operational performance of such trips on the local road network.

13.2 Methodology

13.2.1 Desktop Review

The methodology adopted for this appraisal involved, in brief:

- A site visit on the 14th September 2023, at which time the weather was dry, and the ground surface was dry;
- 12-hour (7am – 7pm) manual classified Junction Turning Count ('JTC') surveys carried out by Traffinomics on the 23rd January 2024;
- 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 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 the junction between the N81 and the site access and its capacity was assessed using the 'Junctions 9' computer programme; 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 2025 (assumed year of opening), and at two future assessment years, the opening year +5 (2030) and the opening year +15 (2040).

13.3 Receiving Environment

The northeast portion of the site was previously used for the extraction of aggregate however these operations have since ceased. Following the closure of this quarrying activity, planning permission was successfully granted, under planning reference no. 201117, for the restoration of 2.73ha of the quarry through the importation of inert soils and stone as infill material.

Additionally, a further 0.21ha area of the site was to be restored using site-won materials. The existing operations at the site serve this restoration programme only, which is ongoing.

The proposed development will include the extraction, processing and storage, temporarily on site, of aggregates, extending the former sand and gravel pit into lands to the south. It is estimated that 275,000t of material will be excavated and removed from the site annually. Additionally, wet and dry screening will also occur on-site.

The Site will cover a total area of ca. 11.2ha (including the existing restoration operations).

All site-related Light Goods Vehicles ('LGVs') and HGVs will enter the site via the former sand and gravel pit entrance on the N81 National Road.

13.3.1 Site Location

The proposed quarry would be located in Whitestown, Co. Wicklow, in the area of Whitestown Upper, approximately 10km north of Baltinglass, and 20km south of Blessington. The site is an old quarry which is located to the east of the N81 and includes a short 250m long local access road between the quarry entrance and the N81 National Road.

The quarry benefits from an existing priority-controlled T-junction with the N81, which is located in a rural area, and has a posted speed limit of 80kph.

13.3.2 Description of Local Roads and Infrastructure

N81 National Road

The cross section of the N81, in the vicinity of the quarry's access road, is a two-way single carriageway road, with a single traffic lane and hard shoulder in each direction. It runs in a north-south direction over a length of approximately 75km, extending from Dublin in the north to Tullow, Co. Carlow in the south.

The road is approximately 11m wide in the vicinity of the proposed site access, which includes 3m wide traffic lanes and 1.5-2.5m wide hard shoulders.

The N81 has a posted speed limit of 80kph in the vicinity of the site access.

Figure 13-1: N81 Looking North from Site Access

13.3.3 Existing and Proposed Traffic Conditions

Traffic counts (12-Hour classified counts) were carried out on Tuesday 23rd January 2024 at the junction between the N81 and the site access. 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;
- 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 13-1. The morning and evening peak hours have been established as follows:

- T-Junction of the N81 and the Site Access (referred to as the 'Site Access' in this report) – 08:00 to 09:00 (AM Peak) and 17:15 to 18:15 (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 0.97 for the Tuesday traffic count. Finally, this was converted to AADT using an index of 1.13 for the month of January. These factors were used to calculate the AADT for the site access junction.

Table 13-1: Estimated AADTs at N81/Site Access Junction

Hour Ending	N81 (N)	Site Access	N81 (S)
08:00	382	2	384
09:00	469	3	466
10:00	282	6	284
11:00	237	10	233
12:00	233	1	232
13:00	219	2	219
14:00	242	5	241
15:00	273	9	274
16:00	298	0	298
17:00	451	6	453
18:00	455	6	457
19:00	459	5	462
Period Total	**4,000**	**55**	**4,003**
Period Total HGVs	**439**	**51**	**442**
% HGVs	**11.0%**	**92.7%**	**11.0%**
Total AADT	**5,407**	**75**	**5,411**

13.3.4 Traffic Generation and Trip Distribution

Approximately 275,000 tonnes of material will be excavated and removed from the Site annually. Additionally, wet and dry screening will also occur on-site.

In determining the daily traffic volumes associated with the development, an average of 41 loads per day from the site has been calculated based on the following assumptions:

- The site operates for 49 weeks per year;
- Material is transported to/from the site in 25 tonnes/load average (via a mix of 8-wheel rigid and articulated vehicles);
- The facility will operate for six days per week (Monday to Saturday) inclusive; and,
- The development opening times will be 08:00 to 18:00 Monday to Friday and 08:00 to 14:00 on Saturday; however, HGV movements and loading will be from 07:00 to 19:00 Monday to Friday and 07:00 to 15:00 on Saturday.

Table 13-2 below summarises the calculation of daily trips to/from the site from the average annual export rates.

Table 13-2: Transportation Quantities of Material

Transported Quantities of Material	
Total Exported Material (tonnes per annum)	275,000
Quantity per Week (49 operational weeks / year)	5,612
Quantity per day (5.5 workings days/week)	1,020
Loads per day (25 tonnes per load)	41

The site currently employs 4 - 5 staff members, and it is not anticipated that these numbers will increase. Staff movements will generate ten peak hour trips, five trips inbound in the morning and 5 trips outbound in the evening peak. Staff car movements have been distributed in accordance with the existing light vehicle distribution at the site access.

Four trips, two inbound and two outbound, have been assumed to occur daily to cater for possible miscellaneous trips associated with the site. These miscellaneous trips allow for refuelling, maintenance operations, etc. It is not considered that these trips would coincide with either peak hour.

The total daily trips associated with the quarry operation accounts for 96 movements daily, 82 of which relate to HGV's (85.42%).

Table 13-3 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 (refer to Appendix 13-2). By inspection, it can be seen that the pattern of arrivals/departures is consistent with a short turnaround within the sites, e.g. that vehicles generally arrive and depart within a short time period, likely to be less than an hour.

Table 13-3: Summary of Predicted Daily Trips in Opening Year and Beyond

Development	Type of Traffic	Daily Trips	
		Arrivals	Departures
Quarry	LVs (Staff)	5	5
	LV (Msc)	2	2
	HGVs	41	41
Total		48	48

The distribution of the development traffic on the adjacent road network is based on an assessment of the existing traffic flows at the site access derived from the traffic count data.

13.3.5 Adjacent Developments

A search was undertaken of planned future developments, not yet built or operational, which may have an impact on future traffic flows in the vicinity of the proposed site.

One adjacent development in the vicinity of the proposed Quarry was identified that is considered to be of a sufficient scale such that traffic generated by this development may impact on the future performance of the junction and road network.

The development is a proposed quarry in Deerpark, Donard, Co. Wicklow. The site will be accessed from the Donard Mountain Road which is located to the southeast of the proposed Whitestown Quarry. The Deerpark Quarry shall have an average annual extraction rate of 200,000t.

Table 13-4 shows the estimated trips for this adjacent development. The trips generated by this adjacent development, have been added to the background traffic for this traffic assessment for the Opening Year, the Opening Year +5 and the Opening Year +15.

This is considered a conservative approach as the traffic growth factors used in the analysis are based on the forecast of future developments such as this adjacent development.

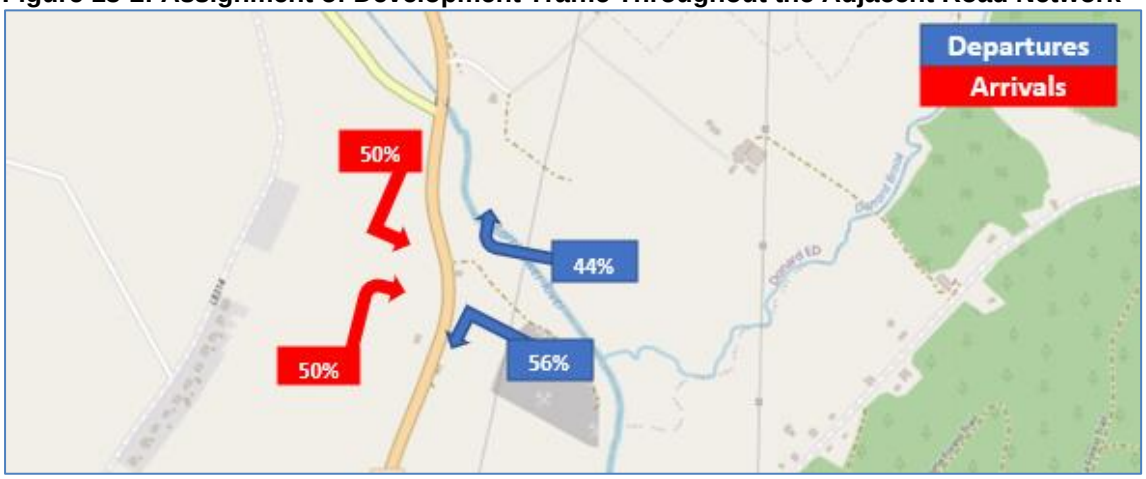
Table 13-4: Adjacent Development Traffic – Deerpark Quarry

Development	Type of Traffic	Daily Trips	
		Arrivals	Departures
Quarry	LVs (Staff)	8	8
	LV (Msc)	1	1
	HGVs	50	50
Total		59	59

13.3.6 Trip Assignment

The assignment of the forecast development traffic onto the adjacent road network is based on the existing traffic flow distribution at the site access junction as derived from the traffic counts data. This is illustrated in Figure 13-2.

Figure 13-2: Assignment of Development Traffic Throughout the Adjacent Road Network



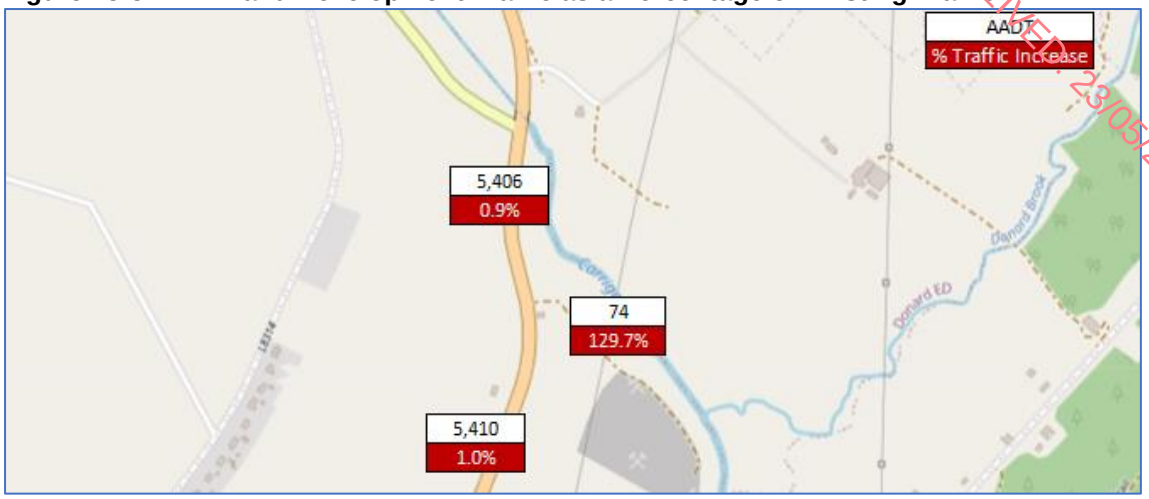
13.3.7 Scope of Assessment

The site operations at Whitestown, Co. Wicklow, will result in an increase in the traffic volumes at junctions within the road network in the vicinity of the proposed development.

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 13-3 outlines the distributed development traffic as a percentage of the background traffic on the adjacent road network.

Figure 13-3: AADT and Development Traffic as a Percentage of Existing Traffic



As shown in Figure 13-3, the development traffic is indicated as exceeding 10% of background traffic on the Site Access Road at its junction with the N81. As a result, capacity assessment shall focus on the N81 Site Access junction, and its links.

13.3.8 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 2024 traffic count.

Table 13-5 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 13-5: 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

13.3.9 Link Capacity Assessment

N81 National Road

The capacity of the N81 has been assessed with reference to the TII Publications document DN-GEO-03031, "Rural Road Link Design" (June 2017).

The TII Publications document reference DN-GEO-03031 (June 2017) provides guidance on recommended rural road layouts in its Table 6/1.

The 'Road Type' selected for the N81, which best describes the road layout, is a 'Type 1 Single Carriageway' in accordance with this publication, which represents a 7.3m wide carriageway with 2.5m wide hard shoulders which minimises the number of accesses to avoid standing vehicles and minimise turning movements. The maximum AADT for a road of this type at Level of Service D is 11,600.

The combined background and Site Traffic volumes, outlined in Table 13-6 in each of the assessment years is less than the LOS D capacity of 11,600 AADT for a Type 1 Single Carriageway. It is considered that the N81 National Road will operate within capacity for each of the assessment years.

Table 13-6 indicates that the traffic associated with the proposed development represents between 1.71% and 1.48% of the total traffic on the N81 during the assessment years 2025 to 2040.

Table 13-6: Combine AADT for each Assessment Year on the N81 National Road

	Assessment Year		
	2025	**2030**	**2040**
Background Traffic	5,508	5,960	6,371
Additional Development Traffic	96	96	96
Combined Traffic (Background + Additional Dev. Traffic)	5,604	6,056	6,467
Additional Traffic as % of Combined Traffic	1.71%	1.59%	1.48%

13.3.10 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 quarry 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, in a given time period, exceeds the theoretical capacity, 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 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.

Location 1: Site Access

A summary of the junction capacity analysis results for the junction of the site access are shown in Table 13-7.

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 T-junction (refer to Appendix 13-3).

Table 13-7: Summary of Traffic Analysis at N81/Site Access Junction

	12 Hours (07:00 – 19:00)			
	Queue (Veh)	**Delay (s)**	**RFC**	**LOS**
Stream	**2025 Without Development**			
Site Access - N81 (South)	0.0	13.94	0.02	B
Site Access - N81 (North)	0.0	19.53	0.04	C
N81	0.0	13.27	0.03	B
Stream	**2025 With Development**			
Site Access - N81 (South)	0.0	15.26	0.03	C
Site Access - N81 (North)	0.1	23.36	0.05	C
N81	0.0	13.31	0.04	B
Stream	**2030 Without Development**			
Site Access - N81 (South)	0.0	14.22	0.02	B
Site Access - N81 (North)	0.0	20.11	0.05	C
N81	0.0	13.52	0.03	B
Stream	**2030 With Development**			
Site Access - N81 (South)	0.0	15.60	0.04	C
Site Access - N81 (North)	0.1	24.23	0.06	C
N81	0.1	13.56	0.04	B
Stream	**2040 Without Development**			
Site Access - N81 (South)	0.0	14.52	0.02	B
Site Access - N81 (North)	0.1	20.70	0.06	C
N81	0.0	13.77	0.04	B
Stream	**2040 With Development**			
Site Access - N81 (South)	0.0	15.95	0.04	C
Site Access - N81 (North)	0.1	25.11	0.07	D
N81	0.1	13.81	0.05	B

13.3.11 Sightlines

Sightlines at the access have been assessed against Section 5.6.3 of the 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 N81 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.

Following a visual assessment on site of the quarry access at its junction with the N81, the requirements of DN-GEO-03031 can be met if the following actions are taken:

- Vegetation within the verge should be maintained, ensuring overgrown vegetation does not diminish the available sightlines at the access; and,
- The sign warning southbound road users of the quarry access should be relocated further upstream, so that it does not momentarily obstruct sightlines at the access.

Figure 13-4: Sightlines to the North (Left) and South (Right) at the Site Access on the N81

In addition, the N81's northbound carriageway includes a left-hand curve upstream of the access and there is the potential that northbound drivers may have restricted visibility to, and not anticipate, a stationary right turning vehicle waiting for a gap in southbound traffic before turning into the Quarry's access. Whilst sightlines were found to be acceptable, it should be noted that the N81's alignment does not provide tolerance beyond the 160m available on site. However, in the event that a northbound driver fails to observe a stationary vehicle in the road, the nearside hard shoulder should offer a safe route to pass a stationary vehicle.

13.3.12 Parking

Given the size of the Proposed Development, and the proposed maximum number of staff (4-5), the parking provision within the site has been assessed as being satisfactory.

13.3.13 Public Transport

There are no existing public transport provisions in place in the vicinity of the Site.

13.3.14 Pedestrians & Cyclists

The site is located in a rural area and does not currently have any existing pedestrian or cycle facilities available in the vicinity of the quarry access.

13.3.15 Operational Assessment Conclusions

The following conclusions have been determined:

- Link capacity analysis was carried out on the N81 National 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 the development;
- Visibility splays were found to be satisfactory when assessed in accordance with the requirements of DN-GEO-03031, though routine maintenance of the verge and hedgerow either side of the quarry's access on the N81 will be required, and an existing sign will need to be relocated further north so as not to interfere with existing sightlines; and,
- The parking provision within the site has been assessed and is considered to be satisfactory.

13.4 Proposed Mitigation Measures and/or Factors

13.4.1 Mitigation and Management

Following the link, and junction, capacity assessments, the trips associated with the operation of the proposed quarry at Whitestown, Co. Wicklow, were found to have an imperceptible impact on the link capacity of the N81 National Road and the junction capacity of Site Access Junction.

Visibility splays were found to be satisfactory when assessed in accordance with the requirements of DN-GEO-03031, though routine maintenance of the verge and hedgerow either side of the quarry's access on the N81 will be required, and an existing sign will need to be relocated further north, so as not to interfere with existing sightlines.

The impact of the proposed quarry, in relation to road safety and the existing road infrastructure, was also determined to be imperceptible.

13.5 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. Their cumulative effects in combination with the proposed development were assessed and found to have an imperceptible impact on the local road network, as noted in section 1.3.5.

13.6 Interactions with Other Environmental Attributes

The vehicular traffic flows that shall be generated by the 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.

13.7 Indirect Effects

The indirect effects of the development, in relation to traffic, on the surrounding road environment are deemed to be imperceptible.

13.8 Residual Effects

The residual effects of the development, in relation to traffic, on the surrounding road environment are deemed to be imperceptible.

13.9 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.

Routine maintenance of the verge and hedgerow on either side of the quarry's access on the N81 will be required over the life of the quarry, so as not to interfere with existing sightlines.

13.10 Reinstatement

The proposed restoration of the Site will occur following the exhaustion of the aggregates within the Proposed Development; as such, road traffic from the Site will return to existing volumes.

13.11 Difficulties Encountered

There were no particular difficulties encountered during the compilation of this chapter.

14 LANDSCAPE AND VISUAL

14.1 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.

14.2 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 [6]; 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.

14.3 Assessment Criteria

Landscape Impact and Visual Impact of the Proposed Development will be assessed using the methodology as detailed in Appendix 14-1.

14.4 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 Site and wider study area is provided.

14.4.1 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 14-1: Study Area (blue circle), 3km around Site

14.4.2 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.

Figure 14-2: Site context

14.4.2.1 Landform and Drainage

The Proposed Development is situated along the lowland corridor of the Carrigower River, to the west of the foothills of the Wicklow Mountains. Whilst the Proposed Development is situated at an elevation ranging between 150-165m AOD, the adjacent river corridor drops to 141m AOD, and the summit of the nearest foothill rises to a maximum of 368.7m AOD. To the west, the terrain widens to a broad area of low rolling terrain in the surrounds of the Carrigower River in the north and south and wider farmland to the west. 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.

14.4.2.2 Vegetation and Land Use

The land use of the site is principally contained in sloping 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, including the central study area. Other notable land uses include existing quarries and the N81 national secondary route corridor, both located immediately adjacent to the site.

14.4.2.3 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 2.5km 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.

14.4.2.4 Transport Routes

The principal transport route in relation to the Site is the N81 national secondary route, located ca. 80m 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 650m north 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 runs along the eastern side of the Carrigower River, 400m east of the site Site and links down to another road to the south that runs between the N81 and the Glen of Imaal.

14.4.2.5 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.

14.4.3 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:

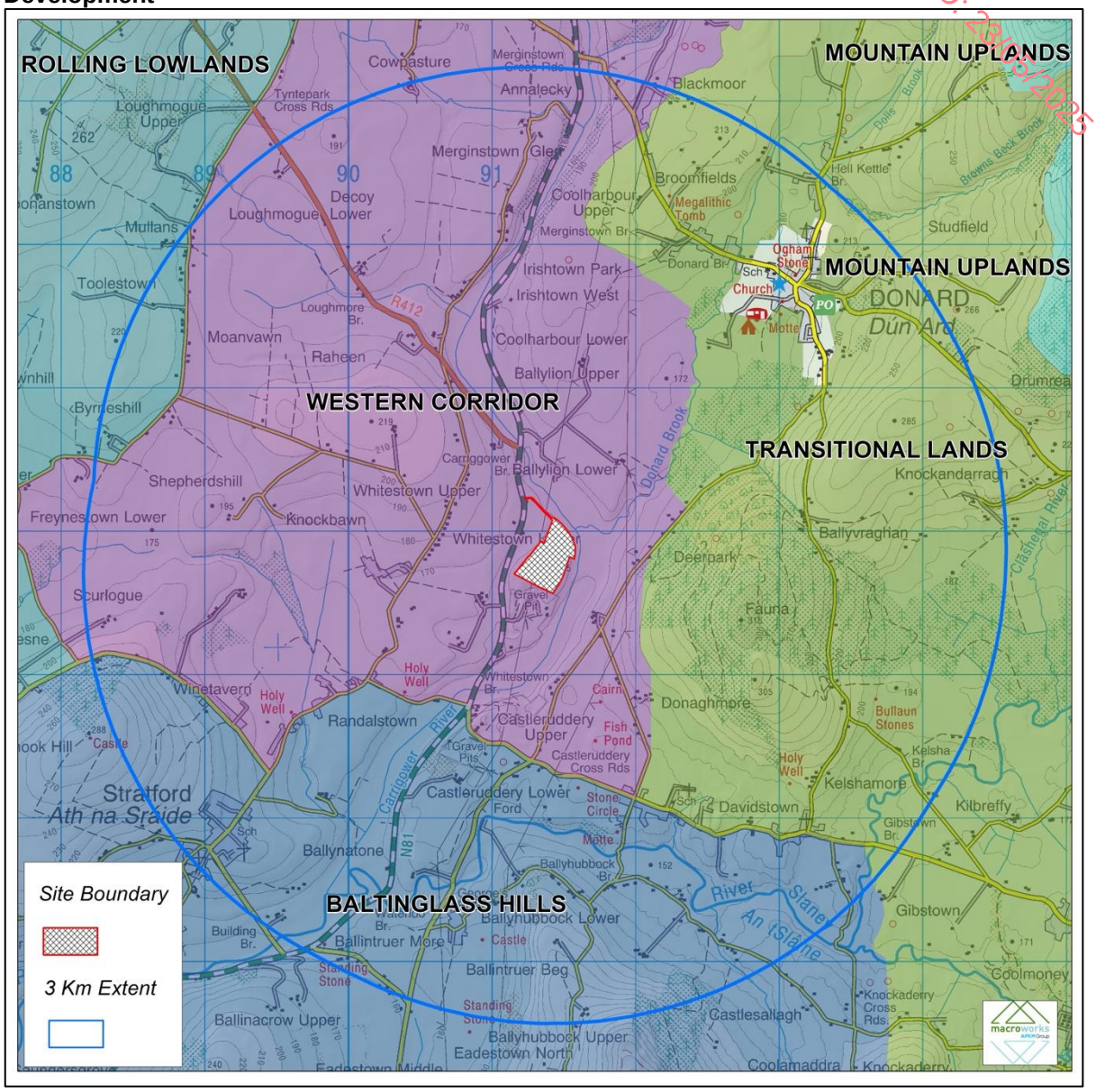
- ***'CPO 17.35*** *All development proposals shall have regard to the County landscape classification hierarchy in particular the key landscape features and characteristics identified in the Wicklow Landscape Assessment (set in Volume 3 of the 2016 County Development Plan) and the 'Key Development Considerations' 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.'*

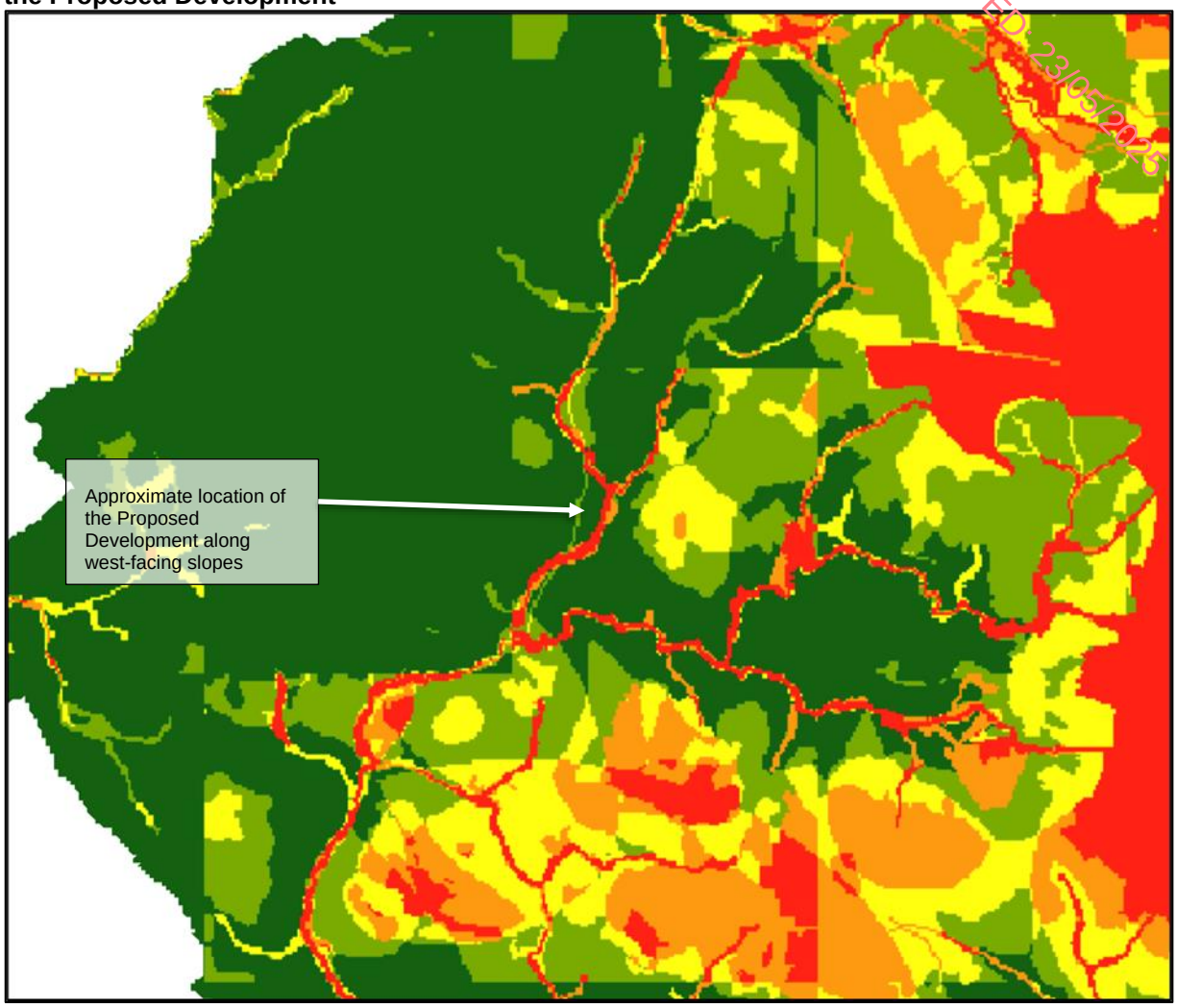
A Landscape Character Assessment was produced for County Wicklow and was incorporated into the current CDP. The Site is contained within landscape character type 'Corridor Area West N81', while the wider study area overlays 'Transitional Lands (5-AHA)' to the east, and 'Baltinglass Hills' to the south, refer to Figure 14-3 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.

Figure 14-3: 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 Figure 14-4 below, the Proposed Development is contained across landscape sensitivity classifications ranging between Low to Medium, with the river corridor to the east a 'High' and 'Medium' sensitivity, while the elevated eastern parts of the site are of a 'Medium' sensitivity. Across the wider western study area, the less elevated parts of the site are classified with a 'Low' sensitivity rating.

Figure 14-4: 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

14.4.3.1 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.

14.4.3.2 National Parks & Wildlife Service

According to the National Parks & Wildlife Service ('NPWS'), within the study area there are 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.

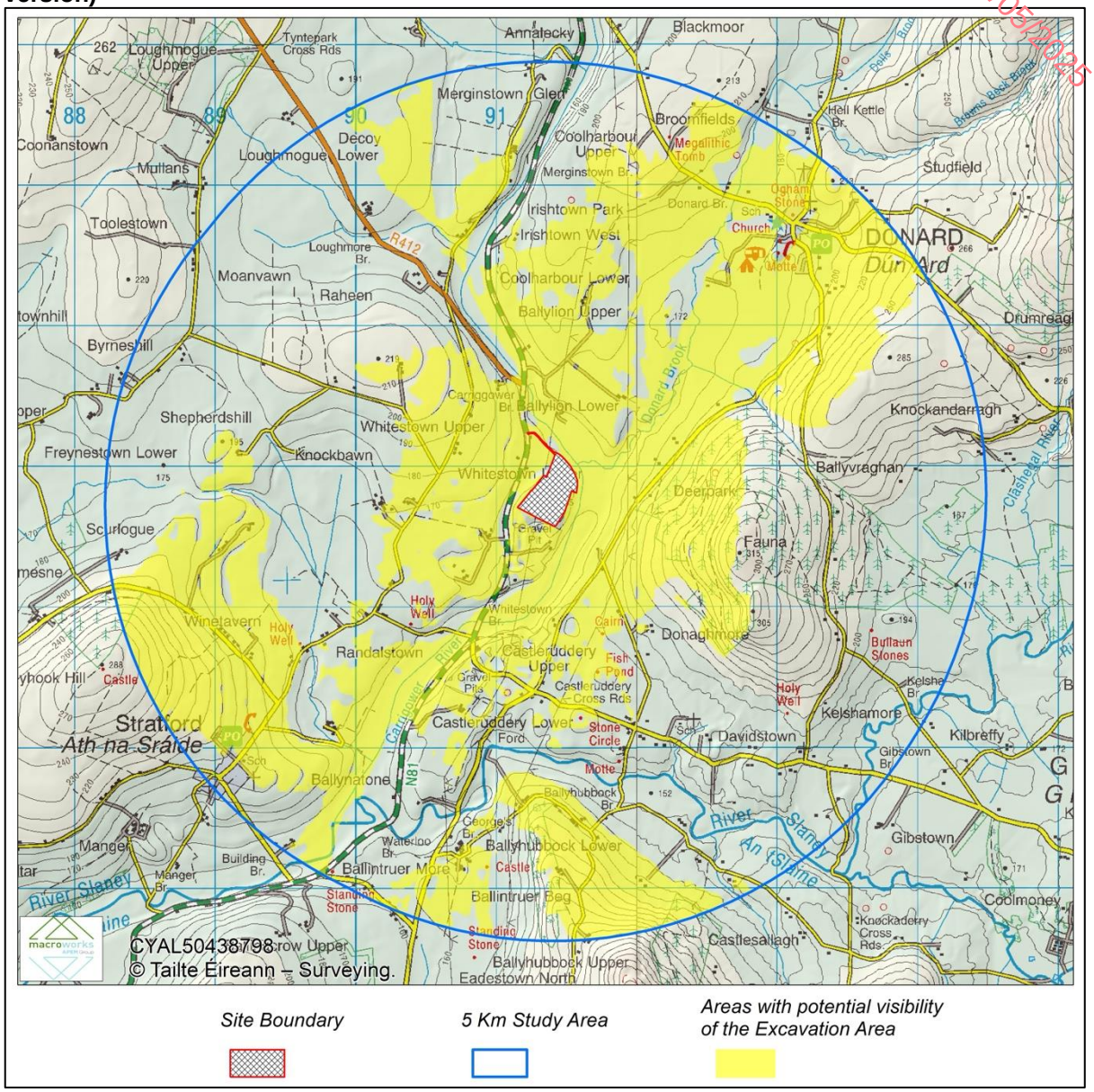
14.4.4 Visual Baseline

14.4.4.1 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.

Figure 14-5: Standard (bare ground) ZTV Map for Site (Refer to Appendix 14-2 for larger scale version)



The following key points are illustrated by the 'bare-ground' ZTV map (see Figure 14-5 above):

- Due to the location of the Proposed Development within the Carrigower river valley, visibility is confined to the facing slopes of the valley. A considerable proportion of the eastern half of the study area will have no visibility of the Proposed Development due to the intervening terrain to the east of the Carrigower River. The same is true to the wider western study area, however the boundary of visibility is varied along the rolling pastoral landform that gradually slopes towards the Site;
- There are cohesive areas of potential visibility of the Proposed Development between 0-2km from the Site, where the base of Deerpark Hill and surrounding rolling landform face towards the northwest. The largest area of visibility within the study area extends northwards across Deerpark Hill up to the population centre of Donard. There are some localised parts of the study area to the southeast of the Site in the surroundings

of the River Slaney and northern face of Ballyhook Hill which feature potential visibility however the Slaney River Corridor itself is screened; and,

- As above, much of the western half of the study area will be screened by the surrounding landform, while the areas in closer proximity to the site afford comprehensive visibility of the Proposed Development. To the north and south in particular along the N81 corridor, there is intermittent but generally reduced visibility.

The most important point to make in respect of this 'bare-ground' ZTV map is that it is theoretical. The Proposed Development is predominantly below the existing ground levels 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.

14.4.4.2 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:

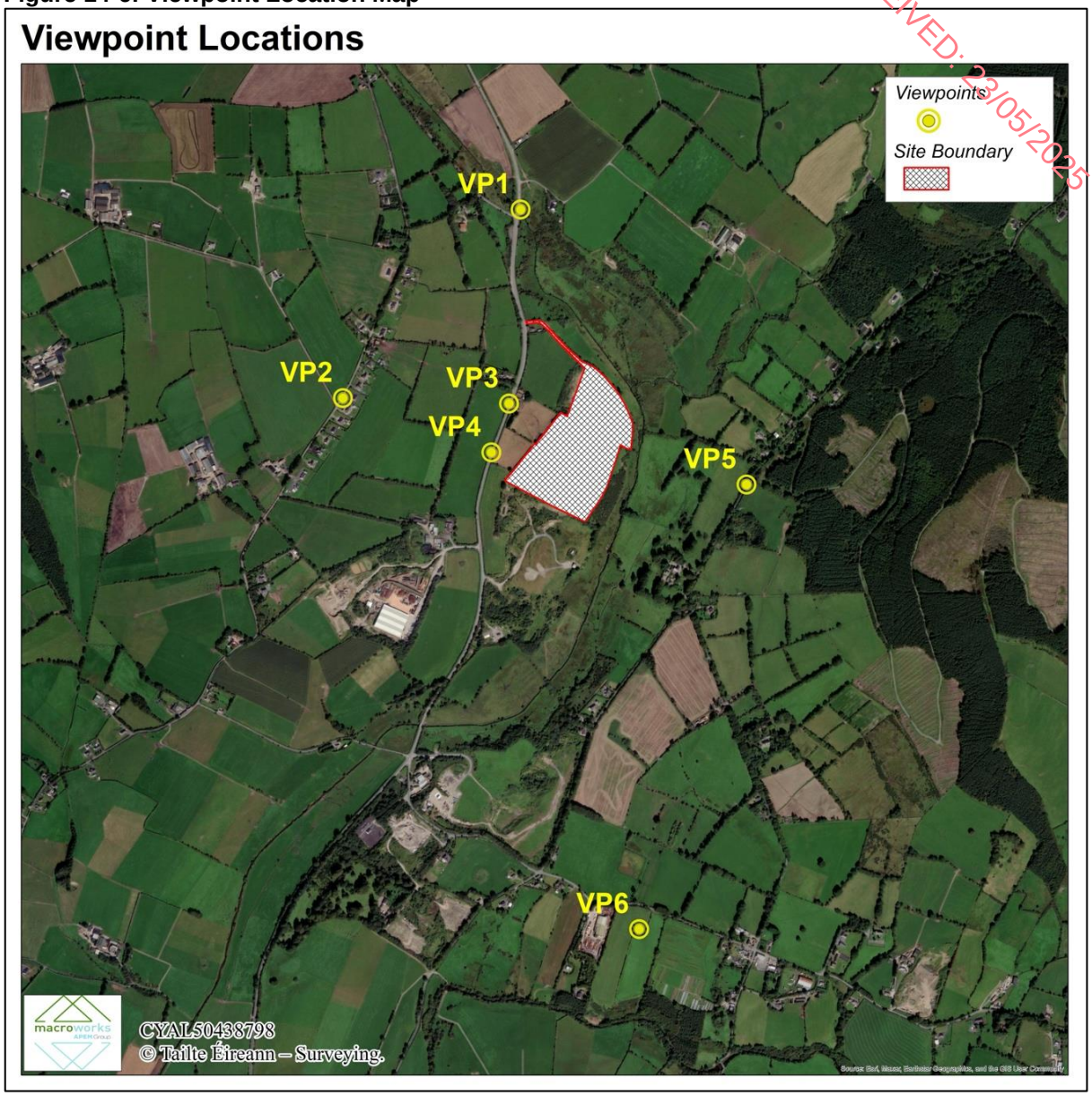
- Key Views (from features of national or international importance);
- Designated Scenic Routes and Views;
- Local Community views;
- Centres of Population;
- Major Routes; and,
- Amenity and heritage features.

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 14-1 and Figure 14-6 below.

Table 1414-1: Representative Viewpoints

VP No.	Location	Direction of View
VP1	T-Junction on the N81 northwest of the site at Ballylion Lower	S
VP2	Local road west of the site at Whitestown Lower	E
VP3	N81 west of the site at Whitestown Lower	E
VP4	N81 west of the site at Whitestown Lower	E
VP5	Local road east of Site at Newtown	W
VP6	Castleruddery Stone Circle at Castleruddery Lower	N

Figure 14-6: Viewpoint Location Map



14.5 Characteristics and Potential Impacts of the Proposed Development

14.5.1 Proposed Development Characteristics

The Proposed Development entails the extraction of an existing area of pastoral land along the lowland corridor of a rolling pasture in the townland of Whitestown Lower. The former quarry, located in the northern portion of the Site, was previously used for aggregate extraction.

The southern boundary of the former quarry, adjacent to the corresponding extraction area, consists of a high gravel face sloping backwards in a southern direction, rising ca. 20m above the existing pit floor.

The Proposed Development seeks to establish a sand and gravel extraction area south of the former quarry to supply quality aggregates to the local market. The proposed extraction area is ca. 7.75ha.

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 existing hedgerow boundaries to the east, south and west will be bolstered, while the northern boundary of the Proposed Development will be modified for site access, and one internal hedgerow will be removed. The hedgerows will be bolstered with a low canopy woodland mix of native species to further screen and soften the development from surrounding receptors.

In terms of the site restoration, upon removal of the aggregate reserve, the Site will undergo rehabilitation as per the Restoration Plan attached as Appendix 6-1.

14.5.2 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.

14.5.2.1 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 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 located along the rolling western periphery of the Carrigower River corridor, contained to the east by the foothills of the Wicklow Mountains and to the west by open pastoral landscapes. The eastern study area is more dramatic, featuring a rapid transition from the river corridor up a local hill which rises to a max height of 368m AOD, cloaked in a combination of pastoral lands and extensive areas of commercial conifer forestry. This terrain tends to be characterised by transitional rolling hills that merge into the Wicklow Mountains further in the distance, whilst to the west and in the immediate Site surrounds, the terrain descends towards a more typical and non-distinctive low-rolling landscape context. The central and western study areas are more uniform, with the primary source of sensitivity derived from the proximity to the transitional river corridor and upland areas. The foothill context of the study area is balanced with the strong utilitarian influence within the surrounding landscape, with the varied anthropogenic land uses such as existing quarries, the N81 national secondary route corridor, an existing substation development and 'ribbon' residential development. The division between the eastern and western study area is reflected in the current landscape assessment for County Wicklow, as the Proposed Development and western study area is contained within 'the N81 (Corridor Area)' landscape character area,

within 500m of 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, which bridges the southern study area across both of the 'Western Corridor' LCA and the 'Transitional Lands' LCA 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 rural subsistence. Therefore, on the balance of these factors and in accordance with the criteria outlined in Appendix 14-1, the landscape sensitivity is deemed to be Medium-low, with localised areas of higher and lower sensitivity.

14.5.2.2 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. 7.75ha from approximately 165m AOD to a final floor level of 143m AOD. Quarrying activities generally result in permanent landscape changes; however, any effects generated during the operational stage can be reversed and offset during the decommissioning and restoration phase through a comprehensive restoration plan. The Proposed Development also encompasses the construction of ancillary features such as an access road, a welfare unit (site office), weighbridge, wheel wash, wash plant, shed, screening plant, settlement pond and other ancillary features. The periphery of the Proposed Development will be planted with a native woodland mix comprising whips and advanced nursery stock (standard trees and feathered trees 200-300cm) 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 reshaping and grassing of the Site, with the reforming of the settlement pond to a wetland offsetting some of the landscape effects generated in the operational phase of the Proposed Development.

The proposed new screening planting may increase enclosure for the immediately adjacent section of the N81 road corridor, but their presence is still considered preferable to views of the excavated faces of the extraction activity, in particular from the elevated east and western study area. Additionally, a mix of shrubby and taller vegetation is consistent with the adjacent river corridor and taller, well-treed hedgerows are common in the wider rural setting.

This is a productive rural landscape containing several other small quarries and sand pits - one of which is located within the Site. As a result, whilst the Proposed Development will intensify the extractive industry within the local landscape, it will not appear as an incongruous development type in the surrounding local landscape. Within the sites immediate surrounds, the Proposed Development will reduce the proportion of pastoral land cover across the small hill bracketed by the N81 to the west and the Carrigower River to the east. While the landscape immediately adjacent to the N81 remains in pasture, while the majority of the landform will be occupied by one connected area of operational and historic quarrying, bordered by vegetation to the west along the Carrigower River Corridor. 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 an increase in the frequency of heavy vehicle movements within the local road network as a result of the Proposed Development. The

increase of heavy vehicle activity will be more concentrated within the boundaries of the Site. Therefore, the effect will be of intensification of extractive land use, consolidated within clearly defined boundaries.

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 14-1), the Medium-low landscape sensitivity judgement attributed to the study area, coupled with a High-Medium 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.

14.5.3 Visual Impact Assessment

14.5.3.1 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. As such, there are receptors which experience open views over lowland areas, or conversely, views defined by surrounding upland areas. The sensitivity of the wide lowland views is typically defined by the integrity of the landscape character, while those towards the upland areas also depend on how clear the view is of the surrounding noteworthy features. The Site is, bracketed to the west by the N81 corridor, and the east by the Carrigower River Corridor. The N81 features a higher number of viewers and a scenic designation where it crosses into the northern study area. To the east, the terrain tends to be characterised by transitional rolling hills that merge into the Wicklow Mountains further in the distance, with the section closest to the Site a well-treed river valley with little development and limited road receptors. As such, views from the eastern study area are typically enclosed by roadside hedgerows, woodland and conifer forestry, and brief sections where views over the low lying river corridor and the distant rural setting are possible. 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. As such, the majority of viewers are local residents, with a high level of familiarity with the surrounding rural setting, with the exception of those travelling the N81 from further afield. 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, views of which would feature Medium-low sensitivity. However, the wider setting also features an 'Area of High Amenity' assigned to the Baltinglass Hills in the south of the study area, which indicates a higher level of visual and landscape amenity, with typical views within this area featuring Medium sensitivity. Localised sensitivities such as the scenic designation in the north of the study area and the Castleruddery Stone Circle in the south of the study area. Castleruddery and other such heritage receptors will feature higher viewpoint sensitivity.

14.5.3.2 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 Proposed 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; and,
4. Montage view with mitigation established.

The six viewpoints selected and assessed for this project are represented by photomontages that are presented in Appendix 14-2. All viewpoints are assessed below according to the methodology, baseline environment and technical criteria set out in Appendix 14-1.

Table 14-2: 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	**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, Spinains Hill and Brusselstown.	**High-medium**	The Proposed Development will be visible here in alignment with Spinains Hill and Brusselstown in the distance to the south. The Proposed Development is briefly visible in the layered foreground. While the exposed earth will contrast with the verdant tones and texture of the surrounding pastoral scene, visibility is limited through foreground vegetation. Given the low-lying location of the Proposed Development within the wider view, it will marginally detract from its pleasant rural qualities without obstruction of any of its scenic aspects. Overall, the magnitude of visual effect is deemed Low. The proposed native woodland planting will be subtly discernible from here just above the upper lip of the quarry void. This mitigation planting will have little screening effect due to the alignment with the quarry entrance, but it will serve to soften the view of the quarry. Nonetheless, the residual magnitude of the effect remains Low.	**Moderate-slight / Negative / Medium-term**	**Moderate-slight / Negative / Permanent**
VP2	**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 is generally screened, with visibility limited to glimpses through intervening vegetation. Located downhill of the viewer, towards the Carrigower River at a distance of 600m, the Site is predominantly screened by the layers of hedgerows and roadside vegetation across the midground. 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.. Importantly, the Proposed Development is located along the N81 corridor, separated from the upland areas by the Carrigower River. While the partially	**Slight-imperceptible / Negative/ Medium-term**	**Imperceptible / Neutral / Permanent**

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
			visible quarry will marginally detract from this transitional setting. The Proposed Development does not block the more sensitive viewing aspect towards the elevated uplands. Overall, the magnitude of the effect is deemed Low-negligible. The proposed screening vegetation above the upper lip of the quarry void will be subtly discernible from here. This mitigation planting will serve to soften the view of the quarry, as well as screening the opposite face. Thus, the residual magnitude of the effect reduces to Negligible.		
VP3	**N81 west of the Site at Whitestown Lower** – This is a brief view afforded from the N81 national secondary route through 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 east up the transitional landscape which screens much of the Wicklow Mountains from view. The view is partially contained at a relatively short distance by the sloping field which forms the eastern boundary of the site, whilst in the distance Deerpark Hill contains the background of the view.	**Medium**	The primary visual change from this location will be the reduction in height of the foreground landform. Due to the slightly uphill perspective, views to the cut face are limited, with only one small section of the northern cut visible. Due to the retention of the existing hedgerow, the key characteristics of the view are retained, softening the engineered ridge. The changes are expected to only be evident to those familiar with the existing landform, and do not detract from the view towards the rolling backdrop. Therefore, the primary effect is change in the form of the ridgeline in the foreground. As such, prior to mitigation, the magnitude of the effect is deemed Low-negligible. The proposed native woodland planting will be clearly visible from here, along with the introduction of screening vegetation above the upper lip of the quarry void. This mitigation planting will serve to slightly enclose the view, however in a natural manner and in keeping with the wider setting. Thus, the residual magnitude of the effect remains Low-Negligible.	**Slight-imperceptible / Negative-neutral / Medium-term**	**Slight-imperceptible / Negative-neutral / Permanent**

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
VP4	**N81 northwest of the Site at Whitestown Lower** – This a similar view to VP4, located 170m south along the same section of the N81 national secondary route. With a trimmed hedgerow across the foreground, longer distance views are screened by the sloping field west of the site. The depicted view is representative of the major route receptor and surrounding residential receptors and affords a view to the northeast towards the Wicklow Mountains, but is otherwise contained by the hedgerow and fields to the west of the site.	**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. Following mitigation, the road corridor will be more enclosed to the east, with the screening planting lining the adjacent field and defining the view. However, this planting is in keeping with the wider surrounds and therefore is deemed Low magnitude and Neutral quality.	**Negligible / Neutral / Medium-term**	**Slight / Neutral / Permanent**
VP5	**Local road directly west of the Site at Newtown –** This is a brief view afforded through a gap in mature vegetation afforded from an otherwise heavily contained section of local road in the townland of Newtown that represents local community receptors. While the roadside vegetation is dense and well-treed, there are intermittent views to the west, over the Carrigower River corridor. One such location is depicted here, with sloping fields and lines of mature trees layering to the low rolling pastoral context in the distance. There are two existing quarry sites in the view, the nearest 420m from the viewpoint.	**Medium-low**	The Proposed Development will be briefly visible along the sloping terrain some 400m east of the Site. It is important to note that residential dwellings in this linear cluster afford pleasant open views of the Carrigower River and beyond towards the rolling rural context. The Proposed Development represents a narrow band across the midground of the overall view afforded from this landscape context. Nonetheless, the partially visible Proposed Development will detract from the wider transitional and rural setting. Although the Proposed Development represents a visual intrusion on the view and will increase the intensity of development in the surrounding landscape context, the Proposed Development does not change the horizon or obscure views of the wider setting. Furthermore, although the Proposed Development may result in a clear change in land uses, it is not out of keeping in this setting where other extractive land uses are also	**Moderate / Negative / Medium-term**	**Slight / Negative / Permanent**

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
			visible. Overall, the magnitude of the effect is deemed Medium. The proposed native screening planting will be discernible from here above the upper lip of the quarry void. This mitigation planting will serve to screen much of the main quarry, however the cut entrance will remain visible. This is located within the context of the former extraction activities to the north of the Site. Therefore the mitigation it will serve to screen and soften the main view of the quarry and anchor the site into this landscape context. Thus, the residual magnitude of the effect is reduced to Low.		
VP6	**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 / Permanent**

14.6 Proposed Mitigation Measures

The main mitigation by avoidance measure is the siting of the Proposed Development in a contained landscape context that avails of 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 retain a ca. 5m wide bench along the edge of the site boundary which 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.

14.7 Cumulative and In-Combination Effects

The main cumulative effect in this instance is related to the in-planning Deerpark Quarry located to the east of the Proposed Development. Although there are existing quarries and sand and gravel pits within the surrounding study area, these 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, restricted to the in-planning Deerpark Quarry.

This Proposed Development is located c.430m to the west of the in-planning Deerpark Quarry. The two developments are separated by the Carrigower River corridor and consequently located on opposite sides of the transition between the open rural landscapes of the western study area and sloping transitional landscapes of the eastern study area. The cumulative landscape and visual impacts of the Proposed Development with Deerpark Quarry is somewhat mitigated by the generally screened nature of the Whitestown development. However, where the two are visible within the same context, such as the N81 in the north of the study area, or residences at Whitestown Upper in the east of the study area, the more open visibility of Deerpark will add context and a sense of scale to the Proposed Whitestown Development. While the proposed Whitestown Development is generally screened, and therefore limits visual effects to lower magnitudes, there will be a change in the wider landscape character, to feature a higher proportion of large scale extractive industries.

Overall, the cumulative landscape and visual impact of the Proposed Development is not considered to be significant.

14.8 Interactions with other Environmental Attributes

None identified.

14.9 Indirect Effects

The principal indirect effect of the Proposed Development generated during the operational phase of the Proposed 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 HGV traffic in the locality and would slightly detract from the sense of rural tranquillity in the immediate vicinity of the Site, however,

it should be noted that the immediate surrounds of the site are heavily influenced by the existing national primary route, which diminishes the potential for any notable effects to occur here. Overall, 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 marginally increase 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.

14.10 Residual Effects

Based on the landscape and visual impact judgements provided throughout this LVIA, effects generated by the proposed development are deemed not significant.

14.11 Monitoring

Ongoing monitoring of effects or mitigation measures is not considered necessary in this instance.

14.12 Difficulties Encountered

There we no difficulties encountered in the process of completing the LVIA.

15 INTERACTIONS OF THE FOREGOING

Description	Population and Human Health	Biodiversity	Land, Soils and Geology	Water	Air Quality	Climate	Noise and Vibration	Landscape and Visual	Cultural Heritage	Traffic
Population and Human Health		✓	✓	✓	✓	✓	✓	✓	X	✓
Biodiversity	✓		✓	✓	✓	✓	✓	X	X	X
Land, Soils and Geology	✓	✓		✓	✓	X	X	✓	X	X
Water	✓	✓	✓		X	✓	X	X	X	X
Air Quality	✓	✓	X	X		✓	X	X	X	✓
Climate	✓	✓	X	✓	✓		X	X	X	✓
Noise and Vibration	✓	✓	X	X	X	X		X	X	✓

Description	Population and Human Health	Biodiversity	Land, Soils and Geology	Water	Air Quality	Climate	Noise and Vibration	Landscape and Visual	Cultural Heritage	Traffic
Landscape and Visual	✓	X	✓	X	X	X	X		X	X
Cultural Heritage	X	X	X	X	X	X	X	X		X
Traffic	✓	X	X	X	✓	✓	✓	X	X	

16 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 detailed within the EIAR.
The Proposed Development will have 4 distinct phases during the construction stage: • Phase One: Commencement of Excavation in the northern section at a slope gradient of 1:1.5 down to 153mAOD with ca. 9,600m^3 of topsoil to be removed from an area of ca. 32,000m^2; • Phase Two: Creation of a bench at 153mAOD, with further excavation to the final quarry floor level of 143mAOD continuing at a 1:1.5 slope. Construction of a settlement pond in the northeast corner, a generator shed west of the pond and concrete. Phase Two will begin in the eastern section to allow for the installation of the infrastructure; • Phase Three: Commencement of excavations in the southern section with ca. 13,667m^3 to be removed from an area of ca. 45,555m^2; and, • Phase Four: Creation of a bench at 153mAOD, with further excavation to the final quarry floor level of 143mAOD continuing at a 1:1.5 slope.
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 on weekdays and 07:00 – 15:00 on Saturdays. This allows for the departure of HGVs loaded the previous day and ensures returning HGVs can access the Site at the end of the day.
The Proposed Development will utilise key existing ancillary infrastructure within the historic quarry, including the site office, weighbridge, wheel wash and on-site well. The site office within the former sand and gravel pit will provide welfare facilities for the Site. This building contains a canteen, toilet and sink. No additional welfare facilities are proposed as part of the Proposed Development.
No fuel will be stored within the Site. Re-fuelling of mobile plant will be carried out via fuel bowser.

Commitment
Biodiversity
The following mitigation measures will be incorporated and adhered to during the construction, operational and restoration stages 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 effects. The mitigation measures detailed within this EIAR will be fully adhered to; • The Site manager shall ensure that all personnel working onsite are trained and aware of the mitigation measures detailed within the EIAR; • If protected or notable species are encountered during operations at the Site, works will stop within the area that these animals are identified and the project ECoW will be contacted for advice; • Protected and notable species posters will be erected on the Site notice board and maintained throughout the duration of the works; and, • In advance of works, all site personnel will receive a toolbox talk regarding notable and protected species. Everybody working onsite must understand the role and authority of the ECoW. 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 the works are completed in line with the measures in this EIAR and wildlife legislation.
Hedgerows and Treelines The following protection measures will be adhered to during the works: • No materials, equipment or machinery will be stored within close proximity to retained hedgerows / treelines; • 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; and, • Notice boards, wires, etc. will not be attached to any trees. Additionally, guidance from Hedgerows Ireland [71] will be followed during the enhancement planting that will occur along the hedgerows bordering the south, east and west of the Site to protect these retained linear features, including the following: • Plant native, pollinator-friendly trees of Irish provenance; • Plant whips every 30cm in two staggered rows with a 40cm gap; and, • Maintain a 1-2 metre hedge margin for wildlife.

Commitment
Additionally, it should be noted that the Restoration Plan for the Site involves enhancing the existing boundary hedgerow / treelines and scrub management and tree planting within the Land Ownership boundary.
Badgers and Terrestrial Mammals Given the presence of a badger sett adjacent to the Site boundary the following mitigation measures should be adhered to, which are in line with the NRA (now TII) guidance for badgers: • Prior to the commencement of operations on-site an updated badger survey should be undertaken by the ECoW. This survey should focus on lands within the Site and the area of scrub to the east of the Site; • Annual badger surveys will be undertaken to confirm the absence of badger from the areas to be affected by the works; and, • If any badger setts are identified within 50m of the Site, the NPWS will be consulted with regards to the need for a derogation licence. Additionally, the following mitigation measures will protect badger and other terrestrial mammals including pine marten and hedgehog from disturbance: • Should the proposed works be required outside of daylight hours, the ECoW will be consulted as required; • Obvious mammal paths will be left clear of obstruction to allow for the free movement of smaller mammals throughout the landscape; • If unidentified burrows are identified within the works area during works, the ECoW will be contacted for advice; • The clearance of any vegetation on-site, including the central hedgerow, will be supervised by the ECoW; • Activities and deliveries to the Site will occur only during permitted hours; • All plant where possible shall be low noise rated; • Onsite policy for all plant and equipment, including Site delivery vehicles, to power off rather than to be left with idling engines; • All plant and vehicles on the Site will be in a fit condition for use, to prevent the addition of noise from maintenance issues; • Management of deliveries and vehicles to minimise vehicles idling on-site; • Careful selection of quiet plant and machinery to undertake the required work, where available; and, • Handling of all materials will take place in a manner which minimises noise emissions.
Bats As habitats suitable for foraging and commuting bats will be removed, the following measures will be put in place for bats within the vicinity of the Site:

Commitment
• Lighting will be installed on-site around the wheel wash, office, generator shed and wash plant at the Site entrance. This lighting will be directional and will be turned off at night. This will ensure that bats foraging / commuting around the boundary habitats are not impacted by lighting on-site; • An updated bat survey will be undertaken within the active bat survey season prior to the commencement of construction and vegetation clearance works to confirm the absence of roosting bats; • Two trees on-site have features suitable for roosting bats and one will be removed to facilitate the Proposed Development. Immediately prior to the removal of this tree, the ECoW will undertake an assessment of the tree to assess it for evidence of potential roosting bats including droppings, urine splashes and fur-oil staining; • The removal of the tree that has features suitable for roosting bats will be supervised by the ECoW; and, • Where possible, the PRF tree which will to be removed, should be felled on mild days during the autumn months of October – November or during spring months of February-March (felling during the spring or autumn avoids the periods when bats are most active and without young). Additionally, it should be noted that the Restoration Plan for the Site involves enhancing the existing boundary hedgerow / treelines and the creation of new habitats within the Land Ownership boundary.
Birds To ensure no effects occur to breeding birds as a result of the Proposed Development, the following mitigation measures will be put in place: • Any vegetation clearance required will take place outside of the nesting bird season (1st March to 31st August), as per Section 40 of the Wildlife Act 1976, as amended by Section 46 of the Wildlife (Amendment) Act 2000; • In the event that works need to be undertaken within the main breeding season, this would be undertaken in consultation with NPWS; • Should birds nest within the active working area during site operations, works within the area will stop within the area and the ECoW will be consulted; and, • If notable / protected bird species are identified colonising any areas to be affected by the works, 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. Additionally, it should be noted that the Restoration Plan for the Site involves enhancing the existing boundary hedgerow / treelines and the creation of new habitats within the Land Ownership boundary.
Otter The following measures will be implemented to ensure there is no disturbance to otters: • Activities and deliveries to the Site will occur only during permitted hours; • All plant where possible shall be low noise rated;

Commitment
• Onsite policy for all plant and equipment, including Site delivery vehicles, to power off rather than to be left with idling engines; • All plant and vehicles on the Site will be in a fit condition for use, to prevent the addition of noise from maintenance issues; • Management of deliveries and vehicles to minimise vehicles idling on-site; • Careful selection of quiet plant and machinery to undertake the required work, where available; and, • Handling of all materials will take place in a manner which minimises noise emissions.
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 [6] and the NRA guidelines for the management of noxious weeds and non-native invasive plant species [53]: • Acceptance criteria for the incoming materials would need to be adhered to as per the National By-Product Criteria Ref No. BP-N002.2024; • Sourcing material that is determined to be by-product prior to transport to the Site; • Pre-agreed source sites for inert material ensuring no invasive species are present; • The operator will have a documented waste recording procedure for all by-product material entering the Site; • No unauthorised dumping of waste will be allowed at the Site; • All vehicles, machinery and any other equipment used for the works will be washed prior to its use at the Site to prevent the import of plant material or seeds; • Before machinery or equipment is unloaded at the Site, equipment will be visually inspected to ensure that all adherent material and debris have been removed; • The staff on-site will be made aware of the dangers associated with cross-contamination of invasive plant species with soil; • Any vehicles and machinery that are not clean will not be permitted entry to the Site; • Clean, uncontaminated soil and stone by-products accepted to the Site will be free of invasive species (suitable evidence provided from the source site prior to agreeing to take the materials, which may include 'statement of conformity from the producer or a report from a suitably qualified ecologist or similar). The applicant will engage a suitably qualified and experienced practitioner to assess the evidence if necessary; and, • If high impact invasive species are identified on-site, including Japanese knotweed or Himalayan balsam, the ECoW will be contacted for advice.
Other Species The following measures will be implemented to ensure no effects to other species: • Should the proposed works be required outside of daylight hours, the ECoW will be consulted, as required; and,

Commitment
• If unidentified burrows are identified within the works area during construction, works will cease within the area and the ECoW will be consulted for advice.
Restoration Stage Following cessation of the quarry activities at the Site, a Restoration Plan for the Site will be implemented. The Restoration Plan will involve: • Restoring the Site to agricultural grassland and re-planting the central hedgerow that will be removed; • The settlement pond created during operations will be retained and enhanced to create a biodiverse waterbody on-site; and, • At the commencement of Site operations, the hedgerows bordering the south, east and west of the Site will be enhanced with native tree and shrub species for screening purposes It is considered once restoration plan is fully implemented, when the re-planted hedgerow / treeline becomes established and the settlement pond is enhanced to become a waterbody feature on-site that the Site will be more biodiverse than it was at the time of the field surveys.
Unplanned Events Ongoing ecological monitoring throughout the life cycle of the Proposed Development will ensure that any protected or notable species will be identified and that appropriate mitigation / preventative actions can be taken.
Land, Soil and Geology
Oil Storage/ Refuelling • The following mitigation measures will be applied, in accordance with the EPA (2006); • Re-fuelling of mobile plant will be carried out via fuel bowser; • A drainage line will direct runoff from the plinth through an oil/water separator before discharging into the water management pond; • all plant and machinery will be subject to refuelling procedures by a competent person utilising a drip tray; • No fuel will be stored on-site; and, • Absorbent sands and full spill kits will be stored within the Site.
Soil Management • Topsoil will be stored on-site and reused during Site restoration to reinstate productive land use.

Commitment
• Handling will be weather-sensitive, with segregation of soil types and minimisation of compaction during stockpiling to preserve soil structure and biological integrity. • Controlled excavation phasing, surface water management systems, and appropriate containment of stockpiles will be implemented to reduce erosion and sediment runoff. • Mitigation will include storage areas, oil-water separators, and designated refuelling zones to prevent soil contamination from spills or leaks. • The restoration plan includes the creation of wetland and grassland habitats, enhancing post-extraction land contributing to biodiversity. The stockpiling of excavated material will be required and will be appropriately managed on-site in accordance with best practice. All topsoil will be stored in designated stockpiles, with portions reserved for use during the future remediation and restoration stages of the Site. The removal and storage of topsoil will be undertaken in line with best practice guidance, including recommendations from the Department for Environment, Food and Rural Affairs [77]. The following mitigation measures will be adhered to: • The topsoil layer will be carefully stripped and stored separately in appropriately sited stockpiles to maintain its structure, fertility, and suitability for future restoration and landscaping. • Soil stripping and stockpiling operations will be avoided during periods of excessively dry or wet weather to minimise the risk of structural degradation and compaction; • Stockpiles will be clearly marked and segregated to differentiate between soil types and to ensure proper material handling during reinstatement stages; • Stockpiles will be managed to prevent unnecessary compaction, particularly within the core to avoid anaerobic conditions that may reduce the biological functionality of the soil; • Movement of construction traffic will be restricted to predefined haul routes to minimise disturbance and compaction of surrounding soils; and, • No soils will be transported off-site. All excavated topsoil will be retained for on-site restoration and landscaping purposes.
Water
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) [75], whereby: • Items of plant and machinery be refuelled by a mobile fuel bowser by a competent person utilising adequately sized and positioned drip trays on a concrete plinth in the Proposed Development adjacent to the generator shed. This plinth flows into an oil/water separator before reaching the settlement pond; • 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;

Commitment
• Unauthorised access will be 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; and, • Any spillage of fuel, lubricants or hydraulic oils will be immediately contained, and the contaminated soil removed from the Site and appropriately disposed of. The settlement pond will be inspected daily for the presence of hydrocarbons: • If hydrocarbon contamination is detected, any pumping of water to the wash plant from the pond 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 settlement pond will be inspected visually prior to pumping.
Air Quality
<u>Design Measures</u> The design measures to reduce dust will include: • Hedgerows surrounding the Site boundary will be enhanced during the initial phase of the Construction- Operational Stage and maintained until the end of the Restoration Stages. The hedgerows, once mature, should result in dense foliage; • Extraction of the Site will be done in phases which will help to reduce large areas of exposed soil reducing the risk of disamenity dust leaving the Site boundary; • HGVs entering/exiting the Site will occur via the existing wheel wash; and, Exposed surfaces, e.g. topsoil and overburden storage mounds, will be planted with fast-growing plants.

Commitment
Construction and Operational Stage The following mitigation measures will be implemented to minimise dust generation, during the Construction and Operational Stages: **General** • All dust and air quality complaints will be recorded, cause(s) identified, appropriate action taken; • Complaints log will be maintained at the Site office, available for review at any reasonable time; • Training will be to Site personnel on dust mitigation measures to be implemented at the Site; • Regular inspections of Site works will be conducted. The frequency of these inspections will be increased to coincide where the risk of impact is higher during dry and/or windy conditions; Good communications with the local community will be maintained.
Site Preparation • Soil stripping and overburden handling will be avoided during dry and windy (>5.0m/s) conditions; and • Overburden will only be worked when it contains a high moisture content.
Aggregate Processing • Screening will take place within sheltered parts of the quarry to reduce the likelihood of transport of dust via wind; • Material will be dampened during dry periods prior to crushing operations; • 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; • Clearance of any spillage during extraction will be undertaken regularly to minimise accumulation of loose dry materials; • Stockpiling of aggregate will occur within the quarry pit, hence providing some cover from the wind; and, • Minimisation of drop heights will be maintained.

Commitment
Vehicle Movements • Abrupt changes in vehicle direction will be avoided where possible; • Loaded HGVs will be covered during windy conditions (>5.0m/s) as practicable; • Regular clearing, grading and maintenance of haul routes will be conducted; • All vehicles will adhere to 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; • HGVs will pass through wheel wash prior to leaving the Site; and, • Road sweepers will be utilised to maintain local roads on a need-to basis.
Climate
The following mitigation measures will also be implemented during the works associated with the Proposed Development includes: • Reducing the idle times by providing an efficient material handling plan that minimises the waiting time for loads and unloads; • Turning off vehicle engines when not in use for more then 5-minutes; • Regular maintenance of plant and equipment; and, • The use of low-energy equipment.
Acoustics (Noise and Vibration)
No impacts have been considered likely and significant relating to vibration and as such mitigation measures for vibration have not been proposed.
Site Preparation Phase Prior to commencing development of the Site a CEMP will be prepared and agreed with the Local Authority. This will identify common noise control measures to be in-place during the construction stage of the project as outlined below: • Construction stage hours will be restricted to 07:00 to 18:00 Monday to Friday inclusive and between 07:00 to 13:00 hours on Saturdays;

Commitment
• Nomination of a responsible person to accept and respond to complaints; • Ensuring all plant and equipment is serviced and in good repair; • Inclusion of response procedure to noise complaints and noise breaches; • Planning of works to ensure drop heights from equipment are minimised to reduce noise generated; and, • Avoidance of plant or equipment left idling.
Operational Phase Noise The following mitigation measures will be in place as part of the Proposed Development: • All plant (fixed and mobile) is maintained to a high standard to reduce any tonal or impulsive sounds; • Vehicle speeds will be kept below 15km/hr within the Site. • All plant is throttled down or switched off when not in use; and, • Internal routes are reduced in gradients and routed to minimise noise emissions from vehicles onsite. Incorporating the above measures, and the mobile nature of the project works within the Site, the compliance at NSRs will be a noise criterion of: • $L_{Aeq,30min}$, 55dB from 08:00 to 18:00.
Restoration Phase Noise Plant operating hours will be from 08:00 to 18:00, Monday to Friday and 08:00 to 14:00 Saturdays. No activities will take place on Sundays or Public Holidays. The equipment associated with the Restoration will be mobile during the operational lifetime within the Site. This will aid in reducing noise emissions from the operations onsite to any individual receptor. The following mitigation measures will be in place as part of the Proposed Development: • 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. Incorporating the above measures, and the mobile nature of the project works within the Site, the compliance at NSRs will be complied with to a noise criterion of: • $L_{Aeq,30min}$, 55dB from 08:00 to 18:00.
Cultural Heritage

Commitment
The following mitigation measures will be implemented: • All soil stripping in areas 1 and 2 shall be monitored by a qualified archaeologist; and, • Any archaeological material identified during monitoring should be preserved by record under licence from the National Monuments Service in advance of development.
Traffic
Routine maintenance of the verge and hedgerow either side of the quarry's access on the N81 is required, and the existing sign will need to be relocated further north, so as not to interfere with existing sightlines.
Landscape and Visual
The main mitigation by avoidance measure is the siting of the Proposed Development in a contained landscape context that avails of existing screening in the form of existing hedgerow vegetation and surrounding mature treelines.

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