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ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR)

PERMISSION FOR THE EXTRACTION OF LIMESTONE AT ISERTKELLY NORTH TOWNLAND KILCHREEST LOUGHREA, CO. GALWAY

Applicant: Isertkelly Ltd.

Issued March 2025

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PREAMBLE

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SCOPE OF THE ENVIRONMENTAL IMPACT ASSESSMENT

Environmental Impact Assessment will be carried out by Galway County Council using the information and findings included in the EIAR. The planning and development regulations require the preparation of an EIAR and the scope has been the subject of consultation with Galway County Council and the Environmental Authorities which was undertaken in accordance with the current EIAR regulations as amended. A formal request has been made to Galway Co. Co. to provided scope for this but was not been provided yet. These regulations provide an indication of the need for an EIAR. The proposed development requires for Environmental Impact Assessment report and the scope has been agreed with Galway County Council arising out of preplanning consultation in accordance with the current EIA and Planning regulations.

Each report from various topics considers the following:

- ✓ Baseline studies
- ✓ Identification of potential impacts
- ✓ Evaluation and significance of those impacts
- ✓ Mitigation measures where required

The purpose of the mitigation measures is to ensure the that the development could be undertaken without creating any significant or unacceptable adverse impacts on the environment.

PLANNING POLICY FRAMEWORK

The subject site is within the administrative area of Galway County Council and the current County Development Plan 2022-2028 Our assessment demonstrates that the proposed development accords with the policies of the County development plan.

By their nature, aggregates can only be worked where they occur. The cost of haulage affects economic competitiveness in this sector and accordingly the extractive industries seek to locate in proximity to developing settlements and major existing and proposed

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roads, thus minimising haulage costs. Extractive industries can also give rise to detrimental environmental and residential amenity effects including traffic congestion, dust, noise/vibration, water pollution, visual intrusion and the effects on local road networks may also be significant. It is recognised extractive industry has an important function in the economy of the county and, furthermore, that the rural based nature of the quarrying/extractive industries offers opportunities for part-time farming to continue with quarrying providing valuable off-farm income. The Council recognises the importance to the economy of County Galway of mapping and identification of areas with aggregate potential, both in terms of cost-effective aggregates and avoiding sterilisation of resources. The Council will seek to identify the location of major aggregate deposits and will safeguard valuable un-worked deposits for future extraction. The Council seeks to ensure that the extractive and concrete products industry follows an environmental code of practice, in order to minimise potential adverse impacts on the environment and local communities.

EIA Portal Notification

A notification has been sent to the EIA Portal and a receipt of notification has been received with reference number 2025042. The complete application form and confirmation of receipt is included in Appendix L.

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LIST OF APPENDICES

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1. Proposed Planning Drawings
2. Table of Previous Plannings
3. Existing Survey Drawings
4. WWTS Report
5. Noise, Dust & Water Monitoring
6. Biodiversity
7. Land Soils (Geology)
8. Noise Modelling
9. Archaeology
10. Landscaping & Visual
11. Traffic
12. EIA Portal Registration

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CHAPTER 1

INTRODUCTION

INTRODUCTION

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1.1 INTRODUCTION

1.1.1 This Environmental Impact Assessment Report (EIAR) provides supporting information to accompany a planning application to Galway County Council submitted by Isertkelly Ltd, for expansion of existing limestone quarry in respect of their land at Isertkelly North townland, Kilchreest, Loughrea, Co. Galway

1.1.2 The application site extends to 12.66 hectares – refer to site locations maps and site layout maps in Appendix A

1.1.3 The proposed development being applied for under this current planning application is shown in Appendix A

1.1.4 The EIAR is made in accordance with the requirements of Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment and transposing national legislation.

1.2 THE SITE

1.2.1 SITE LOCATION

1.2.1.1 The lands which are the subject of this application comprise c12.66 hectares with an additional 7.4 hectares to be extracted located in the townland of Isertkelly North townland, (refer to Appendix A). Kilchreest, Loughrea, Co. Galway. The ITM coordinates for the site are 551888, 713166 the proposed development is located wholly within the red line.

1.2.1.2 The lands proposed for the extraction of limestone is accessed via a private road and enters onto a local road which is an authorised access. The site occupies ground with elevations ranging between 59m OD and 69m OD.

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1.2.2 SITE DESCRIPTION

1.2.2.1 The proposed operations comprise of the stripping and storing of existing topsoil & extraction of limestone; processing (crushing and screening) to produce aggregates for use in the manufacture of value-added products for road construction, production of concrete products and site development works. It is intended to return the extracted area to a natural habitat following completion of extraction.

1..2.2.2The application site relates to the site area only. Material extracted from the proposed land area is processed within the proposed extraction area using mobile processing plant.

1.2.3 SITE ACCESS

1.2.3.1 The site is located approximately 4.5km from Kilchreest and is accessed by a local road. (L8532)

1.2.3.2 The access to the proposed quarry will be via an existing Paved private road.

1.2.3.3 All traffic enters the site via the site office and weighbridge and runs over a macadam road surface up to the infrastructure area in the centre of the processing area.

1.2.3.4 All traffic exits the site via the weighbridge (located at the site office) and road referred to in section 1.2.1.2

1.2.4 SURROUNDING LAND USE

1.2.4.1 The site area is surrounded by agricultural lands (improved agricultural grassland and arable) and private dwellings.

1.2.4.2 Residences within the general area consist of one-off rural houses, farmsteads with some ribbon development along the local road network – refer to EIAR Chapter 4 Population and Human Health.

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1.2.5 THE APPLICANT

The applicant, Isertkelly Ltd. is the landowner and proposes if permission is granted to develop the facility in due course.

1.2.6 EIA SCREENING

1.2.6.1 Part 1 and Part 2 of Schedule 5 of the Planning and Development Regulations 2001 (as amended) set out the forms of development that require an environmental impact assessment report (EIAR).

1.2.6.2 Paragraph 2 of Part 2 of Schedule 5 refers to extractive industry and part (b) of that section states that the following requires an EIA.

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

1.2.6.4 The proposed extraction area of c7.5 Ha is greater than the default area of 5Ha for a mandatory EIA. On this basis the extraction area of the quarry exceeds the area stated under Part 2 and an EIAR is required.

1.2.7 EIA SCOPING

1.2.7.1 In preparing this Environmental Impact Assessment Report, consultations were had with organisations and agencies including:

- Galway County Council (Planning / Road & Environment Section).
- Geological Survey of Ireland (to discuss geological heritage)
- National Parks and Wildlife Service (in respect of designated natural heritage sites).

1.2.7.2 A pre-planning consultation meeting was held between officials of Galway County Council and Engineers from Collins Boyd along with the client Isertkelly Ltd.

1.2.7.3 Other consultations and informal discussions held by contributors in undertaking their environmental impact assessments are detailed in the specialist environmental sections of the EIAR together with details of relevant archives and documentation held by state agencies and organisations.

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1.2.8 DIFFICULTIES ENCOUNTERED WITH EIAR COMPILATION

This Environmental Impact Assessment Report was compiled on the basis of published regional and local data and site-specific field surveys. In general, no difficulties were encountered in compiling the required information. However, incidences where there were issues in accessing data are detailed in the various chapters.

1.2.9 ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR)

The principal objectives of an Environmental Impact Assessment Report are to:

- Identify and /or predict the significant effects / impacts of a development.
- Identify what mitigation measures should be incorporated into the development to eliminate or reduce the impacts.
- Interpret and communicate the above information on the impact of the proposed development, in both technical and non-technical terms.
- inform the Planning Authority in the decision-making process with respect to the associated planning application.

1.2.10 FORMAT OF THE ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR)

1.2.10.1 The EIAR shall identify, describe, and assess in an appropriate manner, in the light of each individual case the direct and indirect significant effects of a project on the following factors,

(a) Population and human health.

(b) Biodiversity with particular reference to species and habitats protected under directives 92/43 EEC and2009/147/EC

(c) Land, soil, water, air & climate

(d) Material assets, cultural heritage and the landscape

(e) The interactions between the above

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1.2.10.2 In preparing this document the contributors had regard to the Guidelines on the Information to be contained in EIAR published by the EPA in May 22. They also had regard to 2014/52/EU the directive on the Assessment of the effects of certain public and private projects on the environment (EIA Directive). The EIAR is sub-divided into fifteen parts. As an overview, they comprise of:

Chapter 1: Introduction / Screening / Scoping

An introduction to the development and a brief explanation of the aims and format of the EIAR. It also identifies the various professional consultants who have contributed to this EIAR and the screening / scoping process carried out.

1.2.10.3 Chapter 2: Project Description provides:

- details of the physical characteristics of the whole project, including, where relevant, demolition works, the land-use requirements during construction and operation as well asother works that are integral to the project.
- the main characteristics of the operational phase of the project e.g., nature and quantity ofmaterials and natural resources.
- residues and emissions produced during the construction, operational and restoration phases of the proposed development.

Chapter 3: Consideration of Alternatives

1.2.10.4 Chapter 3 provides a description of the reasonable alternatives studied by the applicant, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.

Chapters 4 – 15

1.2.10.5 These Chapters provide detailed information on all aspects of the existing (baseline) environment, identifies, describes, and presents and assessment of the likely significant impacts of the proposed project on the environment, recommends mitigation and monitoring measures to reduce or alleviate these impacts and describes the residual impacts and conclusions. They are grouped under the

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following Chapters:

- Chapter 4 Population and Human Health
- Chapter 5 Biodiversity
- Chapter 6 Land, soils & Geology
- Chapter 7 Hydrology and Hydrogeology (water)
- Chapter 8 Air Quality & Dust
- Chapter 9 Climate
- Chapter 10 Noise & Vibration
- Chapter 11 Material Assets
- Chapter 12 Cultural Heritage
- Chapter 13 Landscape & Visual Impact Assessment
- Chapter 14 Traffic Impact Assessment
- Chapter 15 Interactions

1.2.10.6 The associated references, plates, figures and appendices are provided at the end of the report.

1.2.10.7 A "Non-Technical Summary of the Environmental Impact Statement", incorporating the above chapters, is provided as a separate and self-contained document.

1.3 CONTRIBUTORS

1.3.1 Isertkelly Ltd. appointed Collins Boyd Engineers & Architects to prepare this Environmental Impact Assessment Report (EIAR) in support of its Planning Application for the proposed development at Isertkelly North townland, Kilchreest, Loughrea, Co. Galway.

1.3.2 The contributors who have assisted in the preparation of this EIAR are identified in Table 1-1 below. Each contributor has the appropriate qualifications, experience, and competence for their topic.

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TABLE 1 – 1 LIST OF CONTRIBUTORS

TOPIC	CONTRIBUTOR	COMPANY
Introduction	Eamon Collins Chartered Engineer FIEI	Collins Boyd Engineers& Architects
Description of Development	Eamon Collins Chartered Engineer FIEI	Collins Boyd Engineers& Architects
Consideration of Alternatives	Eamon Collins Chartered Engineer FIEI	Collins Boyd Engineers& Architects
Population and Human Health	Eamon Collins Chartered Engineer FIEI	Collins Boyd Engineers& Architects
Biodiversity	Paula Farrell	Panther Environmental
Land, Soils and Geology	Darragh Musgrave Senior Geo Environmental Scientist	Viridus Consulting Ltd
Hydrology	Anthony Cawley	Hydro Environmental Ltd.
Air Quality & Dust	Mervyn Keegan B.S.c M.S.c MIoA	Aona Environmental
Climate	Mervyn Keegan B.S.c M.S.c MIoA	Aona Environmental
Noise and Vibration	Mervyn Keegan B.S.c M.S.c MIoA	Aona Environmental
Material Assets	Stephen Boyd Chartered Engineer MIEI	Collins Boyd Engineers & Architects
Cultural Heritage	Martin Byrne	Byrne Mullins & Associates
Landscape	Ronan Mac Diarmada	Ronan Mac Diarmada & Associates
Traffic and Transport	Richard Frisbie	Roadplan Consulting Ltd
Co-ordination of EIA	Eamon Collins Chartered Engineer FIEI	Collins Boyd Engineers & Architects

1.3.3 Each contributor has been fully briefed about the proposal and the background to it. They have also visited the site and are familiar with the local environment.

1.3.4 Collins Boyd Engineers & Architects have been preparing Environmental Impact Assessment reports(previously EIS) relating to quarry developments since implementation of the EIA Directive in 1990.

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CHAPTER 2

PROJECT DESCRIPTION

2.1 PROPOSED DEVELOPMENT

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2.1.1 DEVELOPMENT OVERVIEW

OPERATIONAL PHASE (LIMESTONE EXTRACTION AND PROCESSING)

2.1 The proposed development being applied for under this current planning application is shown in Appendix A. This section of the EIAR describes the development proposal by Isertkelly Ltd. comprising of the continuation and extension of an existing quarry in the townland of Isertkelly North townland, Kilchreest, Loughrea, Co. Galway development under planning ref no. 05/2870.

2.2 This section also describes the existing quarrying activity, including a brief description of the current infrastructure at the site and summarises previous planning applications for the site.

2.2 Extraction of rock & stone with processing of the extracted material in preparation for use in the construction industry, the extracted material from the lands will be processed within the lands/site.

Planning permission is sought by Isertkelly Ltd. for the extension of an existing quarry, together with all ancillary site works and services, in the townland of Isertkelly North townland, Kilchreest, Loughrea, Co. Galway.

The existing quarrying activity will remain as is and the existing site infrastructure including weigh bridge and roads will broadly remain in same location with new site office building, weigh bridge office and maintenance shed to be constructed.

This EIAR is to be submitted to Galway County Council in support of an application for planning permission for the proposed development, as described above, under the Planning and Development Regulations 2001 (S.I. No 600 of 2001)

PLANNING HISTORY

The current quarry operations have been developed under planning ref. 052870 which was granted permission 15/09/2005.

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Previous planning applications relating to this site are provided in the table included in Appendix B.

EXISTING OPERATION, INFRASTRUCTURE & UTILITIES

The existing quarrying activity and existing infrastructure, management and control systems will be reviewed to incorporate up to date practices. infrastructure including weigh bridge, wheelwash and roads will remain.

There will be no proposed alterations to the existing infrastructure, management, or control systems as part of the proposed development.

The site provides employment for approximately 18 to 22 personnel, depending on demand (3 administrative staff, 3 to 4 operators/ maintenance personnel and 12 to 15 drivers).

The hours of operation of the quarry are 08:00 hrs to 18:00 hrs, Monday to Friday and 08:00 hrs to 16:00 hrs on Saturdays. Truck loading activities can be undertaken between the additional hours of 07:00 and 08:00 Monday to Saturday. In accordance with condition 5 of planning ref. 05/2870

The current permitted extraction area is approximately 3.06 ha Approximately, the extraction depth permitted is 80m below original ground levels.

RESTORATION

2.3 Upon the cessation of extraction operations it is proposed to restore the site to a natural habitat.

2.4 Where feasible, restoration of exhausted and redundant areas will be carried out at the earliest opportunity. However, it is envisaged that the majority of restoration proposals will be carried out after extraction operations at the site have ceased.

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AGGREGATE RESERVE ASSESSMENT

2.5 The total recoverable reserve of limestone rock within the proposed extraction area is assessed at c 1.33 million m³

DURATION OF EXTRACTION

2.6 An outline of the proposed extraction plan and the final ground levels is shown in site layout plan drawings in Appendix A.

Table 2-1 Material Quantities

Material	Quantity
Topsoil / Overburden	22,500 m³
Rock	1.33 million m3

2.7 The duration of quarrying activities at the application site will largely be dictated by the rate at which the approximately 1.33 million m^3 of material is extracted from the site. There are many factors which will influence this, including, but not limited to the:

- Prevailing economic climate and related construction industry output
- Distance of construction projects from the facility (and scale of activity)
- Demand for quarry related products.

2.8 In light of these and other variables, calculation of intake rates and duration is not an exact science. It is anticipated that the average annual extraction rate will be 120,000 tonnes

The extraction operation is carried out as follows:

1. Overburden is stripped as required ahead of the working face of the quarry using a tracked excavator. The depth of overburden encountered thus far is a maximum of

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c.300mm, consisting mainly of topsoil material. Those soils which have not been used in the erection of boundary earth berms are stockpiled onsite for eventual reinstatement. Earth berms have been planted to promote rapid stabilisation of soils. Some earth berms will be removed and reinstated along new site boundary, these berms will be planted as outline in proposed landscaping drawings.

2. Limestone is extracted from the working face using controlled blasting.
   Blasting is carried out by a contracted blasting expert approximately every 2- 2 ½ months based on demand. Charge holes are drilled into the rockface over 1-2 days, whereupon charges are placed and detonated in-series to deposit rock onto the active quarry floor. Charge type and sizes are selected by the blasting expert to environmental and health and safety criteria and taking account of conditions 7 and 8 of planning ref. 05/2870.

3. Oversized blasted stone is broken further using a tracked excavator mounted with a hydraulic rock breaker.

4. Broken stone is processed further using a mobile crushing machine. Crushed stone is transferred via the output conveyor to a mobile screening machine which separates the crushed stone into the required grades.

5. Graded stone is stockpiled within the quarry pit floor and service yard. Stone products include stone, chips, blinding and clause 804 aggregates.

Stone is provided to customers for agricultural, forestry, building development and road construction projects as requested.

Aggregate washing is not carried out at the site, however, 804 fill material is sprinkled with water to allow it to achieve optimum performance under heavy loading (for use on roads, driveways etc.).

Dewatering of the lower benches of the quarry may be required especially during winter flood periods, this water will be disposed of within the site through a proposed soakaway to be constructed under the carpark/ truck parking as indicated on the site layout plan drawings contained in Appendix A.

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Truck weighing is carried out at the weighbridge and recorded at the weighbridge offices.

EXISTING MITIGATION INFRASTRUCTURE

Existing Mitigation Infrastructure

- Stone crushing and screening is carried out on the pit floor in order to avail of the noise and dust mitigation provided by the quarry walls and surrounding berms. Stone stockpiles are also stored within the quarry floor in so far as is possible. Water sprinklers are in place for stockpiles in order to provide for additional dust suppression when required.

- A 6m wide bitumen macadam access road from the main road to the weighbridge has been constructed, providing lower potential dust generation from unsurfaced trackways. Roads are wetted during dry conditions in order to aid in dust suppression via a water bowser.

- Loads containing fines are required to be covered when exiting the site.

- Internal and public roads are swept when required (road sweeping / street cleaner).

EXISTING SERVICES

- There is no general stormwater pipework or management system at the site. All rainfall that falls within the footprint of the quarry infiltrates into the services area

floor or the quarry floor and migrates vertically down to the water table. There is no discharge to surface-water from the quarry.

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- There is a well onsite which provides water for dust suppression, 806 grade fill wetting, and quarry office toilets.

- The quarry office toilets discharge to a sewage treatment system located within the site close to site offices, the condition of this treatment system has been recently assessed, and the report is included in Appendix D.

ENVIRONMENTAL MANAGEMENT

Environmental Management at the site is carried out in compliance with legal requirements and under the conditions of previous planning application 05/2870. This planning decision provides general obligations for the site to maintain various aspects of the environment and amenity of the site and surrounding area, as well as specific requirements for the monitoring of potential impacts from the quarrying activity.

An environmental noise monitoring programme is in place for the assessment of noise amenity at noise sensitive receptors in the vicinity of the quarry activity. Noise monitoring is carried out quarterly in the vicinity of the site.

The noise limits for the site are as follows:

Noise Limit (monitoring duration)	Applicable period
L_{Aeq} 55dBA (60 minutes)	8:00hrs -18:00hr
L_{Aeq} 45 dBA (15 minutes)	18:00 hrs – 08:00 hrs

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Each blasting event is required to be monitored at the boundary of the quarry. Blasting operations are limited to within the hours of 09:00 hrs to 18:00 hrs Monday to Friday, excluding public holidays, bank holidays and weekends.

An air pressure limit of l 25dB is applied to blasting activities at the site. A peak particle velocity (PPV) limit of 12 mm/s is in place for vibration at the nearest premises.

The results of recent noise monitoring at the site are contained in Appendix E.

Dust monitoring is carried out at three monitoring locations on the boundary of the quarry extraction area, Dust monitoring is carried out quarterly. A limit of 350 mg/m2 over a 30 day monitoring period is in place for the site, in accordance with the guidance document BPA (2006) Environmental Management in the Extractive Industry and Gennan TA Luft Air Quality Standard (Bergeroff).

The results of recent dust monitoring at the site are contained in Appendix E

The operator is required to record all complaints, including;

- the name of the complainant,
- nature, time and date,
- actions taken to deal with the complaint,
- the results of such actions,
- the response to each complainant,
- a summary of the company's investigation and response.

There have been no environmental complaints recorded to date at the quarry activity.

PROPOSED DEVELOPMENT

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OVERVIEW

The applicant, Isertkelly Ltd. is requesting a 25 year planning permission for continuation of an existing quarrying operation and a 7.5 hectare extension for extraction of an average of 120,00 tonnes per annum including all ancillary site works in the townland of Isertkelly North, Kilchreest, Co. Galway.

A site location map and a site layout map for the development is provided in Appendix A of this EIAR. There are no proposed amendments to the current inputs, processes or outputs at the existing quarrying activity as part of this application, other than the proposed extension of the activity boundary and extraction areas.
The proposed development could be described as a continuation of the current quarrying activity in term of scale and methodology.

The approximate depth of excavation will be to 40m below existing ground levels this is substantially less than the previous planning which permitted extraction to an approximate depth of 80m below existing ground levels.

The site area of the proposed development will increase to 12.66 hectares., 7.5 hectares of this will be increased extraction area.

The proposal includes 2.5m (high) x 5m (wide) boundary earth berms surrounding the proposed quarry extension. The berms will be planted with a mixture of native species trees, which will visually screen the site and will reduce the amount of noise and dust leaving the site

The volume of stone within the proposed 7.5 ha extraction area has been estimated to be 1.33 million m^3. At an estimated density of 1.8 tonnes/ m3, this would equate to an estimated reserve of 2.394 million tonnes.

The quarrying excavation operation would progress in a westerly and southerly direction from the existing quarry boundary.

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CLOSURE, RESTORATION & AFTERCARE

CRA for the Existing Quarry Area

Previous and current trial digging has found overburden depths of 25mm to 300mm across the proposed excavation areas. Assuming an average overburden depth of 175mm, the following estimated quantities of overburden would be available for reinstatement:

Table 2.3: Estimated stockpiled overburden volumes

Phase	Area (ha)	Overburden Volume (m3)
Proposed Extraction	7.5	22,500
Required for berms	.5	-6,800
Total	**8.0**	15,700

It is noted that, in addition to the above stored overburden, some of the extracted stone is not of a sufficient commercial grade. This material is also stored onsite and would be used in the restoration of the site. It is also noted that some of the existing removed overburden has been used to create berms on the boundaries of the extraction area these berms will be planted with native trees and will remain in place as part of restoration plan.

The ledges formed by the setting back of the quarry faces will be covered with soil and will naturally regenerate with native species. All roadways down to quarry floor will also be covered with topsoil.

The approach would allow for the establishment of flora of local provenance and would provide some open spaces required for foraging, whilst providing some cover for a variety of species.

The following would be carried out on final cessation of quarrying activities;

1. Removal of all plant and machinery.
2. Ripping up of any hardcore, macadam or concrete surfaces to a depth of 300mm,

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3. Fill in with clean stone or remove any sub surface tanks,
4. Re-spreading and grading of any remaining stone/ overburden/ topsoil materials available on site.
5. The lower parts of the quarry will fill with ground water forming a pond
6. Due to the hazard of cliff faces and deep water the site will be left secure so that the general public and unable to gain entry.

All the work would be carried out by front loaders and excavator, including soil / stone movement and soil preparation. These works will be carried out in accordance with existing restoration plan or any future agreed restoration plan.

OBJECTIVES AND MEASURES FOR THE PROMOTION OF BIODIVERSITY DURING RESTORATION

Reinstatement Objectives

The development of the quarry extension will result in the loss of habitat for certain floral and faunal species but will provide habitats for other species. For example, there will be a nett loss of grassland habitat during operation, however there will be additional habitat provided for the protected species which utilise active quarries such as Sand Martin, Peregrine Falcon, amphibians etc. The objective during reinstatement is to restore some of the habitats that will be removed by the proposed development whilst retaining important habitats which developed during the operation of the quarry. This will require active management of the existing quarry and proposed extension area during the reinstatement process and in subsequent years.

The key objectives are as follows:

1. Natural recolonisation is generally preferred to large scale planting.
2. Control of invasive species on an ongoing basis.
3. Specific measures that are targeted towards certain key ecological receptors including, Sand Martins, Badgers and bats.

4. Maintenance/restoration of commuting routes/green corridors in the context of the wider landscape
5. Provision of new habitats.

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Specific Measures Quarry faces

Cliffs in quarries can be important ecological elements in the wider landscape. Following decommissioning, there will be multiple faces of various heights within the quarry and along its boundary. The outer perimeter of the site will be fenced to ensure they do not create a hazard and will be left largely intact. The faces are not visually intrusive in the context of the local landscape and will naturally become colonised by vegetation over time. Such faces can provide nesting habitat for birds including ravens, peregrine falcons, etc.

Recolonisation and additional planting

It is noted that some planting of specific areas is proposed as detailed below. However, in general natural recolonisation will be allowed to proceed. This will ensure that such areas are colonised by a mixture of native species from the surrounding landscape. These species will be appropriate to the local conditions. In general, the use of wildflower mixes and extensive planting is not recommended, as natural recolonisation is considered a more effective means of revegetating a disturbed site.

New planting is recommended along external boundaries where is also serves a screening function. This will also provide enhanced foraging habitat and green corridors for bat and birds.

SITE SCREENING

2.9 Given the location and topography of the site it is unlikely that this development will be unduly prominent. The proposed planted soil berms to the perimeter of the site will mitigate against the visual impact.

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REMOVAL OF TOPSOIL AND OVERBURDEN SOILS

2.10 Any topsoil and overburden not used for the construction of perimeter berms will be stockpiled and will be used in the restoration of the quarry in a phased basis in order to return the application area to a natural habitat.

SITE DRAINAGE

2.11 A hydrological / hydrogeological assessment has been carried out taking into consideration the existing water regime at the site. It addresses mitigation measures to eliminate and/or minimise the potential impacts, if any, on surface water and groundwater – refer to Chapter 7 – Hydrology and Hydrogeology (Water)

STABILITY OF THE QUARRY

2.12 Industry standard slope angles, bench heights, and bench widths will be used for extraction operations at the site, and these will be assessed in conjunction with the nature of the materials extracted on a ongoing basis.

METHOD OF EXTRACTION

2.13 The material will be extracted by means of blasting and use of excavators and dump trucks. Rock inverts are indicated in the borehole drilled on site used to establish water table, rock levels, physical & chemical information relating to the underlying materials. This information allows the various experts make informed decisions based on science and engineering.

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PROCESSING METHODS

2.14 The processing of the extracted Rock, into aggregate products, will consist of crushing and screening by mobile processing plant within the application area.

QUARRY WORKING HOURS

2.15 In accordance with the current planning (PD 05/2870) on site operations, other than blasting operations will be carried out between the hours of 08:00 and 18:00 only, Monday to Friday inclusive, and between the hours of 08:00 and 16:00 on Saturdays. Truck loading activities can be undertaken between the additional hours of 07:00 and 08:00, Monday to Saturday, inclusive. Blasting shall be confined to 09:00 and 19:00 Monday to Friday.

SITE ROADS, PARKING AND HARDSTANDING AREAS

2.21 All HGVs utilising the quarry will be confined within the Applicant's landholding.

- Trucks turn into site from the local road and access the site as described above.

2.22 Adequate car parking provision for employees and visitors is indicated on the site layout plan. Truck parking is provided on site as indicated on the site layout drawing.

WEIGHBRIDGE

2.23 In order to track and record the amount of material exiting the quarry, all HGV traffic is directed across the existing weighbridge, the location of which are also indicated on the Proposed Site Layout Plan (Sheet 3) drawing no. 23.129-013 (refer to Appendix A).

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OFFICES AND ANCILLARY FACILITIES

2.24 An office building is proposed which will replace the existing prefabricated buildings, this new building will include offices, toilets, changing room and canteen. Other new structures will include refuelling pad, fuel tank, carparking, truck parking, maintenance shed and weigh bridge office. There is an existing weight bridge and wheel wash on site.

2.29 Given the lack of combustible waste materials at this site, it is considered highly unlikely that a fire will break out during quarry operations. A range of fire extinguishers (water, foam and CO2) will be kept at the site office to deal with any localised small-scale fires which might occur. Additional fire-fighting capacity can be provided by storing water in a mobile bowser on unsealed hardstand areas around the infrastructure area. A fire safety certificate will be obtained for the proposed premises and a fire safety management plan will be prepared in conjunction with this and the operation of the quarry.

LIGHTING

2.30 Sufficient lighting is to be provided at the site to ensure safe operations during winter periods. It is expected that any lighting installed will not have much use as the quarry will generally only work during daylight hours. Refer to site Layout Plan drawings in Appendix A for details on proposed site lighting.

FUEL AND OIL STORAGE

2.31 There is a bunded fuel tank provided adjacent to the proposed refuelling pad. Fuel oil will be delivered to site via fuel truck and mobile machines will fuel atop an impermeable fuel pad as shown on the site infrastructure drawing and the mobile crusher during its presence will be fuelled in-situ within the extraction area. All precautions such as training spill kits will be in place to ensure no risk to the

environment.

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LANDSCAPE AND BOUNDARY TREATMENT

2.32 Secure stock proof fencing will be erected at the quarry site along all perimeter boundaries, where required. Prior to any development within the permitted extraction area a survey of the entire property boundary will be undertaken and where necessary, new boundary fencing will be erected, existing fencing will be repaired and/or replaced and hedgerows will be strengthened or fortified by additional planting.

WASTE MANAGEMENT

EXTRACTIVE WASTE MANAGEMENT

2.33 Almost all products and by – products arising from the aggregate processing have commercial value. Any waste materials from the site are stored, collected, recycled and or disposed of in accordance with any requirements of Galway County Council.

GENERAL WASTE MANAGEMENT

2.34 The client will operate in accordance with the current codes of practice and the current waste management regulations. The guidelines states:
"minimise production of waste and where appropriate consider its beneficial use including recycling. The facility operator will deal with all waste in accordance with the relevant legislation and other controls in place, including using waste contractors with valid Waste Collection Permits.

2.35 Potential waste produced and the measures used to control it are described as

follows:-

- Domestic Style Waste (Canteen Waste) – domestic waste generated at the offices and employee's facility will continue to be collected by a licensed waste collection contractor, bi-weekly.

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ENVIRONMENTAL CONTROLS

GENERAL

2.36 Extraction, processing and ultimately restoration activities at the application site require a number of environmental controls to eliminate or minimise the potential nuisance to the public arising from the extraction and processing operations. The environmental control measures required at the site are outlined in the relevant EIAR Chapters.

2.37 Any additional control measures, which may be instructed on foot of the proposed planning application will also be implemented.

BIRD CONTROL

2.38 As the process of rock extraction is free of putrescible (food/kitchen) waste, site activities are unlikely to attract scavenging birds such as gulls and crows for the duration of works. Accordingly, it is not intended to implement any specific bird control measures on site.

TRAFFIC CONTROL

2.39 As the planning application relates to the extraction of limestone all traffic will use the private road and use the local road on entering and exiting the site. The intensity of traffic can be controlled by the site office and there will be no queueing on the public road. The established road use hierarchy of the network will continue

for any future permitted quarrying.

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LITTER CONTROL

2.40 As the proposed development will be largely free of litter, the daily operational activities are unlikely to give rise to problems with windblown litter. Accordingly, there is no requirement to implement ay specific litter control measures at the site.

2.41 In the unlikely event that any litter waste is identified, it will be immediately removed off- site to anauthorised waste disposal or recovery site.

Odour Control

2.42 As stone extraction activities at the site are not biodegradable and do not therefore emit odorous gases, site activities do not give rise to odour nuisance. No odour control is required.

VERMIN CONTROL

2.43 As the proposed development is free of putrescible (food / kitchen) waste, on-site activities will not attract vermin for the duration of the extraction or subsequent restoration operations. Accordingly, no specific vermin control measures are required.

FIRE CONTROL

2.44 In the unlikely event that a fire does occur, the local fire station in Loughrea will be contacted and emergency response procedures will be implemented. Fire extinguishers (water and foam) are provided at all offices to deal with any small outbreaks which may occur. A fire safety Certificate will be obtained from Galway County Council for the replacement building.

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DUST GENERATION AND CONTROL

2.45 In dry, windy weather conditions, site activities may give rise to dust blows across and beyond the existing or planned development site areas.

2.46 The incidence of fugitive dust outside of the operation is reduced by some of the mobile crushing and screening plant being located within the quarry void. Generation of fugitive dust is generally limited to periods of very low rainfall (refer to Chapter 8 – Air Quality). Dust generation occurs from three main sources.

- Point sources – such as operating plant and machinery
- Line sources – such as roads and conveyors
- Dispersed Sources– such as quarry floors and stockpiles

2.47 In order to control dust emissions, the following measures will be implemented: -

- Water will be sprayed from a tractor drawn bowser on dry exposed surfaces and stockpiles (paved roads, unsealed haul roads and hardstand areas)
- Continuation of the provision of a fixed sprinkler system along the internal road from the site access to the office.
- Areas of bare or exposed soils will, insofar as practicable, be kept to a minimum.
- The amount of dust or fines carried onto the public road network will be reduced by periodicsweeping of internal paved site roads and surrounding public roads as required.
- Emission of fugitive dust from machinery such as processing plant will be minimised by utilising dust suppression and by locating such plant within the quarry area.

2.48 Dust deposition monitoring will continue to be carried out when the quarry is operational as part of the environmental monitoring programme. Monitoring results will be submitted to Galway County Council on an annual basis – refer to EIAR

Chapter 8. Air Quality and Dust

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2.49 Mitigation measures are provided in accordance with the DoEHLG (2004) guidelines for the sector and EPA (2006) , refer to EIAR Chapter 8 – Air Quality and Dust

NOISE GENERATION AND CONTROL

2.50 The sources of noise located within the planning application area are primarily related to machinery / plant operation.

2.51 The potential for noise generation from the planning application area is reduced by locating some of the mobile crushing and screening plant at the lowest practical level. This means that the potential for noise generation from activities associated with the operation of the plant such as movement of vehicles and maintenance will be reduced – refer to Chapter 10. Noise & Vibration

2.52 In addition to the above the following good house-keeping measures are put in place to reduce noise emitted from plant and machinery as much as possible.

- All machinery used will be CE certified for compliance with EU noise control limits
- The machinery will be regularly maintained. This includes regularly checking any muffler systems and servicing or replacing as required. It also ensures any loose or damaged panels or covers that suppress noise is fixed or replaced immediately.
- If there are further noise-reducing modifications available for any machinery, they will be fitted wherever practical (eg: rubber decked screens, rubber chute linings etc)
- Haul road grades are kept as low as possible (</= 1:10) to reduce engine / brake noise from heavy vehicles.

2.53 Mitigation measures are provided in accordance with the DoEHLG (2004) and EPA (2006) guidelines for the sector.

2.54 The noise monitoring programme at the site will continue and ongoing noise monitoring will be carried out as part of the environmental monitoring programme. Monitoring results will be submitted to the County Council on an annual basis. It is intended that noise monitoring will be carried out in conjunction with adjoining development, if such a situation arises.

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ENVIRONMENTAL MONITORING

GENERAL

2.55 The site will continue to have an environmental monitoring programme on site - Water, noise & dust monitoring will be carried out on a regular basis, to demonstrate that the development is not having an adverse impact on the surrounding environment.

WATER MONITORING

2.56 A water monitoring well was installed as part of the Hydrogeological assessments, and these will be monitored by an independent lab and the results will be submitted to Galway County Council as required for review and comment.

SITE MANAGEMENT AND SUPERVISION

2.57 The worked-out areas will be restored to a natural habitat, relevant staff will be briefed on the scheme and will be adequately supervised / controlled. A system of record keeping for the key restoration activities will be put in place.

LONG TERM SURFACE WATER AND GROUNDWATER

2.58 There will be no drains or watercourses leaving the site, all surface water will percolate to ground, it is likely the lower levels of the worked quarry will flood forming a pond.

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DECOMMISSIONING OF PLANT AND MACHINERY

2.59 Redundant structures, plant equipment and stockpiles will be removed from site on permanent cessation of extraction activity. Machinery and buildings will either be utilised by our client on other sites or be sold as working machinery or scrap.

2.58 As part of the overall decommissioning process, all fuel, oil storage and septic / effluent treatment tanks within the existing site will be removed from the site by a licensed waste contractor. Therefore, there will be no potential for fuel, oil or sewage to cause long-term water pollution following completion of extraction activities.

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CHAPTER 3

ALTERNATIVES

3. ALTERNATIVES

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Consideration of Alternatives

3.1 Introduction

This chapter has been prepared using the EPAs guidelines on information to be contained in an EIAR (2002). The directive requires an applicant for consent to prepare description of reasonable alternatives which are relevant to the proposed project and an indication of the reasons the chosen option was selected. An analysis of high-level strategic alternatives are not normally part of a project level EIAR.

3.2 Consideration of Alternatives

The applicant examined all land in his ownership which have quarrying potential. The landowner owns 24ha in the immediate vicinity of the quarry. The preference for continued quarrying favours extension of existing facilities over greenfield set-ups. The site chosen for the application is immediately adjacent to the quarry permitted under 05/2870.

3.3 Proposed Levels

The permitted quarry has permission to excavate up to 80m below OGL. The productive area at this depth becomes small when benching and haul routes are accommodated and in the scenario of an extended quarry excavation depths less than 80m are more sustainable in terms of productive area and the reduced potential for dewatering. The balance has to be struck between maximising efficient working and reducing the loss of good agricultural land. The final chosen area has the following attributes:

- Proven qualities of usable materials
- Maintenance of present access to quarry
- Lower development costs as existing infrastructure is adequate see chapters 11 and 14 for further details.
- The proximity of the lands to major growth centres in Galway and a lesser extent in Clare and Roscommon.

3.4 Do Nothing Alternative

If quarrying is not to occur on these lands they will remain in agricultural use and the existing environment impacts will continue.

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3.5 Alternative Sources

The products of limestone quarries will continue to be used in construction. In this area land base sourcing of such materials has less environmental impacts than recycling waste or sourcing marine materials. The former because quality criteria are not widely accepted or applicable and the latter because of the nature of the material. Despite the proximity of Galway City the qualities of recycled material are not sufficient to meet the demands from planned development. The continuation of quarrying in established locations will continue to meet the construction needs of the area for the medium term which accords with the proposed lifetime of the quarry.

3.6 Alternative Sites/ Layouts

The applicant considered the potential for extraction over his entire landholding and different configurations and layouts within the landholding. The final choice was a balance between depth and area. The prospect of extraction over the whole land holding would when taken in conjunction with existing and adjacent development result in a super quarry which in terms of longevity could take up to 100years to work out at present rates of production. The environmental impacts could not be accurately predicted in such an expanded timespan nor could the regulatory frameworks that may emerge.

The direction of work in the quarry had 3 potential components north, west or south. The northern option is only viable in the context of a joint approach from adjoining landowners, moving south would increase proximity to the road and the nearest house, moving west would maintain separation from the road and the nearest house and would result in marginal increase in proximity to residences in the west but not so as to increase emissions significantly. The selection of a proposed excavation depth of 40m maximum was informed by the prospect of having the potential to continue similar levels of production and concurrently reduce the potential for de-watering to more manageable levels. The proposed extension phasing is shown below on Drg. No. 58.

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CHAPTER 4

POPULATION & HUMAN HEALTH

4 POPULATION & HUMAN HEALTH

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4.1 Introduction

This chapter examines the effects of the proposed rock quarry at Isterkelly North, Kilchreest, Co. Galway on population and human health.

4.2 Description

The description of the proposed development is outlined in detail in chapter 2 and it should be read in conjunction with this chapter.

4.3 Technical Guidance

The EPA Guidelines on information to be contained in EIAR (EPA 2022) were used as a reference in compiling this chapter. The chapter will consider population, employment, amenity and human health in the context of the environmental factors examined elsewhere in this report.

4.4 Consultations

There are no public consultations undertaken in relation to this chapter.

4.5 Preparation

This Chapter was prepared by Mr. Eamon Collins Chartered Engineer who is a director of Collins Boyd Engineering and has over 25 year's experience in managing and assessing the impacts of extractive industry projects.

4.6 Limitations

There were no difficulties encountered in preparing this chapter.

4.7 EIA Directives

The previous application for this quarry refers to human health and includes 'human beings' as the corresponding environmental factor, this is consistent with the 1985 EIA Directive. The 2011 directive was amended in 2014 which amends this factor to population and human health. The concept of human health is considered in the context of the other environmental factors examined in the EIAR. Standards used in the assessment including

dose, risk or exposure are in turn informed by medical and scientific investigation. This is the methodology through which protection criteria relating to the environment relates to human health.

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4.8 Study Area

This report includes the application site and the surrounding areas. The review of the population figures is based on the electoral divisions in the area and includes Kilchrest, Castleboy and Killogilleen. The county, regional and national figures are also given to provide context to the inter census changes

4.9 Receiving Environment

The study area has been outlined above in relation to population. In addition, it is proposed to examine the dwellings and other buildings in the vicinity with particular reference to those that have been constructed since permission was granted for a quarry in 2005. The sources of information for this include –

- Galway County Development Plan
- The other relevant Chapters of this Report
- CSO Census 2011/16/22
- OSI Mapping
- My plan

The quarry is located south west of Loughrea in the townland of Isertkelly North. The area is characterised by dispersed residential and farm buildings. There is an existing quarry site to the north which has been closed for the last few months. The lands aside from those outlined above are in agricultural use, mainly sheep and cattle grazing.

4.10 Environmental Designations

The site is not within or adjacent to any designated sites. There are Natura 2000 sites within 15 KM of this site, these are detailed in Chapter 5 of the EIAR. The proposed site is not within or adjacent to any NHA, or pNHAs. There are such sites within 10km of the quarry, these are outlined in Chapter 5 of the EIAR.

There are no recorded monuments within or adjacent to the site and investigations in the event of permission being granted will determine if any unknown archaeology exists. There are no buildings on the NIAH or the RPS in the vicinity of the sites.

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4.11 Population

The review of the population based on the EDs of Killogilleen, Castleboy and Kilchreest, the site is located in Castleboy

These have similar rural characteristics and are used for comparison. The area is also examined at a more macro level in the context of the county and regional population changes.

Table 4.1 Population

Population

Name	2011 population	2016 population	2022 population
Killogilleen ED	818	906	981
Kilchreest ED	312	303	307
Castleboy ED	550	537	571
Loughrea MD/LEA	different boundaries in each census		
Galway County	175,124	179,390	193,323
West Region (NUTS3)	445,356	453,109	485,966
NWR (NUTS2)	837,350	847,442	905,439
Ireland	4,588,252	4,761,865	5,149,139

The population figures show that Kilchreest and Castleboy have maintained constant population levels since 2011. Killogilleen has had an increase of 20%, most of this is located well to the north of the quarry so there is no significant increase in sensitive receptors in the immediate proximity of the quarry. The population increase could be explained by proximity to the city and extensive refurbishment of older properties. The overall population increase for county Galway is 10% which accords with the average increase over the 3 EDs.

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4.12 Unemployment

Row Labels	Galway City	Gort	Loughrea
Persons on Live Register			
2016 October	7016	983	1329
2017 October	6246	904	1286
2018 October	5212	766	1158
2019 October	4583	715	999
2020 October	4965	749	1038
2021 October	3900	573	747
2022 October	4826	618	828
2023 October	4437	545	771

The unemployment figures in the area shoe a steady decline since 2016. This is likely to stimulate demand for additional residential and commercial space which in turn will generate demand for quarry products.

4.13 Sensitive Receptors

The existing uses are shown on Fig. 4.1 and the centre of the proposed quarry is indicated by a large red circle. The proposed quarry is close to an existing dwelling to the south. This dwelling is currently vacant but action to bring it back into service is well advanced and a major refurbishment is proposed. There is very little residential development to the north of the quarry. The main locations for sensitive receptors are to the east and west of the quarry along the L8538. The extension to the quarry will be slightly nearer the dwellings to the east but will have the same boundary treatment as the existing quarry and changes in impacts between the existing and proposed will be very low. The nearest schools to the quarry are greater than 2.5km to the east and west of the quarry.

4.14 Impact Assessment and Methodology

The evaluation of the effects on employment and human health will be a qualitative process based on the guidelines and quantative assessments in the EIAR.

4.15 Employment

The proposed development will continue to provide direct employment for 6 people and indirect employment for up to 40 people. The latter group will include hauliers, machinery maintenance and service providers. They will contribute to the local economy and to a

lesser extent to the regional economy of Galway by providing sustainable construction materials for the planned growth of Galway City and County. These are medium positive effects which will endure for the life of the quarry. It is anticipated that on cessation the quarry will remain as it is and effectively become a nature reserve.

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4.16 Human Health

The key pathways to human health are soil, water, air and noise and these factors are examined in detail throughout the document, in chapters 6 – 10. On the basis of the findings and mitigation proposals in these chanters it is expected that there will be no adverse significant impacts during the extraction and restoration of the proposed development. Furthermore the existing quarrying on the site has to be subject to Environmental Managements Systems which demonstrate that the methodology and work practices employed have not impacted on human health. The level of activity proposed as part of this application will be less than the cumulative impacts arising up to summer of 2024 when the permitted quarry to the north ceased to operate. The productivity from the proposed quarry will show an increase from that permitted under 05/2870 but it will not be significant in terms of environmental impacts.

4.17 Unplanned Events

These types of events include fires, landslides, traffic collisions, floods, spillages or equipment failure. The EIA directive identified major accidents or natural disasters when considering unplanned events. The proposed development has a low risk of unplanned events. The development history of the quarry, since 2005 has not recorded any unplanned events. The processing proposed does not introduce any chemical or other materials into the process. The well-established techniques and regulations will maintain the low risk of unplanned events.

Chapter 7 examined spillage and potential impacts on water resources, traffic assessment has established that the road network using selected routes has sufficient capacity to accommodate the proposed development. The selected routes option have been established by the current permission and the application proposed to continue such in the event that permission is granted.

4.18 Cumulative Impacts

An examination of the planning register since 2016 indicates that outside of new residential development there are no sensitive uses permitted in the vicinity of the quarry. The permitted quarry to the north has ceased operation since this summer and its planning permission was to last for 25 years. Permission granted in 1999. In this context it is

considered that subject to good working practices the impacts on population and human health will not increase due to cumulative impacts.

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4.19 Mitigation Measures

The mitigation measures pertinent to population and human health have been identified and discussed elsewhere in this report in particular chapters 6 – 10. Mitigation generally follows the principles of avoid, prevent and reduce and as a last resort substitute for convenience the mitigation proposals re outlined below.

Factor	Mitigation
Soil	Topsoil will be stored for re-use Berms and side-slopes seeded with grass
Water	Existing wells monitored Oils/hydrocarbons in bunded storage Plant maintenance close to office using oil interceptor Availability of spill kits Settlement lagoon for suspended solids
Dust/Air	Minimise drop heights Avoid working in windy conditions Watering for dust suppression Minimise/reduce haul routes Plant new hedgerows Reduce vehicle speeds
Noise	All plant to comply with EC directive86/662/EEC Restricted working hours Planned maintenance of machinery
Traffic	Speed limits Watering/cleaning approach roads

4.20 Residential Impacts

The operational phase will benefit from mitigation outlined above. The residual impacts are those which remain. There will be a loss of agricultural land which is small in the context of all the agricultural land. There will be a visual impact from having additional exposed rock faces, this will be a small impact due to the low sensitivity rating in the landscape and the absence of nearby viewing points that overlook the quarry site. The site is at or near the top of an extensive plateau. There will not any residual noise impacts outside normal working hours and dust emissions will dissipate relatively quickly and will be within acceptable limits.

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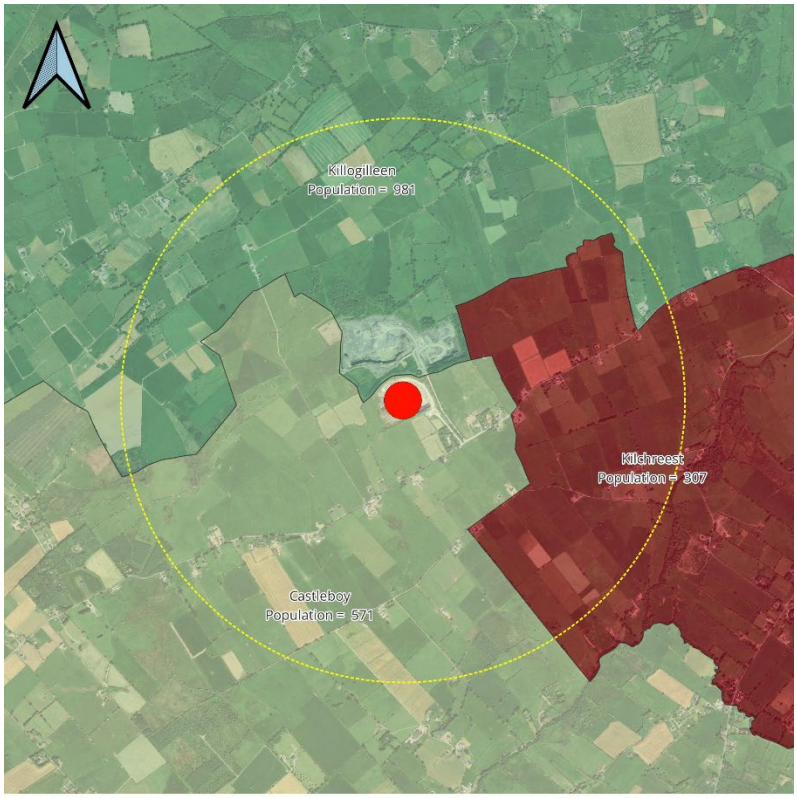
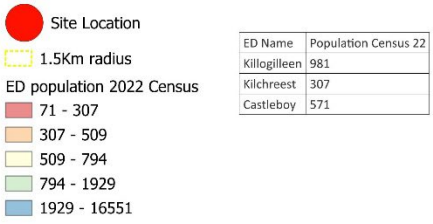
4.21 Monitoring

The monitoring in relation to population and human health will be as described in Chapters 6 – 10, and will form part of an approved environmental management system. They will be carried out at
agreed intervals records maintained and submitted to the PA.

Figure 4.1 Population





ED Name	Population Census 22
Killogilleen	981
Kilchreest	307
Castleboy	571

1:20,000

Figure 4.2 Permitted Development

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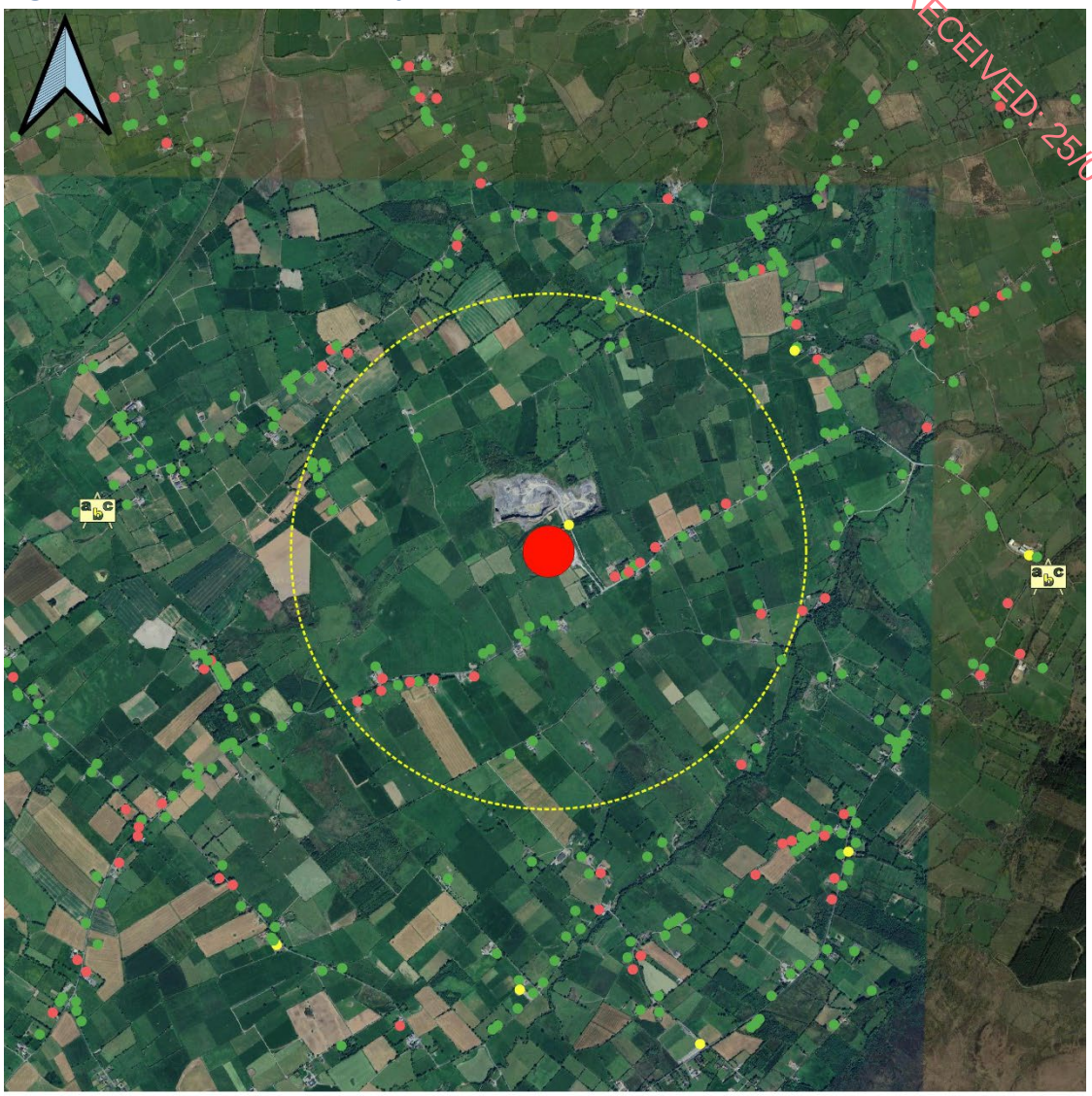

Site Location

1.5Km radius

Building uses

- Residential and Commercial Uses
- Commercial Uses
- Residential Uses

Primary schools

1:30,000

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CHAPTER 5

BIODIVERSITY

5. BIODIVERSITY – TERRESTRUAL & AQUATIC ENVIRONMENT

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5.1 Introduction

This section of the Environmental Impact Assessment Report (EIAR) outlines the biodiversity currently present in the area of the proposed development, assesses the impact of the proposal on the habitats and species identified and residual effects. This section should be read in conjunction with the site layout plans for the proposed development and project description sections of the EIAR. Mitigation measures have been proposed where required.

The ecological assessment involved a desktop review and the undertaking of field assessments of the site to identify habitats and species of flora and fauna present in order to determine the ecological diversity of this area. A Stage 1 Appropriate Assessment Report has been prepared for the proposed development and accompanies the planning application (Report Ref. PE_AA_ 10238).

This report was prepared by Paula Farrell BSc of Panther Ecology Ltd.

Appendices

The Appendices for this chapter are contained in Appendix F

The objectives of the ecological assessment were as follows:

- To undertake a comprehensive desktop review to identify European sites (Natura 2000 sites) within the vicinity of the proposed development and to determine previously recorded fauna for the area;
- Other protected sites of national importance were identified within the vicinity of the proposed development
- To undertake field assessments of the proposed development site and surroundings;
- To evaluate the biodiversity value of the proposed development and surroundings;
- To determine and assess the potential impacts of the proposed development on biodiversity;
- To propose mitigation measures for both the construction and operational phases of the development to reduce potential impacts upon biodiversity.

5.2 Legislative Framework and Planning Policy

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5.2.1 Legislative Context

Flora and fauna in Ireland are protected under National level by the Wildlife Act 1976, as amended, the European Habitats Directive (92/43/EEC) and the European Birds Directive (2009/147/EC).

Under the above legislation, sites of conservation importance are designated to legally protect flora and fauna under the following relevant categories;

- Special Areas of Conservation (SAC) are designated under the European Communities (Birds and Natural Habitats) Regulations 2011 to meet the EU Habitats Directive (92/43/EEC);
- Special Protection Areas (SPAs) are designated under the EU Birds Directive (79/409/EEC) amended in 2009 as the Directive 2009/147/EC;
- Natural Heritage Areas (NHAs) and Proposed Natural Heritage Areas (pNHA) are listed under the Wildlife (Amendment) Act 2000. A NHA is designated for its wildlife value and receives statutory protection. A list of proposed NHAs (pNHA's) was published on a non-statutory basis in 1995, but these have not since been statutorily proposed or designated.

Relevant European Legislation

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (The Habitats Directive);
- Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds (The Birds Directive);
- Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy (The Water Framework Directive);
- Directive 2006/44/EC of the European Parliament and of the Council of 6 September 2006 on the quality of fresh waters needing protection or improvement in order to support fish life (The Fish Directive (consolidated).

Relevant Irish Legislation

- The Wildlife Act 1976, as amended by the Wildlife Act 1976 (Protection of Wild Animals) Regulations, 1980, the Wildlife (Amendment) Act 2000, the Wildlife (Amendment) Act 2010, Wildlife (Amendment) Act 2012, European Communities (Wildlife Act, 1976) (Amendment) Regulations 2017 (The Wildlife Act), the Wildlife (Amendment) Act 2023;
- European Communities (Conservation of Wild Birds) Regulations 1985 (S.I. 291/1985) as amended by S.I. 31/1995;
- European Communities (Natural Habitats) Regulations, S.I. 94/1997 as amended by S.I. 233/1998 & S.I. 378/2005 (The Habitats Regulations);
- Fisheries (Consolidation) Act, 1959 (as amended), hereafter referred to as the Fisheries Act;

- European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011) as amended 2015 (S.I. 355 of 2015);
- The Flora (Protection) Order, 2022 (S.I. No. 235/2022).

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The main legislation pertaining to biodiversity and nature conservation in Ireland is outlined below.

The Wildlife Act, 1976 to the Wildlife (Amendment) Act, 2023

The Wildlife Act is the primary piece of Irish legislation providing for the protection and conservation of wildlife and provides for the control of specific activities which could adversely affect wildlife, for example the regulation of hunting and wildlife trading. Under the Wildlife Act, all bird species, 22 other fauna species and 86 flora species in Ireland are afforded protected status. The Wildlife Act, 1976 allows for the designation of specific areas of ecological value such as Statutory Nature Reserves and Refuges for Fauna. The Wildlife (Amendment) Act, 2000 provides for greater protection and conservation of wildlife and also provides for the designation and statutory protection of Natural Heritage Areas (NHA).

The Flora (Protection) Order, 2022 (S.I. 235 of 2022)

This order provides statutory protection to flora listed in Section 21 of the Wildlife Act, 1976 and Wildlife (Amendment) Act, 2000. Under the Order, it is illegal to wilfully cut, uproot or damage the listed species or interfere in any way with their habitats.

European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011)

These regulations transpose the European Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora (known as the "Habitats Directive") and the European Council Directive 2009/147/EC on the Conservation of Wild Birds (known as the "Birds Directive") into Irish Law. The regulations provide for the designation and protection of Natura 2000 sites comprising of Special Areas of Conservation (SAC) and Special Protection Areas (SPA). The regulations safeguard the SAC and SPA sites from developments with the potential to significantly impact upon them. The EC (Birds and Natural Habitats) Regulations also address invasive species, making it an offence without a licence to plant, allow to disperse, escape or spread, to reproduce or propagate, to transport, to sell or advertise invasive species specified in the regulations.

The Local Government (Water Pollution) Act, 1977, as Amended

This Act provides for the control of water pollution, by prohibiting the discharge of un-licenced polluting matter into waters.

European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (S.I. 272 of 2009)

The regulations give statutory effect to Directive 2008/105/EC and provide legal status to quality objectives for all surface waters and environmental quality standards for pollutants. The regulations allow for the classification of surface waters by the Environmental Protection Agency (EPA) in accordance with the ecological objectives approach of the Water Framework Directive. The regulations also provide for the establishment of inventories of priority substances by the EPA and the preparation of pollution reduction plans.

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Water Framework Directive (2000/60/EC)

The Water Framework Directive (WFD) aims to improve the water environment (including groundwater, rivers, lakes, estuaries and coastal waters) of E.U. Member States. The aim of the WFD is for Member States to achieve and maintain "good status" in all water bodies.

The Fisheries (Consolidation) Act, 1959, as Amended

The Act prohibits the entry of polluting substances into waters, which have the potential to adversely impact upon fish, prohibits the obstruction of passage of certain fish species and provides legal protection to the spawn/fry of eels, salmon and trout, in addition to their spawning or nursey grounds.

Fisheries (Amendment) Act, 1999

This Act outlines the responsibilities of the Regional Fisheries Board to ensure the protection and conservation of fish and their habitats within its area of jurisdiction.

European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. 293 of 1988)

These regulations give statutory effect to Directive 78/659/EEC. The regulations designate salmonid waters, specify the quality standards for designated salmonid waters and outline the monitoring requirements.

Planning and Development Regulations, 2001 to 2024

These regulations transpose the requirements of Directive 2014/52/EU (and previous Directive 2011/52/EU) on the assessment of the effects of certain projects on the environment into planning law. Under these regulations, development plans must include mandatory objectives for the conservation of natural heritage and for the conservation of European sites.

5.2.2 Planning Policies

National Policies

A number of documents have been published in relation to the Government's commitment to sustainable development, including the National Planning Framework 2040, Ireland's Second National Implementation Plan for the Sustainable Development Goals 2022-2024 and Our Sustainable Future A Framework for sustainable development in Ireland.

Regional Policies

The Regional Spatial and Economic Strategy 2020-2023 for the West region of the Northern & Western Regional Assembly, which includes the counties of Galway City and Environs, Athlone and Environs, Mayo, Sligo and Environs, Cavan-Monaghan and Donegal-Derry, outlines the long-term spatial planning strategy for the area. A number of policies relate to biodiversity and are relevant to the proposed development, as per Table 8.1 below.

Table 5.1: Regional Policies Relevant to Biodiversity and the Proposed Development

REFERENCE	POLICY
RPO 5.7	Ensure that all plans, projects and activities requiring consent arising from the RSES are subject to the relevant environmental assessment requirements including SEA, EIA and AA as appropriate.
RPO 8.18	Ensure the protection and improvement of all waters – rivers, lakes, groundwater, estuaries (transitional waters), coastal waters and their associated habitats and species throughout the region and implement measures to achieve at least Good Status in all water surface bodies.
RPO 8.20	Participate in the implementation and promote compliance with the objectives of the 'Water Framework Directive' through the River Basin Management Plans throughout the region.
RPO 9.8	To ensure the continuation and strengthening of cross-jurisdictional management of River Basin Management Plans and the implementation of the Water Framework Directive.

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Local Policies

Local planning policies are detailed in the Galway County Development Plan, 2022 – 2028 (as varied). A number of policies relate to biodiversity and are relevant to the proposed development, summarised as follows:

Table 5.2: Summary of Local Policies Relevant to Biodiversity and the Proposed Development

POLICY REFERENCE	AREA
NHB 1	Protect and where possible enhance the natural heritage sites designated under EU Legislation and National Legislation (Habitats Directive, Birds Directive, European Communities (Birds and Natural Habitats) Regulations 2011 and Wildlife Acts) and extend to any additions or alterations to sites that may occur during the lifetime of this plan. Protect and, where possible, enhance the plant and animal species and their habitats that have been identified under European legislation (Habitats and Birds Directive) and protected under national Legislation (European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011), Wildlife Acts 1976-2010 and the Flora Protection Order (SI 94 of 1999). Support the protection, conservation and enhancement of natural heritage and biodiversity, including the protection of the integrity of European sites, that form part of the Natura 2000 network, the protection of Natural Heritage Areas, proposed Natural Heritage Areas, Ramsar Sites, Nature Reserves, Wild Fowl Sanctuaries (and other designated sites including any future designations) and the promotion of the development of a green/ ecological network.
NHB 2	To implement Article 6 of the Habitats Directive and to ensure that Appropriate Assessment is carried out in relation to works, plans and projects likely to impact on European sites (SACs and SPAs), whether directly or indirectly or in combination with any other plan(s) or project(s). All assessments must be in compliance with the European Communities (Birds and Natural Habitats) Regulations 2011. All such projects and plans will also be required to comply with statutory Environmental Impact Assessment requirements where relevant.

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POLICY REFERENCE	AREA
NHB 3	No plans, programmes, or projects etc. giving rise to significant cumulative, direct, indirect or secondary impacts on European sites 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 be permitted on the basis of this Plan (either individually or in combination with other plans, programmes, etc. or projects.*
NHB 5	Support the protection and enhancement of biodiversity and ecological connectivity in non-designated sites, including woodlands, trees, hedgerows, semi-natural grasslands, rivers, streams, natural springs, wetlands, stonewalls, geological and geo-morphological systems, other landscape features and associated wildlife areas where these form part of the ecological network and/or may be considered as ecological corridors in the context of Article 10 of the Habitats Directive.
NHB 6	Support the implementation of any relevant recommendations contained in the National Heritage Plan 2030, the National Biodiversity Plan, the All-Ireland Pollinator Plan and the National Peatlands Strategy and any such plans and strategies during the lifetime of this plan.
NHB 7	Require mitigating measures in certain cases where it is evident that biodiversity is likely to be affected. These measures may, in association with other specified requirements, include establishment of wildlife areas/corridors/parks, hedgerow, tree planting, wildflower meadows/marshes and other areas. With regard to residential development, in certain cases, these measures may be carried out in conjunction with the provision of open space and/or play areas.
NHB 9	Seek to protect bats and their roosts, their feeding areas, flight paths and commuting routes. Ensure that development proposals in areas which are potentially important for bats, including areas of woodland, linear features such as hedgerows, stonewalls, watercourses and associated riparian vegetation which may provide migratory/foraging uses shall be subject to suitable assessment for potential impacts on bats. This will include an assessment of the cumulative loss of habitat or the impact on bat populations and activity in the area and may include a specific bat survey. Assessments shall be carried out by a suitably qualified professional and where development is likely to result in significant adverse effects on bat populations or activity in the area, development will be prohibited or require mitigation and/or compensatory measures, as appropriate. The impact of lighting on bats and their roosts and the lighting up of objects of cultural heritage must be adequately assessed in relation to new developments and the upgrading of existing lighting systems.
WR 1	Protect the water resources in the plan area, including rivers, streams, lakes, wetlands, springs, turloughs, surface water and groundwater quality, as well as surface waters, aquatic and wetland habitats and freshwater and water dependant species in accordance with the requirements and guidance in the EU Water Framework Directive 2000 (2000/60/EC), the European Union (Water Policy) Regulations 2003 (as amended), the River Basin District Management Plan 2018 – 2021 and other relevant EU Directives, including associated national legislation and policy guidance (including any superseding versions of same) and also have regard to the Freshwater Pearl Mussel Sub-Basin Management Plans.
WTWF 1	Ensure that proposals for development do not lead to the spread or introduction of Protect and conserve the ecological and biodiversity heritage of the wetland sites in the County. Ensure that an appropriate level of assessment is completed in relation to wetland habitats that are subject to proposals which would involve drainage or

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POLICY REFERENCE	AREA
	reclamation that might destroy, fragment or degrade any wetland in the county. This includes lakes and ponds, turloughs, watercourses, springs and swamps, marshes, fens, heath, peatlands, some woodlands as well as some coastal and marine habitats. Protect Ramsar sites under The Convention on Wetlands of International Importance (especially as Waterfowl Habitat).
P 1	Ensure that peatland areas which are designated (or proposed for designation) as NHAs, SACs or SPAs are conserved for their ecological, climate regulation, education and culture, archaeological potential including any ancient walkways (toghers) through bogs.
IS 1	It is a policy objective of the Planning Authority to support measures for the prevention and eradication of invasive species.
IS 2	Ensure that proposals for development do not lead to the spread or introduction of invasive species. If developments are proposed on sites where invasive species are currently or were previously present, an invasive species management plan will be required. A landscaping plan will be required for developments near water bodies and such plans must not include alien invasive species.
TWHS 1	Protect and seek to retain important trees, tree clusters and tree boundaries, ancient woodland, natural boundaries including stonewalls, existing hedgerows particularly species rich roadside and townland boundary hedgerows, where possible and replace with a boundary type similar to the existing boundary. Ensure that new development proposals take cognisance of significant trees/tree stands and that all planting schemes developed are suitable for the specific site and use suitable native variety of trees of Irish provenance and hedgerows of native species. Seek Tree Management Plans to ensure that trees are adequately protected during development and incorporated into the design of new developments.
IW 1	(a) Protect and conserve the quality, character and features of inland waterways by controlling developments close to navigable and non-navigable waterways in accordance with best practice guidelines. (b) Preserve, protect and enhance Galway's inland lakes and waterways for their amenity and recreational resource amenity. (c) Protect the riparian zones of watercourse systems throughout the County, recognising the benefits they provide in relation to flood risk management and their protection of the ecological integrity of watercourse systems and ensure they are considered in the land use zoning in Local Area Plans. (d) The Planning Authority will support in principle the development and upgrading of the Inland Waterways and their associated facilities in accordance with legislation, best practice and relevant management strategies, key stakeholders and bodies including Waterways Ireland. (e) Ensure all abstractions of water will be subject to assessment for compliance with the requirements of Article 6 of the Habitats Directive. (f) Seek to provide additional accesses to lake shores and rivers for public rights of way, parking and layby facilities, where appropriate. (g) Developments shall ensure that adequate soil protection measures are undertaken, where appropriate, including investigations into the nature and extent of any soil/groundwater contamination.

Galway County Development Plan 2022 – 2028 Biodiversity aim;

"*To contribute towards the protection, conservation and management of biodiversity and natural heritage including sites designated at national and EU Level and protected species and habitats outside of designated sites and to develop a green/blue infrastructure network in the interests of the proper planning and sustainable development of the county*."

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Biodiversity Plans

Following on from Ireland's third National Biodiversity Plan 2017–2021, Ireland's fourth National Biodiversity Action Plan 2023-2027 has been drafted for public consultation and "*is set against a backdrop of unprecedented challenges for nature in Ireland and globally*". It aims to build on from the successes of previous NBAP's. It sets out 6 objectives which include for a whole government approach to biodiversity, to meet conservation and restoration needs, to secure nature's contribution to people, embed biodiversity at the heart of climate action, enhance the evidence base for action on biodiversity and to strengthen Ireland's contribution to international biodiversity initiatives. The new plan also includes a set of targets and actions for each objective.

All-Ireland Pollinator Plan

In 2015, Ireland joined a number of other European countries in developing a strategy to address pollinator decline and protect pollination services. 68 governmental and non-governmental organisations agreed a shared plan, the "*All-Ireland Pollinator Plan 2015-2020*". The new version "*All-Ireland Pollinator Plan 2021-2025*" seeks to build on from the success of the previous plan and identifies 186 actions to make Ireland pollinator friendly. The plan provides a total of 37 targets for six different objectives which include, farmland, public land, private land, All-Ireland Honeybee Strategy, conserving rare pollinators and strategic coordination of the plan.

5.3 Methodology

5.3.1 Relevant Guidelines

This Biodiversity Chapter of the Environmental Impact assessment Report (EIAR) follows the Environmental Protection Agency's Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA 2022). This chapter was also written in reference to the following guidelines;

- *Draft Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment* (Department of Environment, Community and Local Government, August 2018);
- *Guidelines on Ecological Impact Assessment in the UK and Ireland,* 2nd edition (Chartered Institute of Ecology and Environmental Management CIEEM 2016);
- *Guidelines for Ecological Impact Assessment in the UK and Ireland*: Terrestrial, Freshwater and Coastal, Version 1.1 (CIEEM, 2018);

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- *Guidelines on the information to be contained in Environmental Impact Assessment Reports* (EPA, 2022);
- *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (NRA, 2009);
- *A Guide to Habitats in Ireland* (Fossitt, 2000);
- *Best Practice Guidance for Habitat Survey and Mapping* (Smith *et al.*, 2011);
- *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes* (NRA, 2009);
- *Expedition Field Techniques: Bird Surveys* (Bibby *et al.*, 2000);
- *Bird census and survey techniques* (Gregory *et al.*, 2004);
- *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn.) (Collins 2016);
- *Bat Mitigation Guidelines for Ireland* (Kelleher and Marnell, 2006);
- *Bats and artificial lighting in the UK* (Bat Conservation Trust, 2018);
- *Bats & Lighting: Guidance Notes for Planners, Engineers, Architects and Developers* (Bat Conservation Ireland, 2010).
- *Environmental Management Guidelines. Environmental Management in the Extractive Industry (EPA, 2006).*

5.3.2 Study Area / Zone of Influence

Following guidance set out by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018) and the National Roads Authority (2009), a Zone of Influence should be determined, which identifies the area in which the development could potentially impact upon ecological receptors and aquatic environments. The zone of influence takes into consideration the assigned ecological value of the receptors, which ranges from international, national, county to local, and potential pathways for impacts to occur. The zone of influence also takes into consideration the watercourses surrounding the proposed development.

Taking into consideration best practice guidance and the nature of the development, the study area for the assessment ranges from the site boundary for habitats, to buffers of 100m for specific species. However, it should be noted that these buffers were extended where required.

The biodiversity assessment addresses the potential likely significant direct, indirect and cumulative effects of the proposed development on terrestrial and aquatic biodiversity, including flora, fauna, and habitats in proximity to the site. The assessment has been carried out in three stages:

1. Desktop assessment to determine existing information and records in relation to:

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a. Sites, species, and habitats protected under Council Directive 92/43/EEC (Habitats Directive), and sites and species protected under Council Directive 2009/147/EC (Birds Directive), within the zone of influence of the proposed development and more distant hydrologically linked sites.
b. Biodiversity, habitats, and species present near the proposed development.

2. A site visit by an ecologist to establish the existing ecological conditions within the footprint of the proposed development and within the vicinity of all the proposed development elements.
3. Evaluation of the proposed development and determination of the scale and extent of potential likely direct and indirect significant effects on biodiversity (i.e., flora, fauna, and habitats) and the identification of appropriate mitigation and monitoring which may be required.

5.3.3 Desktop Research

Desktop research comprised of gathering information on designated sites within the Zone of Influence (ZoI) of the proposed development, reviewing mapping sites to provisionally identify any potential ecologically important features prior to the site assessment and reviewing online resources to determine what notable species, including protected, rare or invasive, had previously been recorded for the proposed development area and environs. The desktop review also comprised gathering information pertaining to the nearby watercourses and catchments, reviewing mapping sites and determining if notable aquatic species, including protected, rare or invasive, had previously been recorded for the watercourses in the vicinity of the proposed development. The following online resources were consulted as part of this process:

- National Parks and Wildlife Service (NPWS) website: mapping of designated sites and information on designated sites within the vicinity of the development;
- NPWS Wildlife Manuals for certain habitats and species;
- National Biodiversity Data Centre (NBDC) website: data on notable species (protected, rare or invasive) within the 10km square (M51) and 2km squares M51b and M51G in which the proposed development is located;
- NPWS reports on "*The Status of Protected EU Habitats and Species in Ireland*";
- NPWS Ireland Red Lists for species;
- Botanical Society of Britain and Ireland website: flora distribution maps;
- Data on the status of bird species from "*Birds of Conservation Concern in Ireland 2021-2026*", (Gilbert, Stanbury and Lewis, 2021);
- Various mapping websites, including EPA Envision, Google Maps, Myplan and OSI;
- Protected Mammals Survey by Wildlife Surveys Ireland.

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Water quality data from the EPA was reviewed for the assessment of biological and environmental data collected on waterbodies in Ireland (Assessed November 2024). The assessment of the aquatic environment took into consideration:

- To undertake a comprehensive desktop review of the aquatic habitats and species within the vicinity of the proposed development;
- To undertake a field assessment of the proposed development site and surroundings in the context of aquatic ecology;
- To determine and assess the potential impacts of the proposed development on aquatic habitats, flora and fauna;
- To propose mitigation measures for the operational and/or construction phases of the development to reduce potential impacts upon aquatic flora and fauna.

5.3.4 Field Surveys Methodology

Site assessments were undertaken on the 12th and 19th of September 2024 to examine the ecological context of the proposed development, as outlined in Table 5.3 below. The survey had due consideration for the relevant best practice guidelines as referenced in Section 5.3.

Table 5.3: Ecological Surveys Informing the EIAR

SURVEY	STUDY AREA	SURVEY DATES
Habitat Survey	Boundary to 300m outside	12th and 19th of September 2024
Fauna Survey	Boundary to 300m outside	12th and 19th of September 2024
Preliminary Day Time Bat Roost Assessment	Boundary to 300m outside	12th and 19th of September 2024
Mammal Survey 1	Trail Camera and 50m	7th to 13th November 2024
Mammal Survey 2	Trail Camera and 50m	13th to 19th November 2024

Habitats and Flora Survey

These assessments involved determining the habitats and flora present within the proposed development. The habitat survey was undertaken in accordance with the standard methodology outlined in Fossitt's "*A Guide to Habitats in Ireland*", (Fossitt, 2000), a hierarchical classification scheme based upon the characteristics of vegetation present. The Fossitt system also indicates when there are potential links with Annex I habitats of the E.U. Habitats Directive (92/43/EEC). Cognisance was also taken of the Heritage Council guidelines, "*Best Practice Guidance for Habitat Survey and Mapping*", (Smith *et al.,* 2011). The relative abundances of flora was determined using the DAFOR Scale, an acronym for the abundance levels – Dominant, Abundant, Frequent, Occasional and Rare.

During site walkovers, any notable flora species were recorded, with an emphasis on statutorily protected or rare species, species of conservation significance and invasive species.

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Fauna Survey

Fauna surveys were undertaken during bright and dry weather conditions. Direct observation methods were used for the survey of fauna, however, these methods may not be suitable for shy and nocturnal species. Therefore, indirect methods were also employed, focusing on evidence of fauna including tracks, burrows/setts/nests, droppings, food items and hair. The habitats on site were assessed for signs of usage by fauna, and the potential to support protected or red-listed species.

In addition, a trail camera was deployed to capture usage of particular habitats onsite by mammals. This is detailed further within section 5.5.2.

Bat Survey

Areas within the proposed development site with the potential to support bat roosts and / or foraging / commuting routes, and which have the potential to be impacted upon by the proposed development were the main focus of the surveys outlined below.

Assessment of Bat Roost Potential

A daytime assessment of individual trees and hedgerows within the proposed development site potentially affected by the proposed development was undertaken on the 12th and 19th of September 2024.

The assessment comprised of an external inspection of trees and buildings to identify potential roost features (PRFs) and evidence of bat activity, using close focusing binoculars. The criteria used to categorise the PRFs or suitability of trees and buildings as a potential roost are summarised in the table below, based upon the guidelines by Collins (2016) and Hundt (2012).

Table 5.4: Bat Roost Potential Categories

CATEGORY	DESCRIPTION
High Trees / buildings that are suitable for use by large numbers of bats on a regular basis	Features include holes, cracks or crevices that extend or appear to extend back to cavities suitable for bats. In buildings, examples include eaves, barge boards, gable ends and corners of adjoining beams, ridge and hanging tiles, behind roofing felt or within cavity walls. In trees, examples include hollows and cavities, rot holes, cracks/splits and flaking or raised bark which could provide roosting opportunities. Any ivy cover is sufficiently well-established and matted so as to create potential crevices beneath.

CATEGORY	DESCRIPTION
	Further survey work would be required to determine whether or not bats are present, and if so, the species present. Appropriate mitigation and potential licencing requirements may then be determined.
Moderate Moderate potential is assigned to trees / structures with potential to support bat roosts but supports fewer features than a high potential building / tree and is unlikely to support a roost of high conservation value.	From the ground, building / tree appears to have features (e.g. holes, cavities, cracks or dense ivy cover) that may extend back into a cavity. However, owing to the characteristics of the feature, they are deemed to be sub-optimal for roosting bats. **Further survey work would be required to determine whether or not bats are present, and if so, the species present. Appropriate mitigation and potential licencing requirements may then be determined.**
Low Low potential is assigned to structures and trees with features that could support individual bats opportunistically.	If no features are visible, but owing to the size, age and/or structure, hidden features, sub-optimal for roosting bats, may occur that only an elevated inspection may reveal. In respect of ivy cover, this is not dense (i.e. providing PRF in itself) but may mask presence of PRF features. **Further survey work may be required for buildings only or works may proceed using reasonable precautions (e.g. controlled working methods, under license or supervision of a bat worker).**

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Bird Survey

General bird usage of the development site was assessed on the 12th and 19th of September 2024. While walking the development site, stops were undertaken on a regular basis during which time the area was scanned as far as the terrain or weather conditions allowed. Birds were identified by visual sightings and auditory identification of songs and calls. Birds flying overhead were also included as part of the survey.

Surveys Scoped Out

The following ecological features were scoped out:

Invertebrate (aquatic) / Fish surveys: There are no watercourses or drainage ditches within the red line boundary of the site. The nearest mapped watercourse is located approximately 1.1km to the south-west of the site. The proposed development would not support fish. There are a number of artificial ponds onsite created as a result of rainwater run-off. The artificial ponds do not contain any aquatic species of note but would be suitable habitat for macroinvertebrates and amphibians such as Common Frog (*Rana temporaria*). No construction/operational works will take place within or adjacent an aquatic habitat of

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significance. There will be a permanent loss of the existing artificial ponds onsite however, this is a modified habitat of lower significance. It is considered that the assessment of the potential impacts of the development upon water quality (discussed further in this section) would be sufficient in assessing the potential impact of the development upon aquatic habitats and species.

Reptile surveys: Areas of the study area may provide suitable basking and refuge habitat for protected viviparous lizard (*Zootoca vivipara).* The numbers of viviparous lizard, if present at the site, are likely to be low and unlikely to be picked up in survey.

Survey Limitations

Every effort has been made to provide an accurate assessment of the situation pertaining to the site. However, an ecological survey can only assess a site at a particular time and is limited by various factors such as the season, timing of the survey, climatic conditions and species behaviour. Ecological surveys are therefore snapshots in time and should not be regarded as a complete study. Direct observations or evidence of protected species is not always recorded during ecological surveys. However, this does not indicate that the species is absent from the site.

To ensure any limitations encountered did not significantly impact upon the findings of the ecological assessments, the ecological surveys undertaken also assessed the potential of the habitats to support protected species, and cognisance has been taken of available online baseline data (e.g. flora and fauna records from the NBDC, consultation with NPWS regarding protected / threatened species, previous surveys undertaken by Wildlife Surveys and a precautionary approach taken.

It should be noted that most areas of the proposed development were accessible however, some areas of dense scrub to the north were not fully accessible. The walkover survey included looking for signs (burrows, fresh spoil, scat, footprints, tracks) of protected species. Trail cameras were deployed to capture any potential protected species using the scrub areas or accessing the lands.

5.3.5 Ecological Valuation Criteria

The ecological value of the habitats and species identified at the development site have been assessed following the criteria outlined in the 2009 NRA guidelines and is consistent with the *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal* (CIEEM, 2018).

5.4 Consultation

Consultation was sought with the following statutory bodies and competent authorities with regards biodiversity:

- National Parks and Wildlife Service (NPWS);

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5.5 Description of Existing Environment

The proposed development is located partly within the grounds of an existing quarry and agricultural grassland. Scrub and hedgerows delineate the site boundaries.

The proposed development will require the removal of some existing structures and for the removal of areas of scrub, grassland, hedgerows and one mature tree.

The land use of the area surrounding the proposed development is mainly rural and primarily used for agricultural activities. The Roadstone Quarry which closed in July 2024 is located to the north of the development site. A number of residential one-off houses are located along the local road network within the vicinity. The closest mapped occupied house is located approximately 74m to the east of the red line boundary.

5.5.1 Designated Sites

The proposed development does not directly impinge on any designated site. In total, there are six designated sites Natura 2000 sites located within the Zone of Influence (ZoI) of the proposed development: Thirteen Special Area of Conservation (SAC) sites and five Special Protection Area (SPA), site.

There are also nine proposed Natural Heritage Area (pNHA) sites and one Natural Heritage Area (NHA) site within the Zone of Influence of the development site.

There is one RAMSAR site within the Zone of Influence (ZoI) (12km SW) of the development site: Coole Lough & Garryland Wood (20). This site is also listed as a Nature Reserve.

Maps detailing these designated sites in relation to the proposed development are included in Attachment 1.

The following tables detail the SAC, SPA and pNHA sites located within the Zone of Influence (ZoI) of the proposed development.

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Table 5.5: SAC/SPA Sites within the Zone of Influence (ZoI) of the Proposed Development

SITE NAME	SITE CODE	APPROX. DISTANCE TO DEVELOPMENT	QUALIFYING INTERESTS
Slieve Aughty Mountains SPA	004168	2.2km SE	[A082] Hen Harrier (*Circus cyaneus*) [A098] Merlin (*Falco columbarius*)
Peterswell Turlough SAC	000318	2.7km SW	[3180] Turloughs [3270] Rivers with muddy banks with Chenopodion rubric p.p. and Bidenton p.p. vegetation
Sonnagh Bog SAC	001913	4.7km SE	[7130] Blanket bogs (*if active bog)
Castletaylor Complex SAC	000242	5.6km NW	[3180] Turloughs [4060] Alpine and Boreal heaths [5130] Juniperus communis formations on heaths or calcareous grasslands [6210] Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuca-Brometalia*) (*important orchid sites) [8240] Limestone pavements
Lough Coy SAC	002117	5.9km SW	[3180] Turloughs
Carrowbaun, Newhall and Ballylee Turloughs SAC	002293	6.4km SW	[3180] Turloughs
Ardrahan Grassland SAC	002244	6.1km NW	[4060] Alpine and Boreal heaths [5130] Juniperus communis formations on heaths or calcareous grasslands [6210] Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuca-Brometalia*) (*important orchid sites) [8240] Limestone pavements
Rahasane Turlough SAC	000322	7km NW	[3180] Turloughs
Rahasane Turlough SPA	004089	7km NW	[A038] Whooper Swan (*Cygnus cygnus*) [A050] Wigeon (*Anas penelope)*

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SITE NAME	SITE CODE	APPROX. DISTANCE TO DEVELOPMENT	QUALIFYING INTERESTS
			[A140] Golden Plover (*Pluvialis apricaria*) [A156] Black-tailed Godwit (*Limosa limosa*) [A394] Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A999] Wetland and waterbirds
Ballinduff Turlough SAC	002295	7km SW	[3180] Turloughs
Lough Rea SAC	000304	8km NE	[3140] Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.
Lough Rea SPA	004134	8km NE	[A056] Shoveler (*Anas clypeata*) [A125] Coot (*Fulica atra*) [A999] Wetland and waterbirds
Kiltiernan Turlough SAC	001285	8.3km NW	[3180] Turloughs
Lough Fingall Complex SAC	000606	8.6km NW	[3180] Turloughs [4060] Alpine and Boreal heaths [5130] Juniperus communis formations on heaths or calcareous grasslands [6210] Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuca-Brometalia*) (*important orchid sites) [7210] Calcareous fens with Cladium mariscus and species of the Caricion davallianae [8240] Limestone pavements [1303] *Rhinolopphus hipposideros* (Lesser Horseshow Bat)
Coole-Garryland Complex SAC	000252	9.1km SW	[3150] Natural eutrophic lakes with Magnopotamion or Hydrocharition – type vegetation [3180] Turloughs [3270] Rivers with muddy banks with Chenopodion rubric p.p. and Bidenton p.p. vegetation [5130] Juniperus communis formations on heaths or calcareous grasslands

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SITE NAME	SITE CODE	APPROX. DISTANCE TO DEVELOPMENT	QUALIFYING INTERESTS
			[6210] Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuca-Brometalia*) (*important orchid sites) [8240] Limestone pavements [1303] *Rhinolopphus hipposideros* (Lesser Horseshow Bat)
Coole-Garryland SPA	004107	9.6km SW	[A038] Whooper Swan (*Cygnus cygnus*)
Galway Bay Complex SAC	000268	14.5km W	[1140] Mudflats and sandflats not covered by seawater at low tide [1150] Coastal lagoons [1160] Large shallow inlets and bays [1170] Reefs [1220] Perennial vegetation of stony banks [1230] Vegetated sea cliffs of the Atlantic and Baltic coasts [1310] Salicornia and other annuals colonising mud and sand [1330] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1410] Mediterranean salt meadows (*Juncetalia maritimi*) [3180] Turloughs [5130] Juniperus communis formations on heaths or calcareous grasslands [6210] Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuca-Brometalia*) (*important orchid sites) [7210] Calcareous fens with Cladium mariscus and species of the Caricion davallianae [7230] Alkaline fens [8240] Limestone pavements [1355] L*utra lutra* (Otter) [1365] *Phoca vitulina* (Harbour Seal)
Inner Galway Bay SPA	004031	14.5km W	[A002] Black-throated Diver (*Gavia arctica*) [A003] Great Northern Diver (*Gavia immer*) [A017] Cormorant (*Phalacrocorax carbo*)

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SITE NAME	SITE CODE	APPROX. DISTANCE TO DEVELOPMENT	QUALIFYING INTERESTS
			[A028] Grey Heron (*Ardea cinerea*) [A046] Light-bellied Brent Goose (*Branta bernicla hrota*) [A050] Wigeon (*Anas penelope*) [A052] Teal (*Anas crecca*) [A069] Red-breasted Merganser (*Mergus serrator*) [A137] Ringed Plover (*Charadrius hiaticula*) [A140] Golden Plover (*Pluvialis apricaria*) [A142] Lapwing (*Vanellus vanellus*) [A149] Dunlin (*Calidris alpina*) [A157] Bar-tailed Godwit (*Limosa lapponica*) [A160] Curlew (*Numenius arquata*) [A162] Redshank (*Tringa totanus*) [A169] Turnstone (*Arenaria interpres*) [A179] Black-headed Gull (*Chroicocephalus ridibundus*) [A182] Common Gull (*Larus canus*) [A191] Sandwich Tern (*Sterna sandvicensis*) [A193] Common Tern (*Sterna hirundo*) [A999] Wetland and Waterbirds

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Table 5.6: pNHA Sites within the Zone of Influence (ZoI) of the Proposed Development

SITE NAME	SITE CODE	DISTANCE TO PROPOSED DEVELOPMENT
Peterswell Turlough pNHA	0000318	2.7km SW
Sonnagh Bog pNHA	001913	4.7km SE
Castletaylor Complex pNHA	000242	5.7km NW
Rahasane Turlough pNHA	000322	6.5km NW
Lough Rea pNHA	000304	8km NE
Kiltiernan Turlough pNHA	001285	8.4km NW
Lough Fingall Complex pNHA	000606	8.7km NW
Coole-Garryland Complex pNHA	000252	9km SW
Galway Bay Complex pNHA	000268	13km NW
Slieve Aughty Bog NHA	001229	13km SE

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The following designated sites are located a significant distance from the development site and lack any direct surface water hydrological connectivity; Sonnagh Bog SAC, Sonnagh Bog pNHA, The Castletaylor Complex SAC and pNHA, Lough Coy SAC, the Carrowbaun, Newhall and Ballylee Turloughs SAC, Ardrahan Grassland SAC, Ballinduff Turlough SAC, Lough Rea SAC/SPA and Lough Rea pNHA, Kiltiernan Turlough SAC and pNHA, Lough Fingall Complex SAC and pNHA, Galway Bay Complex SAC and pNHA.

OSI Maps accessed online also reveal a number of karst features within the area. Therefore, there is potential for a groundwater connection. However, there will be no construction or excavation works within or near these karst features. The main risk to groundwater is from hydrocarbon spillage and chemicals. Re-fuelling will not be undertaken within the excavated areas but rather on the surface over a concrete fuel slab. Any surface water run-off from the fuel slab will pass through a petrol interceptor prior to being directed to a new soak pit. Standard water quality measures will be implemented during the operational phase to prevent any potential impact to groundwater. All fuels and chemicals will be bunded above ground. These are detailed in section 5.8. Therefore, the risk to the development having any significant effects on the aforementioned sites due to a deterioration in groundwater is unlikely and given their significant distances from the development site.

In relation to species listed within the designated sites above, the proposed development is considered to be a significant distance and lacks suitable supporting habitats.

According to the water chapter (Chapter 7), "*There are no surface drains present within or adjacent to the site with all rainwater eventually infiltrating through the shallow limestone till into the limestone bedrock and groundwater aquifer. The quarry site is located right at the watershed divide and potentially the infiltrating waters could discharge either to the Kilchreest River system (Lough Coy Turlough near Ballylee) to the southwest (part of the Lough Coole Turlough catchment) or migrate northwest via groundwater to the Kilcolgan_040 River (Rahasane Turlough)* ."

Therefore, the sites to be included within this assessment are the Slieve Aughty Mountains SPA (Site Code: 004168), the Peterswell Turlough SAC (Site Code: 000318), the Rahasane Turlough SPA (Site Code: 004089), the Rahasane Turlough SAC/pNHA (Site Code: 000322) and the Coole-Garryland SPA (Site Code: 004107) (see Attachment 1).

Site synopsis for each Natura 2000 site is found at www.npws.ie.

5.5.2 Flora and Fauna

5.5.2.1 Flora & Habitats Onsite

During the site assessment the following habitats were observed. A full list of species for each habitat is provided in attachment 3.

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Improved agricultural grassland (GA1) dominates to the west and south of the proposed development. It is managed for agriculture as is evident of the short grass swards. The species composition is comprised of common flora found throughout Ireland.

Active quarries and mines (ED4) consists of the existing active quarry to the east of the site. No plants were recorded however, **scrub (WS1)** is found along the boundaries to this habitat. An area to the west of the existing quarry has been stripped of topsoil with significant disturbance from machinery. It includes areas of loose gravel, some exposed limestone where flora have begun to colonise. It has been classified as **active quarries and mines (ED4)** with some areas of **buildings and artificial surfaces (BL3)** comprised of gravel. This habitat merges with other habitats as described above and below. The plant cover is low within the heavily disturbed area. Goat Willow (*Salix caprea*) was recorded as invading.

Scrub (WS1) dominates to the north-east of the site within the area of the red line boundary that was topped. It also defines some of the existing field boundaries over the old stone wall habitats. The dominating species is Bramble (*Rubus fruticosus*) with Blackthorn (*Prunus spinosa*), Willow (*Salix* spp.) and Chinese Bramble (*Rubus tricolor*). Hawthorn (*Crataegus monogyna*) occurs infrequently also.

Hedgerows (WL1) border the improved agricultural grasslands both within and outside the red line boundary. Species are mostly native. These hedgerows are maintained as part of management of the agricultural lands.

Areas of **dry meadows and grassy verges (GS2)** are found adjacent the existing entrance and to the north. This is a semi-natural habitat. The vegetation consists of taller sward heights that have been unmanaged. This habitat has links to the Lowland Hay Meadows (*Alcopecurus pratensis, Sanquisorba officinalis*) [6510] however, it is absent of the characteristic high quality and positive indicator species.

A small area classified as **recolonising bare ground (ED3)** occurs west of the existing road. This is a very small area of little significance.

Other artificial lakes and ponds (FL8) occur in some areas of the topped land where depressions have allowed for surface water to accumulate. Areas and depths varied. Some artificial ponds contained few aquatic vegetation whilst others did not.

Habitats of note outside the red line boundary

Some of the habitats mentioned above occur both within and outside the red line boundary. This includes **improved agricultural grassland (GA1)**, **hedgerows (WL1), scrub (WS1**) and **Active quarries and mines (ED4).** The plant species composition is similar to that as described above. **Buildings and artificial surfaces (BL3)** comprises the existing road, gravelled carpark and buildings.

Additional habitats found outside the red line boundary include what appears to be a woodland however, it is in actual fact classified as **Scattered trees and parkland (WD5)** to the south-east of the development. It is an area of planted Apple (*Malus* spp.) trees that have been left unmanaged for some time. In addition to the Apple trees, Elder (*Sambucus* spp.), young Ash (*Fraxinus excelsior*), Hawthorn (*Crataegus monogyna*), Nettle (*Urtica dioica*) and

Ivy (*Hedera* spp.) were recorded. **Treelines (WL2)** occur around this habitat in what was potentially an old garden and orchard. The treelines are comprised of Ash (*Fraxinus excelsior*), Sweet Chestnut (*Castanea sativa*), Sycamore (*Acer pseudoplatanus*) and Cypress (*Cupressus* spp.). To the south-west is an area of **dry meadows and grassy verges (GS2)** and **Scrub (WS1).** No additional species were recorded in these areas. Two **treelines (WL2)** occur side by side within this area. They are comprised of Scots Pine (*Pinus sylvestris*) and Spruce (*Picea* spp.). Ash (*Fraxinus excelsior*) and Sycamore (*Acer pseudoplatanus*) occur in a scattered fashion also.

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Habitats & Flora Summary

No Third Schedule invasive flora were noted during the site assessment. Unscheduled invasive species recorded onsite include Wall Cotoneaster (*Cotoneaster horizontalis*) and Sycamore (*Acer pseudoplatanus*) within the red line boundary of the site. These are unscheduled species but considered medium impact.

The proposed development does not contain the habitats for which the Peterswell Turlough SAC or the Rahasane Turlough SAC have been designated for. The artificial ponds onsite are a result of rainwater.

No protected flora species were recorded onsite. Unconfirmed *Baldellia ranunculoides* was recorded onsite however, the classification was based on vegetative characteristics. According to the Irish Red List for Vascular Plants, the species *Baldellia ranunculoides* is considered of Least Concern in Ireland but Near Threatened in Europe and Globally. There are two sub species of this plant, *Baldellia ranunculoides* subsp. *ranunculoides* (Least Concern in Ireland) and *Baldellia ranunculoides* subsp. *repens* (Waiting List in Ireland). According to the National Biodiversity Data Centre maps and BSBI Plant Atlas Maps, there are no records for this Genus onsite however, there are a number of records for this species in the west of Ireland. It is considered a widespread species, particularly to the west of Ireland. Given that this species is of least concern in Ireland, confirmation of this species onsite is not required. In addition, it is not listed a protected species.

The majority of the proposed development site, being active quarries and mines, recolonising bare ground, improved agricultural grassland, and buildings and artificial surfaces can be considered modified and of low ecological value. The remainder of the site, comprising of treelines, hedgerows, dry meadows and grassy verges and scrub, can be considered to be of moderate to higher ecological value. The other artificial lakes and ponds would be of lower to moderate ecological value given their size, absence of connectivity to other freshwater habitats, limited prey availability and given they are a modified habitat as a result of rainwater. However, they could potentially support breeding amphibians.

All habitats outside the red line boundary but within the landholding will be retained including areas of scrub, treelines and scattered trees and parkland.

The ten habitats identified as per the Fossitt habitat classification scheme for the proposed development are summarised in Table 5.7 and are shown on a habitat map included as Figure 5.6. See Attachment 3 for Full List of Recorded Flora and Attachment 2 for Photo Log.

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Table 5.7: Summary of Habitats Identified at the Proposed Development Site

HABITAT CLASSIFICATION HIERARCHY		
LEVEL 1	**LEVEL 2**	**LEVEL 3**
B – Cultivated and built land	**BL** – Built Land	**BL3** – Buildings and artificial surfaces
		BL1 – Stonewalls and other stonework
G – Grassland and marsh	**GA** – Improved grassland	**GA1** – Improved agricultural grassland
	GS – Semi-natural grassland	**GS2 -** Dry meadows and grassy verges
W – Woodland and scrub	**WL** – Linear woodland/scrub	**WL2 –** Treeline
		WL1 - Hedgerows
	WD – Highly modified/non-native woodland	**WD5 –** Scattered trees and parkland
	WS – Scrub/transitional woodland	**WS1 -** Scrub
E – Exposed rock and disturbed ground	**ED –** Disturbed ground	**ED3 –** Recolonising bare ground
		ED4 – Active quarries and mines
F - Freshwater	**FL –** Lakes and ponds	**FL8 –** Other artificial lakes and ponds

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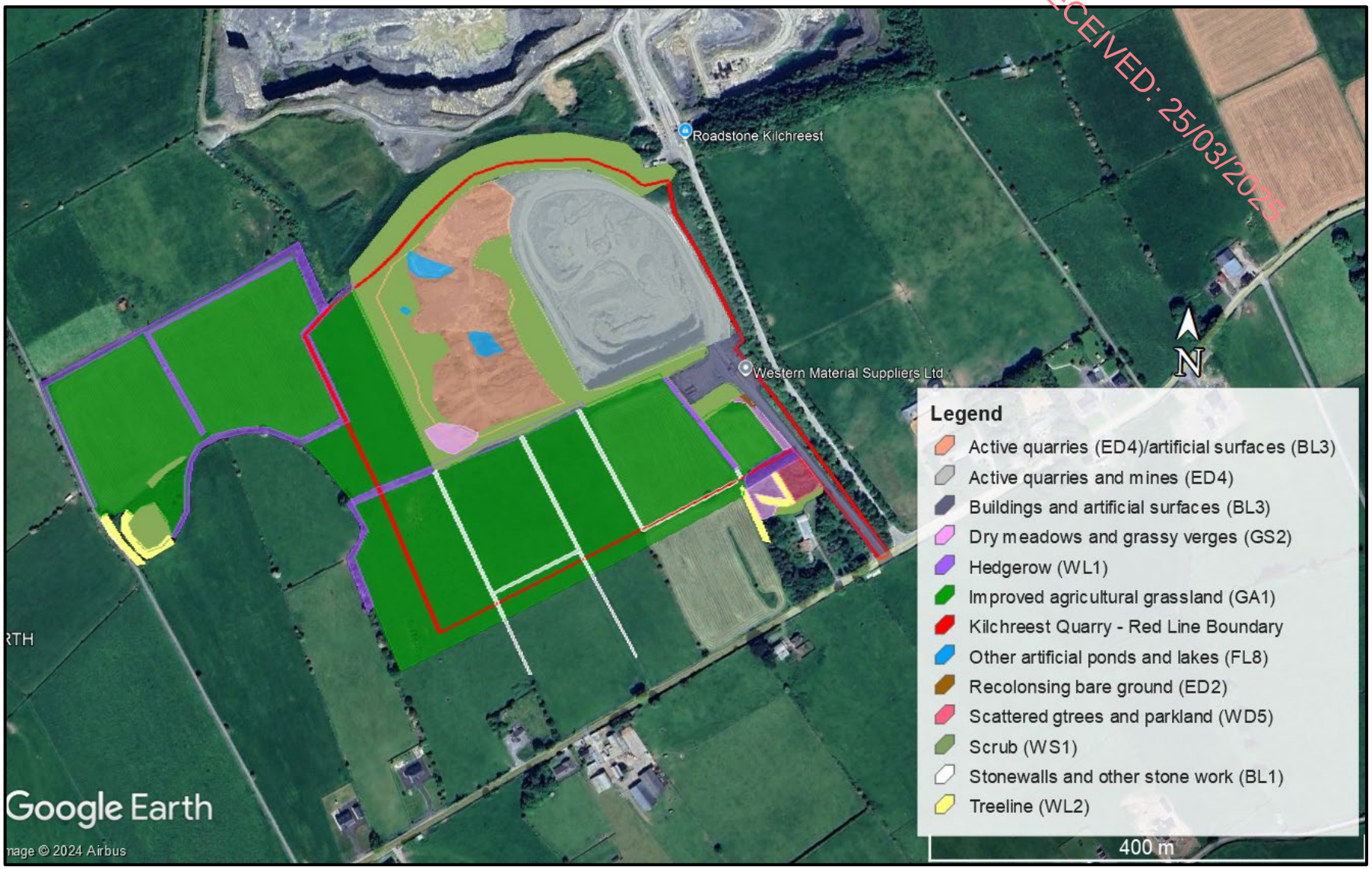

Figure 5.6: Habitat Map of Encountered Habitats at the Proposed Development Sit

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5.5.2.2 Fauna

Mammals – Field Surveys

During the site walkover mammal paths (Figure 5.7 i) were observed within the grassland habitats onsite with evidence of Fox scat (*Vulpes vulpes*) recorded (Figure 5.7 iii). A well-worn mammal path (Figure 5.7 v) was observed within dry meadows and grassy verges habitat to the north from the improved agricultural grassland to the west and within scrub to the east. The track appears to lead into the agricultural grasslands to the south-east. There was no evidence of Otter or Badger, including setts or latrines at the proposed development site. No burrows were identified within the red line boundary or areas in which the proposed extension refers to. Evidence of mammal movement was also observed through the scrub habitat on the western bund of the area cleared of topsoil (Figure 5.7 ii).

A mammal burrow (Figure 5.7 iv) and tracks were identified within a narrow strip of woodland to the south-east of the site, outside the red line boundary between agricultural grassland and an agricultural yard. There was no evidence of recent usage, scat or foliage. It had only one entrance/exit and there were no additional burrows found. The approximate height was 1ft h x 1 ft w. It does not align with that of a typical Badger sett. This burrow is likely that of a Fox given the evidence of Fox onsite. No other mammals, or evidence of mammals, were noted within the development site during the walkover site surveys.

Figure 5.7 (i)

Figure 5.7 (ii)

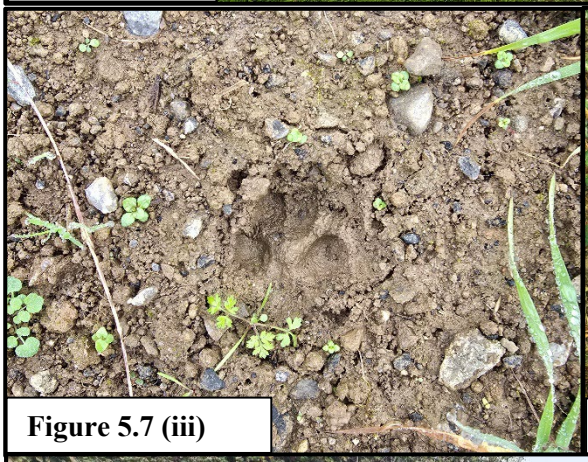

Figure 5.7 (iii)

Figure 5.7 (iv)

Figure 5.7 (v)

Figure 5.7: Evidence of mammal usage throughout the site. (i) Mammal path in agricultural grassland (S), (ii) Animal movement through scrub bund to centre-west (iii) Evidence of Fox within the red line boundary (iv) mammal burrow to south-east outside red line boundary. No works will be undertaken in this area. (v) Mammal path onsite within dry meadows and grassy verges habitat.

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Mammal Surveys - Trail Camera

Limitations of the site survey includes some areas of dense scrub along the northern boundary adjacent the existing active quarry. Two bunds, one on the Kilchreest side and another on the Roadstone Quarry site were inaccessible. In addition, mammal tracks were previously observed within the bund to the west. Given that the bunds on the Kilchreest side are proposed to be removed, further surveys using a trail camera were undertaken to ascertain if any protected species were using the scrub. A trail camera was set up on the 7th November within the first location facing the scrub to be removed.

Table 5.8: Mammal trail camera

WEEK	DATE	LOCATION	RESULTS
1	7th – 13th November 2024	53.167175, -8.720712	No mammals or fauna captured
2	13th – 19th November 2024	53.165967, -8.719618	Badger recorded

Week 1

The trail camera was set up on the 7th to the 13th November 2024 (Week 1) and positioned along a mammal track facing the scrub habitat to the north-west of the site. No mammals were recorded within this time period.

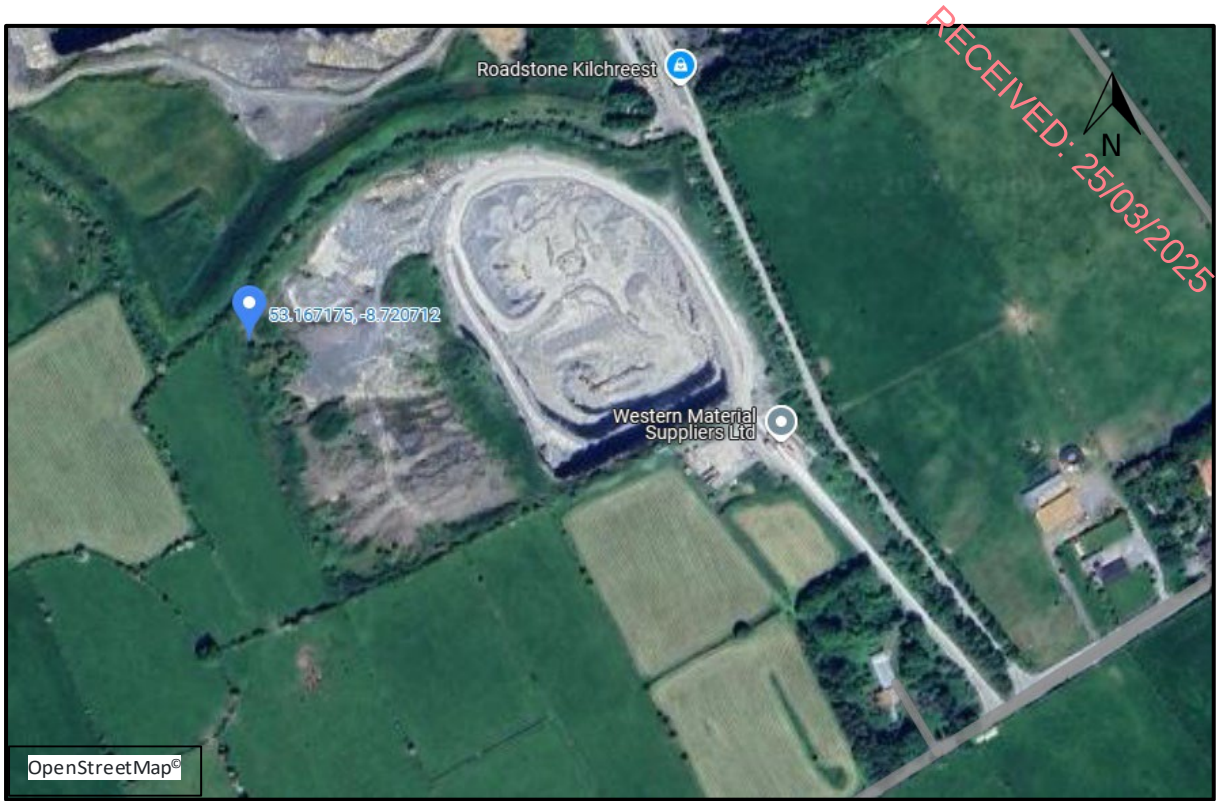

Figure 5.8 (i): Location of mammal trail camera facing scrub to north-west during week 1

Figure 5.8 (ii): Location of trail camera in week 1

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Week 2

The trail camera was moved on the 13th November and positioned along the well-worn mammal track noted above.

Figure 5.9 (iii): Location of trail camera along a worn mammal track within dry meadows and grassy verges habitat facing east during week 2

Results

No mammals were recorded during the first week of the trail camera being set up. There was no new evidence of any mammal usage within the scrub other than the existing mammal pathways. There was no evidence of any fresh soil or burrows, although as previously described, this area of scrub was mostly impenetrable. Given the thick scrub, and substrates comprised mostly of stone, it is unlikely that Badger or other mammals would utilise this area other than for foraging.

On the 13th November 2024 during the second week, a Badger was recorded entering the site from the western agricultural grassland and along the mammal track (Figure 5.7 (v). The badger was recorded entering the topped area from the improved agricultural grassland to the west of the site. The badger travelled in a west to east direction. As noted previously, a secondary mammal track was observed to the east which leads into the grassland south of the existing active quarry. Other than mammal tracks and scat, there was no additional

evidence of burrows or setts along this southern bund. It would appear that Badger forages within the site at night. Badger territory ranges from 15 hectares to 300 hectares.

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Figure 5.9 (iv): Badger recorded on trail cameras onsite

Conclusion

While the dense scrub can inhibit view of potential mammal burrows and/or badger setts, there was no evidence to suggest that any setts or burrows were located within the scrub. No areas of fresh soil or worn tracks were observed that could potentially lead to a sett.

As Badger have been captured within the trail camera foraging at night, the precautionary principle will be applied. An ecologist will be onsite during the removal of the scrub bunds. A mammal survey will be conducted prior to removal on the day and continued observations for potential mammal burrows/setts will be conducted throughout the scrub removal process. This is detailed further below in section 5.8.

Mammals (excluding bats) – Desktop records

The proposed development is located within the 10km tetrad M51. Protected fauna species of note recorded within the NBDC 10km square (Tetrad –M51) include the protected species: Badger (*Meles meles*), Pygmy Shrew (*Sorex minutus*), Red Squirrel (*Sciurus vulgaris*), Otter *(Lutra lutra*), Pine Marten (*Martes martes*), and Hedgehog (*Erinaceus europaeus*).

<u>Badger</u>

The most recent record for Badger is in 2005 within the development site as part of the Badger Setts of Ireland Database. There are records of Badger within the wider landscape also. The proposed development could offer suitable foraging habitats, although no evidence of Badger setts etc were recorded. However, it should be noted, the majority of the areas of scrub are on bunds comprised mostly of large stone substrates as opposed to topsoil.

<u>Pine Marten</u>

There are no online records for Pine Marten within or adjacent the redline boundary. Pine Marten are found mainly within woodlands, both deciduous and coniferous. There are no woodlands onsite within the red line boundary.

<u>Reptiles</u>

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The Viviparous Lizard (*Zootoca vivipara*) is Ireland's only native reptile. It is typically found on peatlands, coastal areas, grasslands or any area suitable for basking in the sun. Areas of the proposed development site may provide suitable basking and refuge habitat for Viviparous Lizard (*Zootoca vivipara*). This species was not recorded during the site assessment. There are also no records of this species onsite.

Invertebrates

With regards terrestrial invertebrates, Buff-tailed Bumblebee (*Bombus terrestris*), Common Carder Bee (*Bombus pascuorum*), Speckled Wood (*Parage aegeria*), Small Tortoiseshell (*Aglais urticae*), Hoverflies (*Syrphidae*) and Spiders (Arachnida) were recorded. No Marsh Fritillary (*Euphydryas aurinia*) or its larval foodplant Devil's-bit Scabious was recorded within or adjacent the red line boundary of the site. The development site would not support this species. It was considered that the study area does not contain suitable habitat for protected whorl snail species (*Vertigo* spp.). Invertebrates recorded within the 10km tetrad M51 includes Marsh Fritillary (*Euphydryas aurinia*).

In relation to aquatic invertebrates, Dragonflies (*Anisoptera*) and Pond skaters (*Gerridae*) were observed on and near the artificial ponds. No fish were observed within these ponds, nor would these ponds offer suitable habitat for fish as the ponds were shallow, small and lacks any connection to nearby watercourses or streams.

No invertebrates of note were recorded within the 2km tetrads M51B or M51G.

There are no watercourses or drainage ditches within or adjacent the red line boundary.

Freshwater Fauna

As there are no watercourses or drainage ditches located within the boundary of the site and no proposed works including drainage within a watercourse, there is no direct hydrological connection to any watercourse potentially containing protected freshwater species. In terms of groundwater, flow within karst regions can be unpredictable however they typically follow land contours. Given that there will be no-refuelling within the proposed extension area, the risk of impacts to groundwater is considered low.

White-clawed Crayfish

The proposed development is located within the current known distribution and favourable reference of this qualifying interest (NPWS, 2019c). The most recent NBDC record (2019) for Crayfish is located approximately 1.6km to the south-east of the site along the Kilchreest watercourse. Crayfish are not listed as a qualifying interest of the Peterswell Turlough SAC/pNHA and SPA, the Slieve Aughty Mountains SPA, the Rahasane Turlough SAC/SPA/pNHA or the Coole-Garryland Turlough SPA. As there is no direct hydrological connection to this watercourse, there is considered to be no significant risk to this species. The artificial ponds onsite would not support protected fish or crayfish species.

Otter

The proposed development is located within the current known range and favourable reference range of Otter. Otter have been recorded within the 10km tetrad M51. The most recent and closest NBDC record for Otter is located approximately 3.4km to the north-west along the Rooghaun watercourse. The site would be of limited value to Otter given the absence of rivers, streams and drainage ditches onsite. Otter are likely within the wider environment.

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As noted above, no evidence of otter, in the form of spraints, was recorded during the site walkover, however it is considered probable that otter are within the vicinity of the proposed site.

5.5.2.3 Fauna - Bats

The proposed development will require the removal of some existing hedgerows, scrub and one mature tree along the local access road, to facilitate the proposed development. The boundary vegetation will provide continued connectivity to the surrounding areas. All other hedgerows, treelines, scattered trees and parkland habitats will be retained.

Some structures onsite will be removed as part of the planning application.

Desk Based Review

According to NBDC records, the following Bat species were recorded within the 10km tetrad M51, in which the site is located.

- Brown Long-eared Bat (*Plecotus auritus*);
- Natterer's Bat (*Myotis nattereri*);
- Soprano Pipistrelle (*Pipistrellus pygmaeus*);
- Daubenton's Bat (*Myotis daubentonii*);
- Lesser Noctule (*Nyctalus leisleri*)

The development site is located outside of the current distribution, current range and favourable reference range of Lesser Horseshoe Bat (*Rhinolophus hipposideros*) [1303] and Nathusius' Pipistrelle (*Pipistrellus nathusii*) [1317] but within current distribution, current range and favourable reference range of Soprano Pipistrelle (*Pipistrellus pygmaeus*) [5009], Daubenton's Bat (*Myotis daubentonii*) [1314], Leisler's Bat (*Nyctalus leisleri*) [1331], Common pipistrelle (*Pipistrellus pipistrellus*) [1309] and Whiskered Bat (*Myotis mystacinus*) [1330]. The development site is located outside the current distribution but within the current range and favourable reference range of Brown long-eared Bat (*Plecotus auratus*) [1326], Natterer's Bat (*Myotis nattereri*) [1322] (NPWS, 2019c).

The NPWS's National Lesser Horseshoe Bat Roost Database was also consulted with regards any roost records for Lesser Horseshoe Bat (*Rhinolophus hipposideros*). The closest mapped records for this species is located approximately 2.7km to the west near Ardrahan. The Lesser

Horseshoe Bat is mainly confined to the west of Ireland, with no online records of this species within or adjacent the boundary of the site. This species is known to roost in old houses, outhouses, stables or cottages. During the winter it hibernates in caves, disused cellars, mines and souterraines. The habitats onsite would offer limited suitability for this species in terms of roosting.

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Assessment of Bat Roost Potential – Buildings/Structures

The buildings onsite would not offer any suitable bat roosting habitat. They lack any attic space and are comprised of temporary or galvanized structures.

Figure 5.11: **Structures onsite with negligible bat roost potential**

Assessment of Bat Roost Potential – Hedgerows

The majority of hedgerows onsite would offer negligible/low bat roost potential. The hedgerows to the removed are to the centre and south of the site. These hedgerows delineate the field boundaries formed along walled field boundaries and would not be considered of great significance given the sparse connectivity and dominance of bramble as opposed to specific hedgerow species. Some Hawthorn are interspersed along these walled boundaries. These hedgerows are considered as having negligible bat roost potential.

The hedgerow adjacent a bund that separates the topped area to the agricultural grassland would be considered of greater significance. It is dominated by native hedgerow species with two semi-mature Hawthorn towards the west end. It is considered as having low/negligible bat roost potential. This hedgerow is to be removed. While the existing hedgerows and trees are considered as having low/negligible bat roost potential, they could be used by commuting or foraging bats in the area. The removal of this linear feature will have minor temporary residual impacts on local bat populations until the new scheduled planting has become established.

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A hedgerow occurs along the south-east boundary which separates the agricultural shed from the development site. This is to be retained. It is considered as having low/negligible bat roost potential.

Treelines to the west outside the boundary but within the landholding are considered as having negligible/low bat roost potential however a topped Ash tree with a thick cover of Ivy is considered as having low bat roost potential. There are to be no excavation or construction works within this area.

Additional treelines to the south-east outside the red line boundary are considered as having low to moderate bat roost potential due to the presence of a mature Ash and Sweet Chestnut tree. There is significant Ivy cover which could be concealing potential crevices. These trees will be retained as part of the development.


Figure 5.12 (i)

Figure 5.12 (ii)


Figure 5.12 (iii)


Figure 5.12 (iv)


Figure 5.12 (v)


Figure 5.12 (vi)

Figure 5.12: (i) Hedgerow south-east boundary with negligible/low bat roost potential – to be retained (ii) hedgerow centre separating topped area from agricultural grassland with low bat roost potential – to be removed (iii) linear scrub hedgerow to south-east with negligible bat roost potential – to be removed (iv) treeline outside north-west boundary with low bat roost potential – to be retained (v) Conifer treeline to west with low bat roost potential – to be retained (vi) Hedgerow to north (outside red line boundary) with negligible/low bat roost potential – to be retained

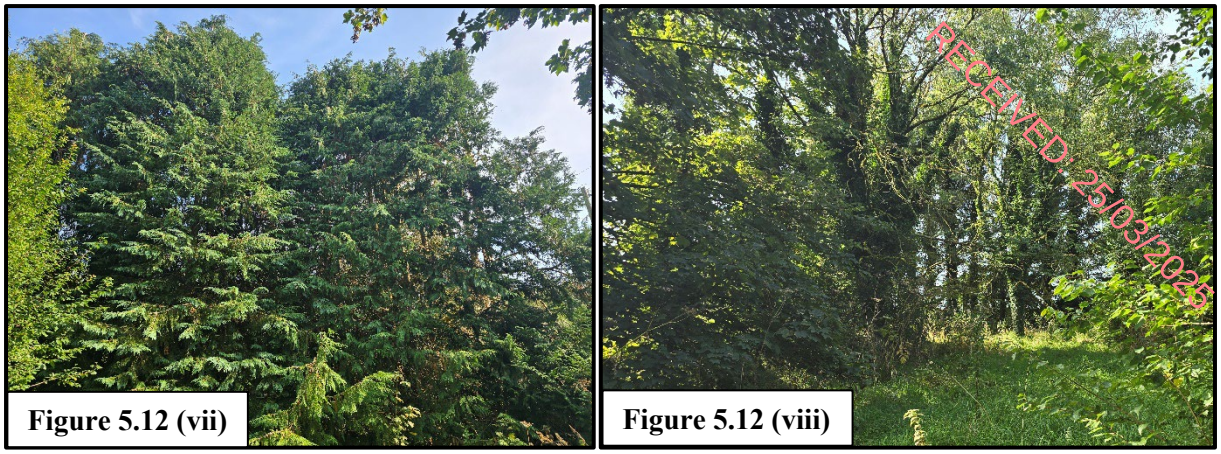

Figure 5.12: (vii) Treeline to the south-east with low to moderate bat roost potential – to be retained (viii) Treeline to the south-east along an agricultural field with low bat roost potential – to be retained

Conclusion

While the majority of the habitats onsite, particularly those to be removed are considered as having low/negligible bat roost potential, A full bat survey will be conducted during the active bat season to determine the presence of bat roosts prior to the removal of any trees onsite. The removal of existing hedgerows would have a minor temporary residual impact until proposed tree and hedgerow planting has become established. In addition, the landscape plan includes for native species, similar to those already present onsite.

5.5.2.4 Avifauna

Given the agricultural land uses of the surrounding area, it would be expected that common grassland and hedgerow bird species would be present in the area. Given the site's distance to the nearest SPA's, it would be expected that waterbird associated with grassland habitats may also be present within the surrounding area of the proposed site. The following table details the bird species recorded during the site walkovers on the 12th and 19th September 2024 and their protection and conservation concern statuses.

Table 5.9: Protection and Conservation Concern Statuses for Recorded Birds

COMMON NAME	SCIENTIFIC NAME	E.U. BIRDS DIRECTIVE	BOCCI* RED LIST	BOCCI* AMBER LIST
Blackbird	*Turdus merula*	-	-	-
Blue Tit	*Parus caeruleus*	-	-	-
Bullfinch	*Pyrrhula pyrrhula*	-	-	-
Chaffinch	*Fringilla coelebs*	-	-	-
Goldcrest	*Regulus regulus*	-	-	✓
Hooded Crow	*Corvus cornix*	-	-	-
Magpie	*Pica pica*	-	-	-

COMMON NAME	SCIENTIFIC NAME	E.U. BIRDS DIRECTIVE	BOCCI* RED LIST	BOCCI* AMBER LIST
Raven	*Corvus corax*	-	-	-
Robin	*Erithacus rubecula*	-	-	-
Rook	*Corvus frugilegus*	-	-	
Snipe	*Gallinago gallinago*	-	✓	-
Stonechat	*Saxicola rubicola*	-	-	-
Swallow	*Hirundo rustica*	-	-	✓

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**The BoCCI (Birds of Conservation Concern in Ireland) List classifies bird species into one of three lists (Red, Amber or Green) based on their conservation status and conservation priority.*

A total of 13 bird species were recorded during the bird survey. Snipe is red listed under the BoCCI classification, while Swallow and Goldcrest are amber listed. None of the bird species recorded are listed under Annex I of the E.U. Birds Directive.

The conservation statuses for the qualifying interests of the Slieve Aughty Mountains SPA are outlined in Table 5.10 below;

CODE	QUALIFYING INTEREST	CONSERVATION STATUS*
A082	Hen Harrier	Amber
A098	Merlin	Amber

** Birds of Conservation Concern in Ireland 2021- 2026 (Gilbert, Stanbury & Lewis, 2021)*
***Sourced from NPWS (2020)*

The conservation statuses for the qualifying interests of the Rahasane Turlough SPA are outlined in Table 5.11 below;

CODE	QUALIFYING INTEREST	CONSERVATION STATUS*
A038	Whooper Swan	Amber
A050	Wigeon	Amber
A140	Golden Plover	Red
A156	Black-tailed Godwit	Red
A395	Greenland White-fronted Geese	Green

** Birds of Conservation Concern in Ireland 2021- 2026 (Gilbert, Stanbury & Lewis, 2021)*
***Sourced from NPWS (2020)*

The conservation statuses for the qualifying interests of the Coole-Garryland SPA are outlined in Table 5.12 below;

CODE	QUALIFYING INTEREST	CONSERVATION STATUS*
A038	Whooper Swan	Amber

** Birds of Conservation Concern in Ireland 2021- 2026 (Gilbert, Stanbury & Lewis, 2021)*
***Sourced from NPWS (2020)*

5.5.2.5 Records of Protected, Rare and Invasive Species

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National Biodiversity Data Centre Records

Flora and fauna records were reviewed on the National Biodiversity Data Centre (NBDC) website for the 10km square (Tetrad M51) in which the proposed development site is situated.

No protected plant species under the Flora (Protection) Order, 2022 (S.I. No. 235 of 2022) were recorded within the 10km square (Tetrad – M51) in which the proposed development site is located. No endangered or threatened flora were recorded within this tetrad.

No invasive plant species listed in the Third Schedule of the European Communities Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011), as Amended 2015 (S.I No. 355 of 2015) were recorded within the 10km square (Tetrad – M51).

Protected fauna species of note recorded within the NBDC 10km square (Tetrad –M51) include the protected species: Common Frog (*Rana temporaria*), Freshwater White-clawed Crayfish (*Austropotamobius pallipes*), Marsh Fritillary (*Euphydryas aurinia*), Brown Long-eared Bat (*Plecotus auritus*), Daubenton's Bat (*Myotis daubentonii*), Badger (*Meles meles*), Pygmy Shrew (*Sorex minutus*), Red Squirrel (*Sciurus vulgaris*), Otter *(Lutra lutra*), Lesser Noctule (*Nyctalus leisleri*), Natterer's Bat (*Myotis nattereri*), Pine Marten (*Martes martes*), Soprano Pipistrelle (*Pipistrellus pygmaeus*) and Hedgehog (*Erinaceus europaeus*).

High impact invasive species listed in the Third Schedule of the European Communities Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011), as Amended 2015 (S.I No. 355 of 2015) include Fallow Deer (*Dama dama*).

Bird species of note include Barn Owl (*Tyto alba*), Swallow (*Hirundo rustica*), Bewick's Swan (*Cygnus columbianus* subsp. *bewickii*), Black-headed Gull (*Larus ridibundus*), Coot (*Fulica atra*), Grasshopper Warbler (*Locustella naevia*), Kestrel (*Falco tinnunculus*), Kingfisher (*Alcedo atthis),* Linnet (*Carduelis cannabina*), Snipe (*Gallinago gallinago*), Starling (*Sturnus vulgaris*), Swift (*Apus apus*), Curlew (*Numenius arquata*), Teal (*Anas crecca*), Tree Sparrow (*Passer montanus*), Wigeon (*Anas penelope*), Golden Plover (*Pluvialis apricaria*), Gadwall (*Anas strepera*), Hen Harrier (*Circus cyaneus*), House Martin (*Delichon urbicum*), House, Sparrow (*Passer domesticus*), Little Egret (*Egretta garzetta*), Little Grebe (*Tachybaptus ruficollis*), Mallard (*Anas platyrhynchos*), Merlin (*Falco columbarius*), Mute Swan (*Cygnus olor*), Northern Lapwing (*Vanellus vanellus*), Peregrine Falcon (*Falco peregrinus*), Red Grouse (*Lagopus lagopus),* Red Kite (*Milvus milvus*)*,* Rock Pigeon (*Columba livia*), Sky Lark (*Alauda arvensis*), Tufted Duck (*Aythya fuligula*), Whooper Swan (*Cygnus cygnus*), Yellowhammer (*Emberiza citrinella*).

Sand Martin (*Riparia riparia*) have been recorded within the 10km tetrad M51 however, the most recent record was from 1991. There are no recent available records for this species within the tetrad.

National Parks and Wildlife Services Records

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The National Parks and Wildlife Service were contacted on the 10th September 2024 in relation to protected, rare and threated species located within the vicinity of the proposed development site. A response was received on the 22nd November 2024 stating technical issues delaying receipt of information. To date, no information has been received.

5.5.3 Water Quality

5.5.3.1 Surface Water

The closest mapped watercourse to the proposed development site is the Meheranspark (EPA Code – 29M07 – Order 1) where it rises approximately 1.1km south-west of the proposed development. It flows for approximately 1km (hydrologically) where it enters an unnamed lake. The Kilchreest (EPA Code: 29K02 – Order 4) is located approximately 1.3km to the south-east of the proposed development. It flows in a south-westerly direction for approximately 3.4km where it becomes part of the Peterswell Turlough SAC. The Kilcolgan (EPA Code: 29K01 – Order 5) is located approximately 6.6km to the north of the site. Refer to figure 5.13 for mapped watercourses within the area.

The Conservation Objectives documents for the Peterswell Turlough SAC and Rahasane Turlough SAC includes water quality objectives such as maintaining the appropriate natural hydrological regime, to maintain nutrient status appropriate to soil types and vegetation and to restore appropriate water quality. According to the Conservation Objectives report, "*Peterswell Turlough SAC should, typically, be naturally oligotrophic and requires targets of ≤20 µg/l TP, <8 µg/l annual mean chlorophyll a, <25 µg/l annual maximum chlorophyll a, and should maintain trace/absent epiphyton as algal mats (<2% cover) to reach favourable condition*". "*Rahasane Turlough was considered to be moderately sensitive to enrichment. A target of ≤20 µg/l total phosphorus may therefore be sufficient to support the natural structure and functioning of the turlough habitat at Rahasane*".

The Kilchreest watercourse has achieved a water quality status of between Q4 (Good) in 1994. The Kilcolgan watercourse has achieved a water quality status of between Q3 (Poor) in recent years (Refer to Chapter 7 – Water for more details).

Figure 5.13: Watercourses within the vicinity of the site

5.5.3.2 Groundwater

Ground water will be assessed separately within this EIAR (Chapter 7). A brief description is provided below.

The proposed quarry extension at Kilchreest is located within a regionally important aquifer as per the Groundwater Data Viewer Maps (GIS, 2025). Groundwater permeability is moderate and well drained while groundwater vulnerability is high. There are a number of karst features within the area however, none are located within the proposed extraction area. According to the only EPA mapping system, the groundwater within the vicinity of the development site has an overall status of good for the years 2016-2021.

According to the hydrological study (Chapter 7), "*The quarry site is located right at the watershed divide and potentially the infiltrating waters could discharge either to the Kilchreest River system (Lough Coy Turlough near Ballylee) to the southwest (part of the Lough Coole Turlough catchment) or migrate northwest via groundwater to the Kilcolgan_040 River (Rahasane Turlough).*"

Given that the site is located within two sub-catchments, there is potential for a groundwater connection to the Peterswell Turlough SAC to the south and the Rahasane Turlough SAC to the north.

The main risks to groundwater from the proposed development are from any chemicals and hydrocarbons during the construction and operational phase.

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5.6 Characteristics of the Proposed Development Site

The proposed development will be a continuation of the current quarrying activity. There are no proposed amendments to the current, inputs, processes or outputs at the existing quarrying activity as part of this application, other than the proposed extension of the activity boundary and extraction areas. The planning application is for the extraction of limestone within 7.5 hectares of the total landholding using convention drilling, blasting techniques and mineral reduction using mobile crushing and screening.

An extraction capacity of up to 120,000 tonnes per annum is sought to provide the applicant with the ability to respond to demand for aggregates in the region. Permission is sought for a period of 25 years in order to extract a known resource.

No clay or materials with the potential to contain invasive flora will be imported. All removed topsoil and subsoils will be used for the construction of berms along the boundaries which will provide raised physical barriers around the site. Any surplus soils will be stored onsite for re-use where required.

The operational hours are Monday-Friday 08:00am to 5:00pm and Saturday 8am to 1pm. Kilchreest Quarry currently carry out excavation works with the removal of bedrock.

The site will be accessed by an existing entrance off the L4219 to the south.

There are several environmental protection measures already in place such as a wheel wash facility, and dust reduction measures. Dust, noise and water quality monitoring is undertaken quarterly. A detailed description of the development is provided at the beginning of this EIAR report with detailed site plans.

5.7 Potential Impacts of the Proposed Development

5.7.1 Impact Criteria

5.7.1.1 Valuation of Ecological Receptors

The main purpose of an EIAR is to identify, describe and present an assessment of the likely significant effects of a project on the environment. Annex III of the amended Directive 2014/52/EU requires that the EIAR should describe effects by reference to the individual environmental factors and their sensitivities:

- The magnitude and spatial extent of the impact (for example geographical area and size of the population likely to be affected)

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- The nature of the impact
- The transboundary nature of the impact
- The intensity and complexity of the impact
- The probability of the impact
- The expected onset, duration, frequency and reversibility of the impact
- The cumulation of the impact with the impacts of other existing and/or approved projects
- The possibility of effectively reducing the impact.

Potential effects of the construction, operational and decommissioning phases of proposed development on biodiversity include:

- Potential Effects on Habitats and Flora
- Potential Effects on Mammals
- Potential Effects on Birds
- Potential Effects on Amphibians and Reptiles
- Potential Effects on Other Species
- Potential Effects from Non-native Invasive Species
- Potential Effects on Water Quality and Aquatic Ecology

5.7.1.2 Significance of Impacts

According to the EPA (2020), significance of effects is usually understood to mean the importance of the outcome of the effects and is determined by a combination of objective (scientific) and subjective (social) concerns.

The EPA further notes that: "*While guidelines and standards help ensure consistency, the professional judgement of competent experts plays a role in the determination of significance. These experts may place different emphases on the factors involved. As this can lead to differences of opinion, the EIAR sets out the basis of these judgements so that the varying degrees of significance attributed to different factors can be understood*".

5.7.2 Determination of Ecological Value

The ecological value of the habitat types and species identified at the proposed development site have been assessed following the criteria outlined in the National Roads Authority (NRA) guidelines (2009). Tables 5.15 and 5.16 below detail the habitats recorded and potential species, and their associated ecological value.

The impacts on the terrestrial habitat are generally restricted to direct removal of habitats onsite. Indirect impacts can occur during the construction and operational phases from disturbance (machinery), noise and deposition of dust. The Dust report states "*It is predicted that the potential for nuisance impact has been and is limited to the immediate vicinity of the existing activities*" while noise levels will not exceed the existing baseline levels.

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Table 5.15: Ecological Value of Identified Habitats of the Proposed Development

HABITAT TYPE	HABITAT RATING	KEY ECOLOGICAL RECEPTOR?	POTENTIAL IMPACT
Improved agricultural grassland (GA1)	Local importance, lower value	No. Species poor habitat. Low ecological value.	This habitat within the red line boundary is to be removed. Negative, slight significance, long-term.
Scrub (WS1)	Local importance, medium value	Yes. May provide habitats for small mammals and nesting birds	This habitat is to be removed. Negative, slight-moderate significance, long-term.
Hedgerows (WL1)	Local importance, higher value	Yes. Area of semi-natural habitat. May provide opportunities for bird nesting and foraging for bats.	These habitats within the red line boundary are to be removed and replaced with a 5m wide vegetated strip. Positive, slight significance - moderate, temporary effects.
Stone walls and other stonework (BL1)	Local importance, lower value	No. Species poor habitat. Would offer limited value to fauna.	This habitat is to be removed. Neutral, not significant, long-term
Buildings and artificial surfaces (BL3)	Local importance, lower value	No. Species poor habitat. Low ecological value.	This habitat is to be removed. Neutral, Not Significant, long-term
Recolonising bare ground (ED3)	Local importance, lower value	No. Species poor habitat. Low ecological value.	This habitat is to be removed. Neutral, Imperceptible, long-term
Spoil and bare ground (ED2)	Local importance, lower value	No. Area of disturbed ground with recolonising vegetation. Low ecological value.	This habitat is to be removed. Negative, Imperceptible, long-term
Active quarries and mines (ED4)	Local importance, lower value	No. Species poor habitat. Low ecological value.	No change to this habitat. Neutral, imperceptible.
Other artificial lakes and ponds (FL8)	Local importance, lower value	No. Species poor habitat. Low ecological value.	This habitat is to be removed.

HABITAT TYPE	HABITAT RATING	KEY ECOLOGICAL RECEPTOR?	POTENTIAL IMPACT
			Negative, not significant, long-term
Dry meadows and grassy verges (GS2)	Local importance, medium value	Yes. Semi-natural habitat comprised of mostly native species. Could offer foraging habitat for mammals.	This habitat is to be removed. Negative, slight - moderate significance, long-term
Scattered trees and parkland (WD5)	Local importance, lower to medium value	Yes. Could provide foraging habitat and ground cover for mammals and birds.	This habitat is to be retained. Neutral, positive, long-term
Treelines (WL2)	Local importance, low to high value	Yes. Could be used by foraging commuting bats and birds. Could be used by nesting birds.	This habitat is to be retained. Neutral, positive, long-term

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Table 5.16: Ecological Value of Species Present / within the Vicinity of the Development

SPECIES	SPECIES RATING	KEY ECOLOGICAL RECEPTOR?
Badger	Local importance, higher value	Yes. Recorded foraging onsite. Areas of scrub has potential to support this species.
Otter	Local importance, higher value	No. Not recorded within the site. The artificial lakes would not support this species. There are also no watercourses or drainage ditches onsite.
Pine Marten	Local importance, higher value	No. Not recorded within the vicinity of the proposed site. Site has limited potential to support this species.
Bats (foraging and commuting habitat only – no bat roosts identified)	Local importance, higher value	Yes. The hedgerows within and adjacent to the proposed development are likely to be utilised by bats for both foraging and commuting.
Hare	Local importance, higher value	No. Not recorded within the vicinity of the proposed site. Site has limited potential to support this species
Other Fauna	Local importance, low to high value	No. Site has limited potential to support other protected fauna species.
Breeding Birds	Local importance, higher value	Yes. All birds, their nests, eggs and young are protected under the Wildlife Act.
Common Lizard	Local importance, higher value	No. Not recorded within the vicinity of the proposed site. Protected under the Wildlife Act.
Freshwater Fauna	Local importance, low to high value	No. There are no watercourses or drainage ditches within the site and no direct hydrological connection to a

SPECIES	SPECIES RATING	KEY ECOLOGICAL RECEPTOR?
		watercourse. The ponds onsite would offer limited potential to support freshwater species.

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5.7.3 Potential Impacts during the Construction Phase

The construction phase of this development relates to site preparation works including vegetation clearance, construction of roads and buildings, drainage (where required), construction of car/truck park etc. The extraction phase as part of the proposed quarrying activities will be discussed within the operational phase further below.

There are no RAMSAR sites within the potential zone of influence of the proposed development. There are a number of Natura 2000 sites and proposed Natural Heritage Areas within the zone of influence. Potential impacts are discussed further below.

As discussed in detail in the accompanying Appropriate Assessment Screening Report prepared for the project (Ref. No. PE_AA_10238), and within Section 5.5.1 above, the European sites considered to be within the zone of influence of the proposed development are the Slieve Aughty Mountains SPA (Site Code: 00004168), Peterswell Turlough SAC and pNHA (Site Code: 000318) due to close proximity and potential groundwater connection, the Rahasane Turlough SPA (Site Code: 004089), the Rahasane Turlough SAC and pNHA (Site Code: 000322) and the Coole-Garryland SPA (Site Code: 004107 due to the presence of grassland habitats for potential link with qualifying species and potential groundwater connection.

Designated Sites – SAC and SPA Sites

The proposed development does not directly impinge on any part of a European site and as such would not be expected to have any in-situ effects upon a protected site through loss or destruction of habitat, fragmentation of habitat, disturbance of habitat or direct reduction in species density or diversity.

It is considered that the proposed development site would not contain the habitats or species for which the Peterswell Turlough SAC/pNHA or the Rahasane Turlough SAC/pNHA have been designated. The habitats Turloughs [3180] and rivers with muddy banks [3270] are not found onsite. The majority of habitats onsite have been modified, and include improved agricultural grassland, some areas of dry meadows and grassy verges, scrub on boundary bunds, active quarries and hedgerows/treelines. The ponds onsite are artificial and as a result of rainwater. The overall area of the ponds is not significant and would not suitably support protected species listed within nearby designated sites. There is also no direct surface water connection from the proposed development to this SAC. The closest mapped examples of Turlough habitat within the Peterswell Turlough SAC is 2.7km to the south-west while the closest mapped example of rivers with muddy banks is 5km to the south-west. The Rahasane Turlough is located 7km to the north-west of the proposed development site. There will be no construction works within either protected site. Therefore, no direct impacts are anticipated.

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The proposed development would not offer suitable breeding or nesting habitats associated with the qualifying interests Hen Harrier and Merlin, for which the Slieve Aughty Mountains SPA has been designated. The habitats within the red line boundary do not contain any areas of moorland, peatland or young forestry plantations associated with these species. There will also be no proposed works within the boundary of the SPA. Therefore, no direct significant effects are anticipated. Merlin prey upon small birds such as Meadow Pipits and Skylark while Hen Harrier prey upon small birds and mammals. The proposed development could be used by Merlin and Hen Harrier for hunting if in the area. Given that most of the trees and hedgerows are to be retained, it is considered that there would be no significant effect on these birds due to a reduction in potential prey species. The landscape plan incorporates new planting of trees and hedgerows providing new nesting opportunities for birds/mammals and hunting opportunities for the qualifying interests of the SPA. Therefore it is considered that the development will not have any indirect impacts on these species. In addition, the grassland and hedgerows habitats are commonly found within the wider environment.

The Rahasane Turlough SPA is designated for a number of bird species, most of which are mainly associated with freshwater habitats. Given that the onsite artificial ponds would not support the qualifying interests, it can be concluded that no suitable nesting or breeding habitats are onsite. The development site does not contain the following habitats: Marshes, lake islands, estuaries, bays, rivers, significant areas of freshwater habitats, peatlands, acid grasslands, wet grassland, coastal habitats, arable land or dune grasslands. Therefore, no direct significant effects are anticipated. The site does contain areas of improved agricultural grassland which could be utilised by Greenland White-fronted Geese, Golden Plover and Whooper Swan for foraging. Given the availability of agricultural grassland within the wider environment, it is considered that the loss of this habitat would not be considered significant and therefore would not be anticipated to have any significant effect on the qualifying interests. The agricultural grasslands within the wider area will still be available. In addition, there is no direct hydrological connection to this SPA. Therefore, it is considered that the development will not have any indirect impacts on these species.

The Coole-Garryland SPA is also designated for Whooper Swan. As noted above, it is considered that the proposed development would not offer any suitable breeding/nesting habitat for this species and suitable foraging habitat would still be available. There is no direct hydrological connection to this SPA. Therefore, no direct or indirect significant effects are anticipated.

During construction works, there is potential for invasive species to be introduced to the development site through the movement of materials, such as soil and stone and the arrival of construction plant and equipment from an area with invasive species. Under Regulation 49(2) of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011) as Amended 2015 (S.I. 355 of 2015), save in accordance with a licence granted under paragraph (7), any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow in any place specified in relation to any plant which is included in Part 1 of the Third Schedule shall be guilty of an offence. Materials containing invasive species are considered “controlled waste” and, as such, there are legal restrictions on their handling and disposal. Under Regulation 49(7) of the European Communities (Birds and

Natural Habitats) Regulations 2011-2015 it is a legal requirement to obtain a license to move "vector materials" listed in the Third Schedule, Part 3. The potential risk of introducing invasive species during the construction phase would be considered low, as no invasive flora species of concern were recorded during the site assessment and given that there would be no significant import of materials with the potential to contain invasive flora species. Soils excavated during construction works would be stockpiled and re-used onsite. Therefore, no importation of topsoil or subsoil would be required as part of the development works. The construction works contractor would also ensure that all equipment and plant would be thoroughly washed and inspected prior to arriving to the development site. Therefore, it is considered that there would be no significant risk of introducing invasive species during construction works from importation of materials or the arrival to site of construction plant and equipment.

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In terms of noise during the construction phase, it is considered that the proposed development is unlikely to have a significant effect on species associated with the Peterswell Turlough SAC, the Rahasane Turlough SPA, the Rahasane Turlough SAC, the Slieve Aughty Mountains SPA and the Coole-Garryland SPA. The nearest designated site is located over 2km from the proposed development. The construction phase will be temporary in nature. Fauna within the area would be accustomed to the existing baseline noise levels from the active quarry and agricultural land activities within the wider environment.

Significant volumes of dust arising from the construction phase of the development would not be considered significant given the proposed works involved.

Potential impacts to groundwater is discussed further below.

It is therefore considered that the proposed development would not have any likely significant effects on the habitats or species of the Peterswell Turlough SAC, the Slieve Aughty Mountains SPA, the Rahasane Turlough SPA and the Coole-Garryland SPA during the construction phase.

Designated Sites – Rahasane Turlough pNHA and Peterswell Turlough pNHA

As noted in Section 5.5.1, the Rahasane Turlough pNHA is located approximately 6.5km from the proposed development while the Peterswell Turlough pNHA is located 2.7km from the proposed development.

Both sites are also listed as Special Areas of Conservation (SAC) as described above. The habitats for which these protected sites have been designated are not found within or adjacent the red line boundary. There is no direct hydrological connection to the designated sites with no proposed works within any watercourse or drainage ditch.

Therefore it would not be expected that the proposed development site will have any in-situ effects through loss or destruction of habitat, fragmentation of habitat or disturbance of habitat during the construction phase.

Habitats and Flora

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The construction phase of the development would result in a direct and permanent loss of the existing habitats as follows: Improved agricultural grassland (GA1), Hedgerows (WL1), Dry meadows and grassy verges (GS2), Scrub (WS1), Other artificial ponds and lakes (FL8), Recolonising bare ground (ED3) and some areas of Buildings and artificial surfaces (BL3). It should be noted that additional habitats such as treelines, hedgerows, grasslands, scattered trees and scrub outside the proposed extension area will be retained. There are no additional vegetation or hedgerow removals planned as part of this development.

Improved agricultural grassland, recolonising/spoil and bare ground and the artificial ponds onsite would be considered modified and of lower ecological value, therefore the loss of these habitats would not be considered significant. The bunds located along the perimeter naturally vegetated over time and are now dominated by scrub. This is a semi-modified habitat however could be important for nesting birds or foraging mammals. The majority of hedgerows to be removed are insignificant given their sparse connectivity and dominance of low linear scrub. However, hedgerows would be considered of higher ecological value for nesting/foraging/commuting wildlife. Their loss would have a negative temporary residual effect until the new proposed planting becomes established.

No protected habitat under the Habitats Directive or listed as part of a designated site are found onsite. The habitats onsite are commonly found throughout Ireland.

The landscape plan seeks to retain most of the existing trees and hedgerows within the landholding. However, it also seeks to replace some existing hedgerows with additional hedgerow and tree planting proposed along the perimeters. In particular to the west and south where a 5m wide strip of vegetation is proposed.

No third schedule invasive flora were recorded with no risk of importation during the construction phase. No rare plant species or protected flora under the Flora (Protection) Order 2022, were recorded within the proposed development area. Therefore, the proposed development would not be considered to impact upon any rare or protected flora species.

Two unscheduled invasive Wall Cotoneaster (*Cotoneaster horizontalis*) and Sycamore (*Acer pseudoplatanus*) were recorded onsite. These can be controlled by herbicides if they become invasive.

As noted above, the proposed development is unlikely to have a significant impact on flora or habitats due to dust or a deterioration in water quality.

Fauna and Avifauna

As noted above, most of the proposed development footprint would take place within modified habitats of lower ecological value, therefore, the potential impact upon fauna due to habitat loss or habitat fragmentation would be reduced. Avi fauna could potentially use the grasslands within the red line boundary. Given that improved agricultural grassland, scrub and hedgerows are commonly found within the wider environment, it is considered that the proposed development would not have a significant impact on the qualifying interests of the Slieve Aughty Mountains SPA, the Rahasane Turlough SPA or the Coole-Garryland SPA. Grasslands within the wider environment would still be available. In addition, the habitats

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onsite would not offer suitable breeding or nesting habitat for the listed species. The artificial lakes are modified and as a result of rainwater run-off. They are insignificant in size with limited invertebrates.

Snipe are red listed under the BoCCI classification. They were observed within the artificial ponds habitats. The proposed development would not offer suitable breeding/nesting habitat for this species and foraging habitat would be limited. There are more suitable foraging and nesting habitats outside the development boundary for this species. Sand Martin are known to dig burrows into exposed vertical sand and fine gravel embankments. No Sand Martin were recorded although the survey was outside the optimum survey period for this species. It is unlikely to utilise the site given that the quarry face is comprised of bedrock as opposed to sandy cliffs.

Evidence of Fox was recorded onsite while the mammal trail camera captured a Badger entering the site, most likely to forage. The construction phase of the development could potentially remove/limit foraging habitat for these species. Although, habitats within the wider area would still be available. Therefore, no significant impact is anticipated. Addition measures have been included below.

While amphibians were recorded during the site assessments, the artificial ponds could support amphibians such as the Common Frog and Smooth Newt. The removal of the artificial ponds will be completed outside of the peak frog breeding season (Spring/Summer) so as to prevent any potential impact should either species be present. No reptiles were recorded onsite.

Direct mortality of fauna may occur due to the use of heavy construction plant, machinery and removal of vegetation. Mortality of fauna is most likely to occur during the mammal and bird breeding season, when young are at their most vulnerable. Vegetation removal would not take place during the bird nesting season (1st of March – 31st of August), greatly reducing the potential for mortality. If it is necessary to undertake some hedgerow / scrub removal works during the bird nesting season, then in such instances a suitably qualified ecologist would be engaged to carry out inspections for the presence of breeding birds prior to any clearance works taking place. Where nests are present, the ecologist would make a decision as to whether a “Licence to interfere with or destroy the breeding places of any wild animals”, is required from the NPWS. Alternatively, the ecologist may establish a suitable buffer zone around an active nest, with removal works rescheduled until chicks have fledged. Where no evidence of nests are found during inspection, hedgerow / scrub removal works must be undertaken within three days of inspection.

Should other protected fauna be present, it is not anticipated that construction works would have a significant impact owing to the extent of the development footprint, the habitat types impacted upon and the duration of construction works. In the event a protected species is encountered during construction works, all works will immediately cease and an investigation will be undertaken by an ecologist. Where required, an officer of the NPWS would be notified prior to the resumption of construction works.

Construction works have the potential to disturb fauna due to the generation of construction noise. However, construction noise would not be considered to pose a significant risk to fauna given that all vehicles where possible would be equipped with mufflers to suppress noise, as is standard practice. Where possible, no construction works would be conducted outside of normal working hours, therefore there would be no disturbance to nocturnal species. In addition, fauna within the area would be accustomed to noise commonly audible within the surrounding environment.

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The potential impact upon fauna due to a deterioration in water quality is discussed in the "*Water and Biodiversity*" section below. In brief, the development is unlikely to have any significant effect on fauna due to a deterioration in water quality given the absence of any direct hydrological connection to surface waters.

Bats

Construction works have the potential to result in direct and indirect impacts on local populations of bats through habitat loss (vegetation clearance, tree felling) and disturbance (increased lighting) potentially affecting existing foraging areas and commuting routes. The majority of bat species utilise linear features, such as hedgerows and treelines and areas of mature vegetation for foraging and commuting.

The proposed development will require the removal of some areas of scrub and hedgerows. This will have a negative but temporary impact on local bat populations until the new planting schedule becomes established. The hedgerows to be removed are considered as having negligible to low bat roost potential but were identified as possible foraging and commuting routes within the wider environment. The existing hedgerows offer good connectivity to the surrounding landscape. The loss of these features would have a negative, temporary residual impact until the new planting schedule has become established. The proposed 5m vegetated strips along the new perimeter of the site will increase invertebrates and overall will have a positive impact on bats. Therefore, it is not anticipated that the proposed development would have a significant impact upon bat species due to habitat loss. The new linear features will ensure continued connectivity to the surrounding landscape.

Artificial lighting during the construction phase has the potential to negatively impact upon bat species, as illumination can impact upon their roosting sites, commuting routes and foraging areas. While some bat species, such as Leisler's bats (*Nyctalus leisleri*), may take advantage of prey concentrating around light sources, other bat species are sensitive to lighting and will avoid artificially lit up areas. This can potentially sever commuting and foraging routes. As noted above, construction works would not be conducted outside of normal working hours where possible, which would considerably reduce the potential impacts upon bat species. Measures with regards artificial lighting during the construction phase, as outlined in Section 5.8, will be required to be implemented to reduce the potential impact of light pollution.

Water Quality and Biodiversity

The construction phase of projects has the potential to impact upon flora and fauna due to a deterioration in water quality. Risks to water quality could arise due to the potential release

of suspended solids during soil disturbance works, the release of uncured concrete and the release of hydrocarbons (fuels and oils).

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Suspended solids could become entrained in surface water run-off and could affect aquatic habitats through deposition. An increase in sediments has the potential to impact upon fish by damaging gravel beds required for spawning, smothering fish eggs and in extreme cases, by interfering with the gills of fish. An increase in suspended solids has the potential to reduce water clarity, which can impact the light penetration of water and may also affect certain behaviours of aquatic fauna such as foraging success. Aquatic flora and fauna could also be impacted upon by an increase in nutrients which are bound to suspended solids. A significant increase in nutrients can result in excessive eutrophication, leading to deoxygenation of waters and subsequent asphyxia of aquatic species.

In the event suspended solids become entrained in surface water run-off during the construction phase, there is considered to be no significant risk of impact on water quality as suspended solids would likely be retained on site as run-off percolates to the ground and given the distance to any nearby mapped watercourses. There are no watercourses or drainage ditches onsite and therefore, no direct hydrological connection to any surface waters within the wider environment.

A potential source of chemical contamination of surface water would be from the release of hydrocarbons (oils, fuels) from construction plant and equipment. Hydrocarbons can affect water quality, potentially resulting in toxic and / or de-oxygenating conditions for aquatic flora and fauna. Pollution could occur in a number of ways, such as neglected spillages, the storage handling and transfer of oil and chemicals and refuelling of vehicles. The main potential impacts from the proposed development to groundwater would be from infiltration of hydrocarbons from machinery and fuels onsite during the construction phase. There will be no re-fuelling within the proposed and existing extraction areas. The construction phase comprises site clearance, drainage and construction of new proposed buildings/roads. This will take place on higher ground as opposed to the base of the extracted quarry. Therefore, any risks considered with hydrocarbons are low. Surface water run-off will percolate to ground.

Another potential source of contamination of surface water would be the release of uncured concrete. In the event of uncured concrete entering a waterbody, the pH would be altered locally, potentially leading to the death of aquatic flora, fish and macroinvertebrates and alteration to the waterbody substrate. The risk of water quality deterioration as a result of uncured concrete would be considered low, given that precast concrete would be used where possible and surplus concrete would be returned to the batching plant.

There are no anticipated impacts due to a deterioration in water quality during the construction phase. Standard construction mitigation measures will be implemented during the course of the construction phase. These measures are outlined in Section 5.8.

5.7.4 Potential Impacts During the Operational Phase

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Designated Sites

It is considered that the proposed development site does not contain the habitats or species for which the Natura 2000 sites, Slieve Aughty Mountains SPA, Peterswell Turlough SAC and pNHA due to close proximity, the Rahasane Turlough SPA, the Rahasane Turlough SAC and pNHA and the Coole-Garryland SPA have been designated. In addition, the habitats onsite are not protected under the Habitats Directive. No faunal species associated with any of Natura 2000 sites within the zone of influence were recorded onsite during the ecological surveys. The site would have limited potential to support any of the qualifying interests during the operational phase given that the majority of the site will have been modified.

It is not envisaged that protected species would be adversely impacted upon by the development due to noise generated by the proposed quarry extension, distance to protected sites and design of the quarry face. The surrounding area is located within a rural setting and adjacent the existing quarry to the east. Fauna in the area would be accustomed to human generated noise from the existing quarry. A noise and vibration impact assessment report has been prepared by AONA Environmental Consulting Ltd to accompany the Environmental Impact Assessment Report (EIAR). It is recommended that during the operational phase "*sound levels attributable to all on-site operations associated with the development shall not exceed 55 dB(A) L_{eq} over a continuous one hour period between 0700 hours and 1900 hours on Monday to Friday inclusive, and 0700 hours and 1400 hours on Saturday, when measured at any noise sensitive receptor. Sound levels shall not exceed 45 dB(A) at any other time*". Some sources of noise such as blasting or drilling will not be undertaken daily but rather over two days every two months. The existing background noise level L_{A90} is approximately 31 dB(A) and were "*noted to be insignificant at the noise sensitive receiver locations along the local road*." The noise predictions are based on a worst case scenario and determined that "*There is no predicted exceedance of the noise limit of 55 dB $L_{Aeq,\ 1\ Hour}$ during the quarry face removal, associated crushing and screening of the mineral and transport off site. A highest predicted noise level of <50 dB $L_{Aeq,\ 1\ Hour}$, occurs during all of the future proposed extraction Phases at a noise sensitive receivers when extraction in the proposed extraction area progresses from Phase 1 - 5*." The proposed quarry face design will act as an effective noise barrier to sensitive locations. Given the nature and operational hours of the quarry, it is considered that predicted noise levels would not cause a significant impact on nocturnal fauna. The quarry is active during the day and birds/mammals within the vicinity of the site would be accustomed to the noise from movement of vehicles and machinery at the site. The report concludes that "*when the measured baseline noise levels and the predicted noise levels from the proposed mineral extraction are compared, there will be no exceedance of the relevant noise limits*." Therefore, no significant impacts in relation to noise are anticipated.

The potential disturbance on protected habitats and species due to dust during the operational phase would not be considered significant. According to the Air quality and dust impact assessment prepared as part of the accompanying Environmental Impact Assessment Report (EIAR), there is no Irish statutory standards or EPA guidelines relating to dust depositions for inert materials. Recommendations on dust limits are based on the German TA Luft Dust air quality standards - Total dust deposition (soluble and insoluble): 350 mg/m^2/day (when averaged over a 30-day period). The potential for any significant effects on ecological receptors was also undertaken. According to the assessment, the site is located within Zone

D (good quality). The report states "*There are no sensitive habitats in close proximity to the quarry with the Slieve Aughty SPA located 2.7 km south-east of the proposed development and Peterswell turlough SAC located 2.8 km south-west of the proposed development. Therefore, no further assessment of the potential ecological effects resulting from the predicted dust impact is required*." "*It is predicted that the potential for nuisance impact has been and is limited to the immediate vicinity of the existing activities*." In addition, regular dust monitoring is undertaking as part of the operational phase of the development to ensure dust deposition rates are below the recommended threshold. Other than standard measures for the control of dust, it is considered that the proposed development will not have a significant impact on any protected habitat or species listed as part of the Peterswell Turlough SAC/pNHA, the Slieve Aughty Mountains SPA, Rahasane Turlough SPA, the Rahasane Turlough SAC/pNHA and the Coole-Garryland SPA.

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Standard mitigation measures to minimise an impact on protected habitats and species from dust and noise are detailed in Section 5.8.

There are no watercourses or drainage ditches within or adjacent the boundary of the site. Therefore, there is no direct hydrological connection to any protected site.

During the operational phase of projects, a deterioration in water quality can arise through the release of suspended solids and the release of hydrocarbons, which could potentially impact upon protected habitats or species. Given that no works would take place within a watercourse or drainage ditch and absence of a direct hydrological connection to any protected site, the risk of the proposed development impacting upon water quality would be reduced. This is discussed further within the *water quality and biodiversity* section below.

Standard control measures for water quality protection are detailed in Chapter 7. These measures are not required for the protected of any Natura 2000 site but rather as good practice.

Habitats and Flora

No additional habitats are predicted to be removed during the operational phase. The landscape plan proposes to retain as much of the existing hedgerows and trees as possible while fortifying the boundaries of the site with new planning of trees and hedgerows. Once these habitats become established, they will be of benefit to local wildlife, acting as wildlife corridors and refuge. The planting schedule will include native and non-native non-invasive species within its design.

During operational works, there is potential for invasive species to be introduced to the proposed development site through the movement of materials, such as soil and stone, and the arrival of construction plant and equipment from an area with invasive species. The proposed development will not require the importation of materials likely to contain invasive species. Therefore, no risks associated with invasive species are anticipated.

Dust emissions may arise during operational activities, in particular during earth-moving works, which may have the potential to impact upon photosynthesis, respiration and

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transpiration processes of flora due to the blocking of leaf stomata. However, given the standard working practices including dust control at the quarry, the potential impact to flora would not be considered significant.

The potential impact upon habitats and flora due to a deterioration in water quality is discussed in detail below.

Fauna and Avifauna

Common garden and grassland birds were recorded onsite with the exception of Snipe. These common birds would be able to utilise the retained hedgerows and trees.

Direct mortality of fauna may occur due to the removal of vegetation at the site and through access of open construction /quarrying areas. In addition to the use of heavy construction plant and machinery. Mortality of fauna is most likely to occur during the mammal and bird breeding season, when young are at their most vulnerable. Mammals using the site for foraging could accidentally fall into the extraction area. A badger/mammal proof fence will limit access for mammals during the operational phase.

Should protected fauna be present or establish setts/breeding sites, it is not anticipated that operational works would have a significant impact owing to the habitat types impacted upon and the quarrying activities already within the vicinity of the proposed extension area. There will be no additional construction or excavation works outside what is already proposed.

The planting schedule will provide ample opportunities for foraging mammals such as badger or avi-fauna in the area. The 5m vegetated strip will create new nesting/foraging opportunities for mammals and birds also. Therefore, the planting schedule will have a positive impact on mammals and birds.

Operational works have the potential to disturb fauna due to the generation of operational noise. However, operational noise would not be considered to pose a significant risk to fauna owing to the ongoing nature of works and given that all vehicles where possible would be equipped with mufflers to suppress noise, as is standard practice. Where possible, no operational works would be conducted outside of normal working hours, therefore there would be no significant disturbance to nocturnal species. As noted further above, the predicted background noise levels are not expected to increase above the existing baseline noise levels.

Bats

The majority of bat species utilise linear features, such as hedgerows and treelines, and areas of mature vegetation for foraging and commuting. There would be no loss of any known bat roosts during the operational phase. A majority of the trees and hedgerows are to be retained.

Artificial lighting during the operational phase has the potential to negatively impact upon bat species, as illumination can impact upon their roosting sites, commuting routes and foraging areas. While some bat species, such as Leisler's bats (*Nyctalus leisleri*), may take advantage of prey concentrating around light sources, other bat species are sensitive to lighting and will avoid artificially lit up areas. This can potentially sever commuting and foraging routes. As

noted above, operational works are not anticipated to be conducted outside of normal working hours, which would considerably reduce the potential impacts upon bat species. As the site is currently an active quarry there is lighting already in place for health and safety. Additional lighting will be required and will be positioned on the new proposed buildings, directed away from any trees or hedgerows. Therefore, significant impacts in terms of lighting during the operational phase are not expected.

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Measures with regards artificial lighting, as outlined in Section 5.8**,** would be required to be implemented to reduce the potential impact of light pollution.

Water Quality and Biodiversity

Operational works have the potential to impact upon flora and fauna due to a deterioration in water quality. Risks to water quality could arise due to the potential release of suspended solids during aggregate recycling works and the release of hydrocarbons (fuels and oils).

During the operational phase, any re-fuelling of machinery will be undertaken on higher ground at the truck/car parking area and over a designated re-fuelling slab. Any hydrocarbon run-off would be directed to a new soakpit and will pass through a petrol interceptor prior. All hydrocarbons (including an 8,000 litre tank of diesel) will be bunded while al chemicals and oils will be stored within the new maintenance shed. Therefore, the risk of hydrocarbons significantly impacting any protected habitat or species via groundwater is considered low. The report within the accompanying EIAR (Chapter 7) states in reference to potential groundwater impacts "*There is no specific mitigation required to protect any of the European and national Sites that have a hydrological pathway from the quarry site to these receptor in respect to pollution*." The report also states "*The potential impact to the hydraulically connected sites is pollution through accidental spillage of hydrocarbons associated with the Quarrying activities. Such a risk is relatively low given the scale of the quarry and extremely localised given the relatively low productive aquifer based on previous pump testing and the water management experience for the existing quarry activities*."

Operational works would be confined to the proposed development footprint where possible. There are no proposed works within any watercourse or drainage ditch with any direct hydrological connection to a protected site. Surface water comprised of rainwater run-off from the buildings will be directed to new soakpits while surface water from the roads and car/truck park will percolate to ground via permeable substances (gravel).

Foul water will be directed to an existing waste water treatment system and percolation area. This is located greater than 10m from a watercourse or drainage ditch as per the EPA Code of Practice.

Accidental leakage or discharge of chemicals and pollutants would have a minor impact on the fauna and flora due to the low volume of potentially hazardous substances that would be stored on site. Site operators would be informed of the importance of good housekeeping practices, including the immediate cleaning of spillages. In addition, water quality mitigation measures have been included below to prevent any potential impact on water quality.

The principal legislation governing the control of the ambient quality of surface waters under the Water Framework Directive is the European Communities Environmental Objectives (Surface Waters) Regulations [S.I. No. 272 of 2009] as amended. This legislation sets out legal limits for parameters of water quality in the form of thresholds for quality status; pristine, good, moderate, and poor. All waters are required to achieve at least "good status" within timeframes set under the regulations. Under the Surface Water Regulations classification system, a waterbody is classified based upon the lowest score attained for any of the determining parameters (River Waterbody: Q-rating, BOD, orthophosphate, ammonia, temperature, pH, heavy metals and priority substances).

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Standard operational control methods for the protection of surface waters would be implemented during the operational phase of the development and are outlined in Chapter 7. These mitigation measures are for good practice as opposed to protection of a designated site.

5.7.5 Cumulative Impact

Considering the nature of the development, the existing onsite operating quarry and adjacent, closed Roadstone Quarry, it is considered that the main potential cumulative impact upon biodiversity would be a deterioration in water quality, dust and noise during the operational phase resulting in an impact upon protected flora and fauna species and disturbance to species.

The closest registered active quarries are located approximately 6km to the north-west and 13km to the north-east of the site. There are no additional active extractive industries within proximity to the site.

The main activities in the area that would act in combination to the proposed development are agricultural and residential activities.

However, with regards to water quality, it is not anticipated that there would be any significant impact upon water quality during the operational phase, given that all stormwater from the site will percolate to ground and surface water from the proposed refuelling slab will pass through a petrol interceptor prior to a soakpit. A wheel wash is currently in operation.

As noted previously, the expected noise levels are not anticipated to be greater than the existing baseline noise levels. The quarry face is designed to minimise noise disturbance. Given the distance to the nearest designated sites, an impact due to dust is not anticipated. Standard measures are and will be implemented to prevent any impact from noise and dust.

With regards potential habitat loss or fragmentation of habitat, the proposed development is not anticipated to result in a significant impact upon habitat loss / fragmentation during either the operational phase or construction phase. The landscape plan will incorporate additional planting of a 5m strip along the boundaries. Native and non-native non-invasive species will be incorporated into the design. The proposed planting will strengthen existing linear features

and connectivity to the surrounding environment while providing new nesting and foraging opportunities. There will be no works within any designated site or protected site.

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No mitigation measures for the protection of surface water or groundwater to protect a designate site are required. There will also be no construction works within any watercourse or drainage ditch. Surface water will be directed to ground and new soakpit while re-fuelling will only be undertaken on a proposed re-fuelling pad.

Therefore, there would be no cumulative habitat loss or fragmentation impacts, deterioration in water quality, dust or noise impacts which could pose a significant risk to biodiversity.

5.7.6 "Do-Nothing" Impact

Should the development not go ahead, there would be no change to the environmental impacts of the existing site. The lands would likely be continued to be used for industrial and agricultural purposes. If left alone the site would likely go through plant succession. However, given the large amount of material removed from the site this would leave a significant impact on the wider environment. In addition, if the quarry is left to naturally fill with rain water, the water can be very deep with high mineral contents that make the water colder and less ecologically active compared to natural lakes.

Should the development not go ahead, there would be no changes to the existing water quality, habitats or species within the nearby watercourses or Natura 2000 sites. As these habitats within the site are commonly found throughout Ireland, it is unlikely that the proposed site would be of significant ecological value in the future.

Birds of prey may utilise the quarry if it is left in its current state. The site is unlikely to be utilised by wintering aquatic birds.

5.7.7 "Worst Case" Scenario

In the absence of mitigation measures during the construction phase, there is unlikely to be any significant risk of a deterioration in water quality during the construction phase or operational phase that could have a significant impact on a designated site. There are no watercourses within the red line boundary or adjacent the site. A potential impact to groundwater sources could occur given that the proposed development is located within a karst region. As noted within the water chapter, "*Such a risk is relatively low given the scale of the quarry and extremely localised given the relatively low productive aquifer based on previous pump testing and the water management experience for the existing quarry activities*. *The overall assessment is that the proposed development will have no perceptible impact on the hydrology and hydrogeology of any European or national important Site*."

In the absence of mitigation measures, there is potential for a moderate impact on breeding birds and bats due to the removal of potential nesting, commuting and foraging habitats onsite, particularly during the breeding season. One mature tree is to be removed as part of this development. There is potential that this tree could be used by bats. A full bat survey will

be conducted during the active bat season to determine the presence of any bat roosts prior to hedgerow and tree removal. There would also be a potential impact to the foraging route of Badger, which have been identified as using the lands. Although no evidence of Badger setts were identified onsite, Badger could become established prior to the construction works. Therefore, mitigation would be required to prevent Badger from entering the site during the construction phase. An ecologist will be onsite during the clearance of scrub and will conduct a survey prior to removal whilst also supervising the removal to ensure no presence of Badger setts or protected species.

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Impacts from dust and noise would not be expected to cause significant impacts to protected flora and fauna in the absence of mitigation measures.

5.7.8 Potential Impacts Pre-Mitigation

Table 5.17 below provides a summary of the potential impacts of the proposed development pre-mitigation, during the construction/operational phases.

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Table 5.17: Summary of Predicted Impacts Pre-Mitigation

IMPACT	DEVELOPMENT PHASE	DIRECT / INDIRECT	LIKELIHOOD	DURATION	REVERSIBLE	SIGNIFICANCE	IMPACT TYPE
Habitat Loss	Construction & Operational	Direct	Certain	Permanent	No	Slight significance	Positive
Introduction of Invasive Flora Species	Construction	Direct	Unlikely	Temporary	Yes	Slight significance	Negative
Fauna Disturbance	Construction	Direct/Indirect	Likely	Temporary	Yes	Slight significance	Negative
	Operational	Indirect	Unlikely	Permanent	Yes	Not significant	Neutral
Fauna Mortality	Construction	Direct	Dependent upon timing of works relevant to breeding season	Permanent	No	Moderate significance	Negative
Bats – Disturbance / Severance of Habitat	Construction	Direct/Indirect	Possible	Temporary	Yes	Slight significance	Negative
	Operational	Indirect	Possible	Permanent	Yes	Slight significance	Neutral
Surface Water Quality Deterioration	Construction	Indirect	Unlikely	Temporary	Yes	Slight significance	Neutral
	Operational	Indirect	Unlikely	Permanent	Yes	Not significant	Neutral
Designated Sites	Construction & Operational	Indirect	Unlikely	Permanent	No	Not significant	Neutral

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5.8 Mitigation Measures

5.8.1 Construction Phase

The mitigation measures outlined below will be implemented to ensure there is no significant impact upon the biodiversity of the area and designated sites during the construction phase of the development. The construction phase includes the removal of vegetation (scrub, grassland and hedgerows etc) and topsoil/subsoil, construction of carpark/truck park, construction of buildings, roads and drainage etc.

General Mitigation Measures

- Training of relevant personnel on monitoring and mitigation measures that will be implemented during the construction phase at the development site by way of a toolbox talk;
- All construction works will be confined as far as possible to the development footprint;
- All plant machinery and equipment will be maintained in good working order and regularly inspected;
- Where possible, no construction works will be conducted outside of normal working hours.

Habitats and Flora

- Regular site inspections would be undertaken to ensure that no spread of invasive species has taken place;
- The site contractor would ensure that all equipment and plant is inspected for the presence of invasive species and thoroughly washed prior to arriving/leaving the development site;
- In the event of any invasive species listed in Part 1 of the Third Schedule spreading onsite, works within the immediate vicinity would cease until the invasive plant has been appropriately treated in accordance with Regulation 49 of the European Communities (Birds and Natural Habitats) Regulations 2011-2015;
- Cognisance would be taken of National Roads Authority's Guidelines on "*The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads*";
- Any excavated soil during earth-moving activities and excavations would be segregated into subsoil and topsoil and reused in reinstatement activities.
- Only native and non-native invasive species will be used as part of the landscape plan.
- Cognisance would be taken of the National Roads Authority's Guidelines on "*The Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes*".

Fauna (excluding Badger)

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- As a minimum, the site operator would comply with all legislative provisions relating to hedgerow / tree removal and the protection of birds, and would have regard to reducing impacts on nesting birds;
- In instances where hedgerow / tree removal is required during the bird nesting season (1st of March – 31st August inclusive), the trees required for removal would be inspected by a suitably qualified ecologist prior to any removal works for the presence of breeding birds. Where nests are present, the ecologist would make a decision as to whether a "Licence to interfere with or destroy the breeding places of any wild animals", is required from the NPWS. Alternatively, the ecologist may establish a suitable buffer zone around an active nest, with removal works rescheduled until chicks have fledged. Where no evidence of nests is found during inspection, hedgerow / tree removal works must be undertaken within three days of inspection;If any bird that utilizes quarries for nesting is found actively using the site, then measures must be taken to prevent directly disturbing this species while they are actively nesting. The site is currently in use as an active quarry with any potential nesting birds accustomed to the noise and human activity associated with quarries;
- Should a protected fauna species such as badger, bat or any other protected species be found during the construction phase of the project, works will immediately cease, an investigation will be undertaken by an ecologist and where required, an officer of the NPWS would be notified prior to the resumption of works;
- The landscape plan proposes new hedgerow and tree planting. These will include the use of native and non-native non-invasive species;
- The planting of new linear features to connect to the surrounding environment;
- The maintenance of an unmanaged area along hedgerows and around the perimeter to provide a safe wildlife commuting route for fauna;
- Lighting will be sensitive to nocturnal species and will be directed away from hedgerows and trees;
- To reduce the potential for disturbance due to noise, all plant and machinery will be maintained in good working order and regularly inspected, where possible vehicles would be equipped with mufflers to suppress noise and where possible, no operational works would be conducted outside of normal working hours.
- As a biodiversity enhancement measure ten bird nesting boxes (various types including open fronted and entrance hole) could be incorporated within the design.
- Machinery must be used sensitively and appropriately by a skilled operator;

Badger

- Control measures will be put in place with regard to Guidelines for the Treatment of Badgers Prior to the Construction of National Road Schemes (NRA 2006);
- The construction site will be made safe for mammals with hazards such as open holes covered over or fitted with ramps to allow for escape. Guidelines on what to do for both active and inactive sets must be followed if a badger sett is found during site clearance works;
- A stock proof fence including Badger proof fence will be installed along the boundary of the site that will limit access to the site for large mammals such as Badger.
- Where possible, no construction works would be conducted outside of normal working hours, to reduce potential noise disturbance to nocturnal species;

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- An ecologist will be onsite during the removal of scrub area. A mammal survey will be conducted prior to any vegetation removal to assess for any new signs of protected species using the site. The ecologist will supervise the removal of the vegetated bunds to ensure no protected species of evidence of protected species is present. One the ecologist is satisfied that there is no evidence of protected species, removal of topsoil and grasslands can commence.
- Should a Badger sett be found during the construction phase of the project, works will immediately cease, an investigation will be undertaken to ascertain if the sett is active, and an officer of the NPWS will be notified prior to the resumption of construction works.

Bats

Habitat Loss

- A full bat survey of activity will be carried out during active season (end March/April to September) for bats to determine if and what species of bats are active at the site. An inspection of any trees scheduled for removal will be undertaken to ascertain the presence of any bat roosts prior;
- Maintaining an unmanaged buffer zone along treelines/hedgerows such as scrub or tall grasses would provide habitat for invertebrates for bats to feed on;
- See Bat Conservation Ireland Guidelines on hedgerow management for bats. https://www.batconservationireland.org/wp-content/uploads/2022/07/Managing-Hedgerows-for-Bats.pdf
- No chemicals will be used within the development zone and will not be used near treelines and hedgerows;

Artificial Lighting

- Where required, construction works in the hours of darkness, when bats are active (April – October), will be kept to a minimum;
- Lighting of hedgerows / trees will be avoided where possible;
- Should lighting be required during construction works, it will be of a low height (without compromising safe working conditions) to ensure minimal light spill. Where possible and where practicable to do so, timers or motion sensors would be used;
- Directional lighting will be used where possible, by use of louvres or shields fitted to the lighting;
- White light emitting diode (LED) will be used where possible, which is considered to be low impact in comparison to other lighting types;
- Site lighting will be provided with the minimum luminosity sufficient for safety and security purposes to avoid shadows cast by the site hoarding on surrounding footpaths, roads and amenity areas.

Water Quality

As noted in Section 5.7, no adverse impacts upon water quality are anticipated. However, mitigation measures stated within Chapter 7 will be implemented by the construction works contractor as standard practice.

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5.8.2 Operational Phase

The mitigation measures outlined below will be implemented to ensure there is no significant impact upon the biodiversity of the area and designated sites during the operational phase of the development. In addition, all quarrying and related activities will follow best site management practices as outlined by the EPA "Environmental Management In The Extractive Industry" thereby reducing the potential impact on the environment (EPA, 2006).

General Mitigation Measures

- All operational works will be confined as far as possible to the development footprint;
- All plant machinery and equipment will be maintained in good working order and regularly inspected;
- Where possible, no works will be conducted outside of normal working hours;

Habitats and Flora

- Where additional landscaping may be required, only native and non-native non-invasive species will be used;
- In the event of any invasive species listed in Part 1 of the Third Schedule spreading onsite, works within the immediate vicinity would cease until the invasive plant has been appropriately treated in accordance with Regulation 49 of the European Communities (Birds and Natural Habitats) Regulations 2011-2015;
- Cognisance will be taken of National Roads Authority's Guidelines on "*The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads*";

Fauna

- As a minimum, the site operator will comply with all legislative provisions relating to hedgerow / tree removal/management and the protection of birds, and would have regard to reducing impacts on nesting birds;
- No removal of hedgerows, trees or scrub clearance will be undertaken during the bird nesting season (1st of March – 31st August inclusive).
- The maintenance of an unmanaged area along hedgerows and around the perimeter to provide a safe wildlife commuting route for fauna;
- Maintenance of a hoarding fence around the perimeter of the site to prevent access of mammals such as Badger.

Bats

Artificial Lighting

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The operational hours of the proposed development will be mostly during the day. During the winter months, lighting may be required in the morning or evenings as the days become shorter. There is no formal lighting plan as part of this development. Lighting will only be installed on the proposed buildings for safety purposes. The remainder of the site will remain relatively light free apart from the movement of machinery. The following mitigation measures will be implemented during the operational phase.

- Operational works in the hours of darkness, when bats are active (April – October), will be kept to a minimum;
- Lighting will be directed to where it is required only;
- Lighting of hedgerows / treelines will be avoided where possible;
- Should lighting be required during operational works, it would be of a low height (without compromising safe working conditions) to ensure minimal light spill. Where possible and where practicable to do so, timers or motion sensors would be used;
- Directional lighting will be used where possible, by use of louvres or shields fitted to the lighting;
- White light emitting diode (LED) would be used where possible, which is considered to be low impact in comparison to other lighting types.
- The use of specialist bollard or low-level downward directional luminaires to retain darkness above should be considered;
- All lanterns calculated at 0° tilt;
- Lighting will be of low height where possible, to minimise light spill;
- Where possible and practicable to do so, timers or motion sensors would be used;
- All luminaires will lack UV elements when manufactured. Metal halide, fluorescent sources should not be used;
- Dark buffer zones can be used to separate habitats or features from lighting by forming a dark perimeter around them;
- Light spill into the surrounding environment is minimal;

Water Quality

The following standard mitigation measures will be implemented as good practice:

- The site contractor will adhere to standard construction/operational best practice, taking cognisance of the Construction Industry Research and Information Association (CIRIA) guidelines "*Control of Water Pollution from Construction Sites; guidance for consultants and contractors*" 2001 and "*Control of Water Pollution from Construction Sites – Guide to Good Practice*", 2002;
- All plant machinery and equipment will be maintained in good working order and regularly inspected;
- Any fuels, oils or chemicals would be stored in accordance with the EPA guidance on the storage of materials, in designated bunded areas at the temporary site compound, with adequate bund provision to contain 110% of the largest drum volume or 25% of the total volume of containers;

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- Fuels / oils will be handled and stored with care to avoid spillage or leakage;
- All loading and unloading of hydrocarbons will take place within the bunded area;
- Deliveries of fuels and oils to the site will be supervised;
- Any waste fuel / oils will be collected in bunded containers at a designated area within the site compound and properly disposed of to an authorised waste contractor;
- Spill kits, with an adequate stock of spill clean-up materials such as booms and absorbent pads, will be readily available;
- The site operator will ensure the relevant site personnel are trained in spillage control;
- In the unlikely event of a hydrocarbon spillage, contaminated spill clean-up material will be properly disposed of to an authorised waste contractor;
- Where appropriate, small construction plant equipment will be placed on drip trays;
- Where re-fuelling of construction plant is required to take place onsite, re-fuelling would be undertaken within a bunded area over the designated re-fuelling pad. Under no circumstances would re-fuelling take place within the vicinity of a watercourse or drainage ditch;
- Re-fuelling onsite will only be undertaken by experienced and trained personnel;

In addition to the above measures, the construction works contractor would take cognisance of the following guidelines:

- CIRIA, 2001: *Control of Water Pollution from Construction Sites; guidance for consultants and contractors*;
- CIRIA, 2002: *Control of Water Pollution from Construction Sites – Guide to Good Practice*;
- IFI, 2016: *Guidelines on Protection of Fisheries During Construction Works in and adjacent to Waters*.

Dust and Noise Control

Operational works have the potential to impact upon traffic volumes in the area, which may subsequently impact upon the generation of noise and dust emissions. The site operator would undertake site entrance works to facilitate traffic associated with the proposed development. A wheel wash is currently installed at the site with additional dust control measures such as sprinklers currently in operation on the access road as a measure to control dust entering and leaving the site. In addition to the mitigation measures included within the Noise and Dust chapters, the site operator would ensure the following:

- Deliveries to the site will be via suitably contained vehicles, with sheeting and covers where required; and materials will not be delivered to the site until required;
- The construction traffic will be required to coordinate and schedule all deliveries to the site, ensure that all access roads are kept clear of mud and debris;

- Where possible, large-scale vehicle movements will be timed outside peak hours on the local road network.
- Deliveries to the site will be scheduled during the operational hours of 8:00am to 5:00pm Monday to Friday, and 8:00am to 1:00pm on Saturdays;

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- Cognisance will be taken of the National Roads Authority's "*Guidelines for the Treatment of Noise and Vibration in National Road Schemes*", the British Standard 5228: Part 1 "*Code of practice for Noise Control on Construction and Open Sites*" and the CIRIA 2015 "*Environmental Good Practice on Site*";
- Care would be taken when unloading vehicles to minimise noise disturbance. Materials should be lowered, not dropped, insofar as practicable and safe;
- Regular visual inspections will be undertaken around the proposed site boundary and local road network to monitor the effectiveness of dust control measures;
- Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary. A road sweeper will be used where required;
- The proposed development will also implement additional noise, dust and air quality mitigation measures stated within Chapters 8 and 9;
- Water misting plant, such as bowsers and sprays will be used as required and where necessary;
- Wheel-wash facilities will be provided for vehicles exiting the site to reduce the level of dust travelling offsite;
- Where practicable, stockpiles of excavated soils and exposed surfaces will be dampened down via misting plant.
- Noise, dust and air quality will continue to be monitored throughout the duration of the proposed development.

5.8.3 Enhancement Measures for Restoration Phase

Once the quarry has been exhausted, it is proposed that it will be returned to a natural habitat.

Depending on the habitats, it could become suitable for varied species. The following recommendations can be incorporated into the restoration phase to increase the biodiversity value of the area.

- Any proposed infill will be sourced from a certified supplier for the presence of invasive species;
- All buildings, internal roads and paved areas should be removed where possible as per the Quarries and Ancillary Activities Guidelines for Planning Authorities (2004).
- The planting of additional liner features such as treelines and hedgerows for foraging birds/bats and commuting wildlife;
- Where possible, only native species of local provenance will be planted or non-native non-invasive species.
- Allowing some areas of scrub (eg. Bramble) to become established would provide groundcover for mammals and can be used as a food source for mammals/birds in the winter.
- The creation of wildflower areas or unmanaged areas of tall vegetation to increase pollinators within the area as per the All-Ireland Pollinator Plan 2021-2025.
- Installation of bat and bird boxes to encourage species enrichment and diversity.
- Creating artificial lakes or wetlands would offer new opportunities for amphibians, invertebrates and avifauna.

- A Restoration Plan will be agreed upon by the client and the County Council for the restoration of the site towards the end of life stage. This plan will be implemented once the quarry has been exhausted and all works have ceased onsite.

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5.9 Predicted Impacts with Mitigation

The following table provides a summary of the residual effects the proposed development may have, once recommended mitigation measures are implemented. It is not envisaged that there would be any considerable adverse impacts upon water quality or biodiversity due to the proposed development.

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Table 5.18: Summary of Residual Impacts Post-Mitigation

IMPACT	DEVELOPMENT PHASE	SIGNIFICANCE	MITIGATION MEASURES	RESIDUAL SIGNIFICANCE	RESIDUAL IMPACT TYPE
Habitat Loss	Operational	Not significant	• Retain some unmanaged areas and maintenance of proposed tree/hedgerow planting.	Not significant	Positive
Spread of Invasive Flora Species	Operational	Slight significance	• Regular site inspections for the spread of invasive species would be undertaken; • Should invasive species appear to be spreading, works would immediately cease until the site was appropriately treated and under control.	Not significant	Neutral
Fauna Disturbance	Operational	Slight significance	• Where possible, no construction works would be conducted outside of normal working hours • All plant machinery and equipment would be maintained in good working order and regularly inspected • Where possible, vehicles would be equipped with mufflers to suppress noise • As a minimum, the construction work contractor would comply with all legislative provisions relating to hedgerow / tree removal • Should a protected fauna species be found during the construction phase, the NPWS would be notified prior to the resumption of construction works	Slight significance	Minor Neutral
Fauna Mortality	Operational	Moderate significance	• As a minimum, the construction work contractor would comply with all legislative provisions relating to hedgerow / tree removal • No Hedgerows/trees will be removed however if required then hedgerow / tree removal works should not be carried out during the bird nesting season (1st March to 31st August), the sections / trees for removal would be inspected by an ecologist for the presence of breeding birds. Where nests are present,	Slight significance	Minor Negative

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IMPACT	DEVELOPMENT PHASE	SIGNIFICANCE	MITIGATION MEASURES	RESIDUAL SIGNIFICANCE	RESIDUAL IMPACT TYPE
			a decision would be made as to whether a licence is required from the NPWS, or whether a suitable buffer zone could be established around the active nest with removal works rescheduled until chicks have fledged. • If any bird that utilises quarries for nesting is found actively using the site, then measures must be taken to prevent directly disturbing this species while they are actively nesting.		
Bats – Disturbance / Severance of Habitat	Operational	Moderate significance	• No mature trees with bat roosting potential will be removed as part of the operational phase. • Measures would be implemented to reduce the potential for light pollution • Operational works in the hours of darkness would be kept to a minimum during the active bat season. • Lighting design measures would be implemented to reduce the potential for light pollution	Not significant	Neutral
Surface Water Quality Deterioration	Operational	Moderate significance	• Standard operational control measures for the protection of surface waters would be implemented. • Continued monitoring of the discharge for compliance with water quality parameters. • Appropriate storage and handling of fuels and oils. • Any chemicals or fuels onsite will be stored within a bunded area. • Provision of spill kits will be readily available if required. • Re-fuelling will only be undertake on the re-fuelling pad.	Not significant	Neutral
Designated Sites	Operational	Moderate significance	• Standard operational control measures for the protection of surface waters would be implemented	Not significant	Neutral

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IMPACT	DEVELOPMENT PHASE	SIGNIFICANCE	MITIGATION MEASURES	RESIDUAL SIGNIFICANCE	RESIDUAL IMPACT TYPE
			• Appropriate storage and handling of fuels and oils • Provision of spill kits		

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5.10 Difficulties Encountered in Compiling Information

Survey limitations are discussed in detail in Section 5.3. No other difficulties were encountered in compiling this chapter.

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Appendices

The Appendices for this chapter are contained in Appendix F

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CHAPTER 6

LAND, SOILS & GEOLOGY

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Kilchreest Quarry Expansion EIAR – Chapter 6 Land/Soils (Geology)

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[Kilchreest Quarry Expansion,
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Appendices

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Contained in Appendix G

Appendix 6.1 – IGI EIS Guidelines Tables

Appendix 6.2 – Tailte Eireann Site Location, Historic Maps and Old Aerial Photos,

Appendix 6.3 – GSI Contour & Karst Features and EPA Surface Water Features Mapping,

Appendix 6.4 – Soil Mapping, (Ireland Soil Map, GSI Quaternary Map, Teagasc/Cranfield Soil Maps),

Appendix 6.5 – GSI Mapping, (Bedrock, Karst, Rock Units, Aquifer, Slope Risk, Aggregate Potential),

Appendix 6.6 – Roger Goodhue Kilchreest Quarry Aggregate Assessment Letter Report,

Appendix 6.7 – VCL Site Walkover Photos of Site Area,

Appendix 6.8 – Kilchreest Quarry Limestone Aggregate Laboratory Test Results

6. LAND, SOILS (GEOLOGY)

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Introduction

Viridus Consulting Ltd., (VCL) were appointed by Collins Boyd Engineering (CBE) to complete this chapter of the Kilchreest Quarry Expansion Environmental Impact Assessment Report (EIAR) to assess the potential significant effects of the proposed development on the Land and Soils (Geology) attributes of the project.

It should be read in conjunction with Chapter 1 (Introduction), Chapter 2 (Proposed Development), Chapter 5 (Biodiversity), Chapter 7 (Water) and Chapter 15 (Interactions Summary) of the EIAR.

Expertise & Qualifications

This chapter of the EIAR has been prepared by Mr. Darragh Musgrave, a senior Geo-Environmental Consultant with VCL. Darragh holds an honours degree in Earth Science/Geology from the National University of Ireland Galway (1992) and a Diploma in Environmental Protection from the Atlantic Technological University Sligo, (2006). He has over 30 years of experience working in the geological, geo-technical, contaminated land, and soil/surface water/groundwater environmental assessment sector as a Geo-Environmental Scientist and been involved over the last few years in the preparation of a number of EIARs including the following related to large scale quarry and commercial projects:

- Rooskagh Quarry, Athlone, New Quarry Development EIAR – for Mr. E. Harney (2021/2023),
- Ardcahan Quarry, Cork, Remedial EIAR & Expansion EIAR, - Murry Bros (2018 & 2022),
- O'Regan's Quarry, Co. Cork & Harringtons Carrowscoltia Quarry, Co. Mayo, Env Assessments,
- Bellacorrick Hydrogen Plant, Co. Mayo, Development EIAR, Quarry Consulting Ireland (2022),
- Ballinglanna, Lake View and Dunkettle Residential Development EIARs – O'Flynn Group,
- Maryborough Ridge, Cork & The Paddocks, Waterford, Residential EIARs – Glenveagh Homes

Appendices

The appendices for this chapter are contained in Appendix G.

Proposed Development

The development relates to the expansion of the existing limestone quarry at Kilchreest, near Loughrea in Co. Galway. A detailed description of the proposed development and the EIAR

site boundary is presented in Chapters 1 - Introduction, and Chapter 2 – Project Description, of this EIAR.

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It is proposed to extract about 120,000 tonnes of limestone aggregate in five phases from a 7.5 hectare area over a period of about 23 years. Aspects of the proposed quarry expansion relevant to this chapter relate to the land take, soil and bedrock type, ground conditions, stability and karst risk, proposed quarry levels, potential rock volumes, suitability for quarrying and the potential effects of the land/soil and geology attributes on the proposed development.

Activities Associated with the Proposed Development

As per Step 4 of the Institute of Geologists of Ireland (IGI) Guidelines, a range of Generic Activities that can potentially interact and effect with the geological/hydrogeological environment are presented in the Activities/Environment Matrix identified as Figure 2 of the IGI Guidelines. A copy of this Matrix is presented in Appendix.6.1.

The activity associated with the proposed Kilchreest Quarry Expansion development relates to:

EARTHWORKS AND EXCAVATION OF MATERIALS ABOVE THE WATER TABLE.

This activity will be completed in a Type A (passive) geological environment.

As recommended by the IGI Activities/Environments Matrix site specific information is available to enable an assessment of the nature and depth of soil/subsoils over the bedrock around the site and the characterisation of the limestone resource in the proposed quarry expansion area.

It is proposed to complete the earthworks and construction of the boundary berms as part of the initial site development prior to rock excavations and quarrying expanding into the adjacent area. This will enable an orderly and structured site development. Refer to the site development, rock extraction and land rehabilitation phases described in Chapter 2.

Site Development Phase Activities

In order to enable the quarry to expand into the adjacent 7.5Ha area to the south and west of the existing quarry some site preparation will be required. The initial work will involve the removal of the natural topsoil and subsoil in order to expose the underlying limestone bedrock in the proposed expansion area.

It is envisaged that all the removed top soil and subsoils will be re-used on-site in the construction of boundary berms that will provide a raised physical barrier around the site. These will be vegetated to provide a visual screen around the quarry as well as assisting with the mitigation of potential noise and dust that may be generated by the quarry works. Surplus soils will be stored on site for re-use.

The existing site access road, office, toilets, weigh bridge, parking, machinery and other infrastructure used for the operating quarry will be used for the expansion area so no new site development phase works are envisaged for the expansion at this stage.

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Operational Activities

Operational phase activities will involve the extraction of limestone bedrock from the expanded quarry area. Rock blasting, breaking, crushing, stockpiling and aggregate removal off site will all form part of the operational activities of the site which will be done in an orderly manner over five phases.

The existing site access road and weigh bridge will be used for the expansion but the existing prefabricated office toilets and canteen will be removed from site and replaced with a permanent building.

Site Restoration Activities

Post quarrying it is envisaged that all buildings, plant, equipment and infrastructure will be removed off-site and hardcore, tarmac and concrete surfaces will be ripped to a depth of 30cm.

Flat surfaces such as the quarry floor, roads and work areas will be covered with subsoil with a topsoil cover to promote the regrowth of local flora. Surface water ponds will be retained to enhance the potential bio-diversity of the site.

Methodology

The EIAR Soil/Land (Geology) assessment methodology involved the completion of a Desk Study and site walkover observational survey of the study area which included the collation and review of available information pertaining to the study area, including any relevant land use or geological data, including the following:

- Planning Application for a quarry development at Isertkelly North, (EIA 2005),
- Isertkelly North Kilcreest Quarry Expansion Description, Collins Boyd Eng, (Nov'24),
- Tailte Éireann, On-line Maps and Aerial Photographs, (www.geohive.ie),
- Geological Survey of Ireland (GSI) On-line Geological Datasets, (www.gsi.ie/mapping.htm),
- Teagasc/Cranfield Soil Mapping On-line Data sets, (www.teagasc.ie/soils),
- Environmental Protection Agency (EPA) web based mapping, (www.epa.ie),
- "Geology of Galway Bay Sheet 14" 1:100,000 Scale Geology Map & Booklet (GSI 2004),
- Fastnet Analytical Ltd., Kilchreest Quarry 20th Feb 2020 Site Visit Report, (30th July 2023),
- Kilchreest Quarry Rock Quality Lab Analysis for various parameters, (2024).

The Site Walkover recognisance survey by VCL on October 31st enabled the physical examination of the geological, geomorphological and land use characteristics of the site and its setting in the locality.

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In this chapter the existing baseline conditions and character of the land, soil and geological characteristics of the site are presented and the potential effects anticipated from the development are identified and discussed. Mitigation measures are proposed, residual effects are assessed, and any relevant monitoring options are considered.

Relevant Legislation & Guidance

The Land and Soils (Geology) Chapter for the EIAR follows the guidelines outlined by the EPA guidance document, Guidelines on the information to be contained within an EIAR from May 2022, in Directive 2014/52/EU and Annex IV amendments, as well as the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018.

The work also is cognisant of the previous EPA Draft EIAR Guidelines (2017) and the Environmental Impact Statement (EIS), EPA Draft guidelines, from September 2015, which outline the process of preparation and the content required for an EIS.

The assessment work also follows the Institute of Geologists of Ireland (IGI) Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of EISs, (IGI April 2013), and National Roads Authority (NRA) Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology & Hydrogeology for National Road Schemes, (NRA 2008).

Site Surveys

As well as a topographical survey, site layout plans and cross sections were available from the design team for the assessment. Evidence from the existing quarry and adjacent land area indicate that there is a very shallow (<1m) soil profile over the bedrock in the locality. Site specific laboratory testing was available for the limestone bedrock from the existing quarry.

A senior scientist from VCL completed an observational walkover of the site on Thursday 31st October.

Potential Effect Assessment Methodology

The EPA 2022 Guidance (Section 3.7) requires the EIAR to focus on the effects that are both likely and significant and the description of effects that are accurate and credible.

An analysis of the predicted effects of the proposed Development on the land and soils/geology for the development and operational phases is presented below. (This been completed as per the EPA Guidance notes (2022 & 2015) and Appendix C of the IGI EIS Preparation Guidelines (IGI 2013).

The rating of the potential magnitude and significance of impacts/effects at EIAR stage are defined by the NRA guidance (2008), which includes typical examples, as outlined in Table 6.1.

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MAGNITUDE	CRITERIA	TYPICAL EXAMPLE
Large Adverse	Results in loss of attribute and/or quality and integrity of attribute	**Irreversible loss of high proportion of local high fertility soils** **Removal of entirety of geological heritage feature** **Requirement to excavate and replace a high proportion of peat, organic soils and/or soft mineral soils**
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	**Irreversible loss of moderate proportion of local high fertility soils** **Removal of part of geological heritage feature** **Requirement to excavate and replace a moderate proportion of peat, organic soils and/or soft mineral soils**
Small Adverse	Results in minor impact on integrity or attribute or loss of small part of attribute	**Irreversible loss of small proportion of local high fertility soils and/or high proportion of local low fertility soils.** **Removal of small part of geological heritage feature** **Requirement to excavate and replace a small proportion of peat, organic soils and/or soft mineral soils**
Negligible	**Results in an impact on attribute but insignificant magnitude to affect either use or integrity**	**No measurable changes in attributes.**

Table 6-1: Criteria for rating land/soil impact magnitude at EIS stage, (NRA Guidance Box 5.1).

Cumulative Impact

Directive 2014/52/EU requires that the EIAR examine the interaction between all the differing existing and/or approved projects in the same areas as the proposed project. Only one other development has been identified in the locality which could have a cumulative effect on the Kilchreest development.

- The existing Roadstone Quarry is located in the lands immediately to the north of the Kilchreest Quarry. At the time of the VCL site visit the Roadstone Quarry had been fully closed for a couple of months and it wasn't clear if it was going to re-open. No planning applications are currently in the planning system that would expand the Road Stone operation.
-

Difficulties Encountered

No difficulties were encountered in the completion of this chapter of the EIAR.

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Baseline Environment

The following provides a description of the receiving environment with a focus on the Land/Soils (Geology) attributes.

Site Location, Setting and History

The existing Kilchreest Quarry is located in rural setting in a relatively flat to undulating agricultural landscape about 10 kilometres to the southwest of Loughrea town in Co. Galway.

The existing quarry is accessed via a short internal road coming off the north side of the local L4219 road which connects to the regional R380 Loughrea to Gort road at the 'Fishpond Crossroads' about 3km to the east of the site. There are about 15 detached one-off old and new residences and farmsteads located within about 500m of the site along the local road in ribbon development pattern to the south-west, south and south-east of the site. The nearest residential houses are about 250m to the south of the site boundary. The nearest house is within the landownership of the applicant and is currentl unoccupied. There are earthen berms around the existing quarry boundary.

The history of the site is one of agricultural use and the general field pattern evident today is seen on the old OSI 1840's 6" and early 1900's 25" maps. The historic aerial photographs for the site indicate agricultural land use until the development of the Roadstone Quarry in the early 2000's and the commencement of work on the Kilchreest Quarry around 2006.

Refer to the site location, old maps and aerial photographs of the locality presented in Appendix 6.2.

Land Use and Topography

The proposed application site extends to 12.66 hectares that are currently comprised of a number of open fields divided by stone walls with some sections of mature hedge row. There is one small area of woodland-scrub in the southwestern corner of the proposed site area.

The depth of subsoil in the locality is very thin (<1m) and there are areas of exposed limestone bedrock in the land area immediately to the west of the existing quarry.

The existing, but currently closed, Roadstone Quarry occupies the lands to the north while open improved agricultural grassland borders the site boundary on all the other sides of the proposed expansion area. The local fields were being used for cattle, sheep and horses during the site walkover.

The study area is situated on relatively flat to undulating topography and occupies slightly raised broad ridge of ground with elevations ranging from about 59m OD to 69m OD. The

local fields slope gently southwards, westwards and north-westwards away from the site area. See the Contour Map in Appendix 6.3.

There is a local low lying area or hollow located just to the west of the Roadstone Quarry and north of the proposed expansion area. This topographical feature is identified as a karstic enclosed depression on the GSI maps. The area of woodland-scrub in the southwestern corner of the site is also shown to be occupied by a similar karstic enclosed depression feature. See the Contour Map in Appendix 6.3.

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There are no drainage features, such as streams, drains or ditches identified in the site or local area. The nearest watercourse is identified by the EPA mapping to be the Kilchreest Stream which is about 1.4km to the SE of the site boundary at its nearest point. See the Surface Water map in Appendix 6.3.

Soils and Subsoils

Topsoils and Subsoils (Quaternary sediments) in Ireland were deposited during or after the last ice age that effected this part of Ireland, which reportedly occurred over 100,000 years ago, and essentially comprise the compacted but unconsolidated natural mixes of clay, silt and sand with gravel and cobble stone materials overlying the bedrock.

Subsoils in Ireland are dominated by natural glacial tills with more segregated outwash deposits of sands and gravels, deposits of peat, river alluvial and coastal sediments occurring in particular environmental settings. Maps of the local area Sediment, Quaternary and Soil Association deposits are presented in Appendix 6.4.

The old An Foras Talúntais soils map of the General Soil Map of Ireland, (1980), indicates that this part of Galway is defined by Flat to Undulating Lowland Physiography (Mainly dry Mineral Soils) and the whole locality is underlain by very common principle soil of Shallow Brown Earths and Rendzinas* with associated grey brown podzolics, gleys and peat with parent material of Limestone Til which is shallow in places. *(humus-rich shallow soils that are usually formed from carbonate rich parent material.)

The GSI Quaternary Sediment Type mapping identify the locality as having Till derived from limestones (TLs) and also Karstified bedrock outcrop or subcrop, (KaRck). This is a very common sediment type. The GSI/Teagasc Soils identify the site as having Limestone Till with Parent Material as ‘Till derived chiefly from limestone’ and a Soil Group of Grey Brown Podzolics Brown Earths, (BminDW). More recent (2013) mapping presented in the online EPA/Teagasc/Cranfield Database identify that the Soil Association is called Faoldroim (1150FO) and is described as “fine loamy drift with limestones”. This soil association is widespread and a map of its local extent is included in Appendix 6.4.

Bedrock Geology

The whole study area of the proposed Kilchreest Quarry Expansion development is identified, by the on-line GSI mapping and the regional GSI 1:100,000 scale Geology of Galway Bay Bedrock Map (GSI Sheet 14 - 2004), as being underlain by the Carboniferous Dinantian aged limestones of the Newtown Member of the Tubber Formation. Refer to the GSI Geology Maps presented in Appendix 6.5.

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The Newtown Member (TUnt) is described by the GSI as a 25m thick cherty limestone with calcisltites, micrites and fine-grained argillaceous calcarenites, burrowed at some levels, with a (sporadic) microfauna or brachiopods, crinoid ossicles, corals and gastropods. The Tubber Formation (TU), which is identified by the GSI mapping to be present from the northern site boundary and therefore makes up the limestones of the adjacent Roadstone Quarry, is described by the GSI as a medium-grey, crinoidal calcarenites with shaly partings at some levels and several cherty horizons.

The Kilchreest Quarry report by Dr. R. Goodhue of Fastnet Analytical Ltd., (FAL), notes that "the deepening of the quarry and the open anticlinal fold in the area may have brought extraction into the Tubber Formation." The rock in the quarry is noted to be relatively thinly bedded, with limestone beds typically 30cm to 150cm thick and almost flat with a slight dip (1-2^{o}) noted to the South-Southeast.

The bedrock is used to produce a range of limestone aggregate products which are described in the FAL Report as being "of high quality and without any apparent concentration of problematic mineral in relation to S.R. 21:2024+A1-2016." The FAL Report (dated July 2023), is included in Appendix 6.6.

Some stock piles of prepared aggregate were present on the site during the VCL walkover and photos the quarry, stone material and open fields that occupy the study area are included in Appendix 6.7.

The existing quarry produces a range of aggregate materials which are suitable for a range of engineering uses. The rock has very good quality attributes including high calcite, low sulphur, low mudrock content, good abrasiveness low water absorption and low pyrite risk. The excavated rock material is periodically tested for a range of rock quality parameters and a recent set of laboroatry results and reports for an aggregate assessment Are included in Appendix 6.8.

Aquifer Classification

The GSI classify the aquifer potential of an area primarily based on the bedrock type. The various Carboniferous Dinantian aged limestone formations present under the site and in the general locality are classified as a Regionally Important Karstic Conduit Aquifer, (Rkc). The associated aquifer rock unit is identified as the Dinantian Pure Bedded Limestones (DPBL). Refer to the GSI Map in Appendix 6.5.

Groundwater Vulnerability

The groundwater vulnerability of a site is the term used to describe the ease with which the groundwater in the area can be contaminated by human activities. The vulnerability is determined by many factors including the speed at which the contamination can enter the aquifer, the quantity of contaminants and the capacity of the deposits overlying the bedrock to attenuate contaminants.

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These factors in turn are based on the type, thickness and permeability of the subsoils, e.g. groundwater in bedrock which has a thick cover of low permeability clay is less vulnerable than the groundwater in bedrock which is exposed at the surface.

The GSI Vulnerability On-Line Mapping indicates that the site and local area has an Extreme (E) to High (H) Vulnerability rating with thin soils (<1m deep) and bedrock interpreted to be at or close to the ground surface. Refer to the GSI Vulnerability Map included in Appendix 6.5.

The groundwater (hydrogeology) assessment of the site is included in the Water Chapter (Chapter 7).

Soft or Unstable Ground and Geohazards

There are a number of karst features, in the form of enclosed depressions or springs, identified in the local limestone bedrock just to the north of and in the SW corner of the proposed development area.

The implications for the quarry expansion would be the potential for poor quality rock to be encountered in these areas as karst features can indicate the weathering of the underling bedrock. Neither of these features are proposed to be quarried as part of the future site development as they are either outside or on the periphery of the site and would be maintained as part of the buffer zone around the extraction area. Refer to the GSI karst features map included in Appendices 6.3 and 6.6.

There is no evidence that potentially soft or unstable materials such as peat, lacustrine clays or alluvial sand/gravel deposits are present in any part of the proposed development area. Gravel deposits are identified by the GSI mapping over 500m to the south of the study area. As previously descried in Section 6.6.3 areas of thin limestone tills with ‘rock close’ are identified in the locality of the site.

The GSI has developed a database of historical landslides and landslide susceptibility in Ireland. This database indicates that no recorded landslide events lie within or in the general locality of the study area. The sites proposed development area is shown to have a low landslide susceptibility as might be expected given the level topography. Refer to the GSI Landslide Susceptibility Map in Appendix 6.5.

Note that this landslide susceptibility does not relate to potential rock falls or quarry wall collapses that could occur during the operational phase of the quarry and ongoing

management of the quarry high walls will be required as the rock excavations deepen in order to reduce the risk of rock falls.

The EPA identify that the locality is in a High Radon Area. Radon is a naturally occurring radioactive gas coming from the soil/geology and which can cause ill health if there is long exposure. New buildings will be constructed to current building regulations and will include radon barriers and sumps.

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Legacy Landfills and Contaminated Sites

In 1996 the Environmental Protection Agency (EPA) began licensing certain activities in the waste sector. These include landfills, transfer stations, hazardous waste disposal and other significant waste disposal and recovery activities. It has been determined, from the EPA website, that there are no waste licensed facilities in the study area or within the general locality (>5km) around the site.

Information from EPA on-line mapping also indicates that there are no 'Legacy Landfills' or contaminated sites situated within the study area or in the general locality (>5km) of the site.

There are no reports of foreign soil material being imported to the site or physical evidence of any backfilling activities in the existing quarry or proposed lands. No evidence of imported soils or other materials was observed during the walkover and the potential for foreign wastes to be present on the site is considered to be extremely low.

EPA Industrial Emission (IE) Licence Facilities

The EPA has been licensing certain large-scale industrial and agriculture activities since 1994 and since 2003 this had been done under the Integrated Pollution Prevention Control (IPPC) Directive and more recently the Industrial Emission (IE) Licencing system.

A review of the EPA On-line mapping resource shows that there are no EPA licensed facilities within 10km of the study area. The nearest licensed industries are in Tynah, Athenry, Gort and Owenmore.

Geological Heritage Sites

A review of the on-line GSI web mapping there are no Geological Heritage Sites identified in the site locality. A number of heritage sites, mainly related to karst features and groundwater turloughs, are located at least 3km away to the south west of the site area. Refer to the GSI Geological Heritage Site Mapping presented in Appendix 6.5.

Economic Geology

A review of the on-line GSI web mapping indicates that there are a number of other active aggregate quarries in the general locality (within 15km) all developed on the limestone resources. Refer to the GSI quarry location mapping presented in Appendix 6.5.

The GSI identify that the area has a High to Moderate Potential for Crushed Rock Aggregate Resources. Refer to the GSI Rock Aggregate Resource Mapping presented in Appendix 6.5.

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Areas of Scientific Interest

A review of the National Park & Wildlife Service (NPWS) database has shown that there are two areas of ecological importance in the general area of the site.

The Slieve Aughty Mountains Special Protection Area (SPA) (Site Code 004168) is located in the upland area >2.5km to the southeast of the site and the Peterswell Tourlough Special Area of Conservation (SAC) is located about 3km to the south of the site.

The sites of scientific interest are discussed in more detail in the Chapter 5 – Biodiversity.

Conceptual Site Model

As per the IGI EIA Guidance recommendations a Conceptual Site Model (CSM) has been developed for the site area examining the interaction of the project with the geological environmental. The main interaction is the removal of the over lying soils and excavation of the limestone bedrock above the groundwater table.

Cross section drawings have been produced by the project engineers and these are included in Chapter 2 of the EIAR.

Type of Land and Soil/Geological Environment

As per Step 3 of the IGI Guidelines the baseline information and CSM enables the type of soil/geological and hydrogeological environment to be determined for the development.

From the range of generic environments outlined in the IGI document (Types A to E) the Kilchreest Quarry Expansion area is interpreted to have initially a:

Type A - Passive geological/hydrogeological environment.

This is based on the fact that the area is underlain by a regionally important aquifer, which is in an area with a historically stable geological environment and the fact that the site does not represent any aspect of a Type B groundwater discharge area with a regionally important aquifer.

As described in the EIAR Water assessment in Chapter 7, once the quarry expansion excavates down to the deeper bench at 25mOD the site will have some characteristics of a:

Type C - Man-Made Dynamic Hydrogeological Environment with mining or quarrying below the water table,

The Hydrogeological assessment in Chapter 7 calculates the zone of influence of groundwater drawdown around the quarry to be about 190m which is “very local” and doesn’t impact any other zones of contribution or designated European Sites. Therefore, the site development

does not represent a Type D Sensitive Geological/Hydrogeological environment with karst limestone or water supply SPAs or a Type E Groundwater Dependent Ecosystem or wet land with a river with a high base flow of groundwater.

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Criteria for Rating the Site/Attribute Importance – Geological Features

For rating the Site Importance of Geological Features the relevant guidance follows the NRA 2008 matrices, (Table C2 of the IGI Guidelines), use four importance criteria – Very High, High, Medium and Low depending on the quality of the attribute.

The site importance criteria, with the NRA examples, are applied to the Kilchreest site in Table 6.2.

ATTRIBUTE	CRITERIA	TYPICAL EXAMPLE	IMPORTANCE
Soils	Attribute has Low quality significance as moderately fertile thin soils.	Thin, moderate fertility well drained soils	**LOW – very common thin soils**
Limestone Bedrock	Attribute has a HIGH quality aggregate resource potential for a quarry.	Clean calcite rich low pyrite limestone aggregate rock which is economic for extraction	**HIGH – extractable limestone good quality crushed rock**
Geological Heritage	**Attribute has LOW quality significance or value on a county scale**	**Part of an extensive limestone unit no geological heritage designation.**	**Low – no geological heritage designation in the locality**

Table 6-2: Criteria for rating Site Importance for Soil/Geology at EIS stage.

Based on the rating of the site attributes the limestone bedrock is identified as having a High Importance as it represents an economically extractable crushed rock aggregate resource. The soil profile and geological heritage attributes are very common on a local and county wide scale, are not designated and are both considered to be of Low Importance.

The 'Do Nothing' Scenario

The 'Doing Nothing' Scenario would result in the existing quarry at the site running out of aggregate material and ultimately closing, with the associated job and revenue losses while the undeveloped land would continue to be used for agricultural pastoral grassland.

The long term local demand for crushed limestone aggregate would likely mean that other green field sites, that may not be as suitable for rock extraction, would be put forward for quarry development.

Potential Significant Effects

Development & Operational Phases

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The most significant effect of the proposed quarry expansion on the land and soils/geology attribute is the change from an agricultural to rock extraction land use with the removal of the soil cover and the excavation of the underlying limestone bedrock down to the required design level permanently sterilising the use of the land for agricultural purposes in the future.

The existing thin horizon of unconsolidated soils/subsoils, that comprise of the Glacial Limestone Tills, (Faoldroim soil association - fine loamy drift with limestones), are very common and extensive soils and no particular agricultural or geological importance or heritage value is attributed to them. The removal would be PERMANENT in areas of the site where they are removed but given the size of the proposed development area and extensive abundance of this type of soil and subsoil, it would be considered to be a SMALL ADVERSE to NEGLIGIBLE significance with a NEUTRAL quality effect.

The excavation of the underlying limestone bedrock of the Newtown Member (TUnt) and possibly Tobber Formation (TU) at depth, are not unusual geological units and no geological heritage value has been attributed to them or occurs locally. They are an economically extractable and important crushed rock aggregate resource. The extraction would be PERMANENT in the quarry area but given the extensive abundance of this type of limestone and positive economic benefit it would be considered to have a POSITIVE quality with NEGLIGIBLE significance to the attribute.

Due to the quarrying activity the ground level will be raised by the construction of a boundary berm from the excavated subsoils around the boundary of the site. The bedrock excavation will significantly lower the ground levels in the quarry itself. This will have a PERMANENT effect but one which would not be considered to alter the overall landscape character of the general area and would be considered to have a NEUTRAL quality with NEGLIGIBLE significance.

(This is discussed in more detail in the Chapter 13 - landscape and visual assessment).

There is the potential occurrence of unstable rock faces during and following quarrying. Ongoing management of the quarry walls, through ripping and geotechnical management during the operational phase will be used as necessary to mitigate this effect. No unstable rock faces will be left after the operational phase as the site restoration phase will ensure that only stable rock faces are left in-situ. Any unstable rock faces would have a BRIEF to short term TEMPORARY and NEUTRAL effect on the site with NEGLIGIBLE significance.

Activity of machinery and quarry plant equipment operating in the excavation area could result in small scale fuel or oil spills to the ground surface. This would be a potential TEMPORARY to SHORT-TERM NEGATIVE effect if a small accidental spill was to occur, but with NEGLIGIBLE significance.

Potential occurrence of dust generation from the quarrying activities, especially rock crushing, and suspended sediments in rainfall runoff from work areas would have a potential BRIEF to TEMPORARY NEGATIVE effect if left uncontrolled. The scale of the effect would have a NEGLIGIBLE significance.

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The vulnerability of the bedrock is classified as extreme to high and therefore the presence of site toilets, truck washdown and fuel storage area pose a contamination risk to the underlying regionally important aquifer. Potential contamination incidents would be generally considered to be a SHORT TERM to TEMPORARY events with a NEGATIVE effect, but with NEGLIGIBLE long term significance. The development of proper infrastructure, impermeable hard surfaces and interceptors in washdown and fuel storage areas, as well as good housekeeping will help mitigate these potential pollution risks. There is reportedly no history of contamination in the almost 20 years that the existing quarry has operated.

Cumulative Effects

There are presently no local projects in the planning process that would have a cumulative or in combination impact on the local soil and bedrock attributes. The adjacent Roadstone Quarry is currently closed and it is unknown if it will re-open.

Summary

The following Table summarises the identified likely significant effects during the development and operational phase of the proposed quarry expansion before mitigation measures are applied.

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Top-Soil Removal	Neutral	Negligible	~ 8 Ha	High	Permanent	Irreversible
Subsoil Removal	Neutral	Negligible	~ 8 Ha	High	Permanent	Irreversible
Bedrock Removal	Positive	Negligible	~ 7 Ha	High	Permanent	Irreversible
Changes to ground level	Neutral	Negligible	~ 8 Ha	High	Permanent	Irreversible
Unstable ground	Negative	Small Adverse	Very small	Low	Brief	Worse Case
Ground Contamination	Negative	Negligible	Very small	Low	Temporary	Worse Case
Sediment/Dust Generation	Negative	Negligible	Small	Moderate	Brief to Temporary	Worse Case

Table 6-3: Summary of Construction Phase Likely Significant Effects in the absence of mitigation.

Based on Table C4 of the IGI 2013 Guidelines, Assessing the Criteria for Rating Impact Significance at EIS Stage – Estimation of the Magnitude of Impact on the Geological Attributes, (after NRA 2008), would be considered to be 'Negligible' for land/soils as although there would be a loss of some of the agricultural attribute on a local scale, on a county scale the

magnitude of impact could be considered to be 'Negligible' as the attribute is of Low Importance and quarry expansion would 'result in an impact on the attribute but of insufficient magnitude to effect either use or integrity', as the soil and bedrock types are so extensive on both a County and National level.

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Based on Table C6 of the IGI Guidelines, Rating of Significant Environmental Impacts at EIS Stage (after NRA 2008), with the Importance of the land and soils/geology attribute 's 'Low' and the Magnitude of Impact as 'Negligible' then the Impacting Rating is considered to be 'Imperceptible'.

Mitigation Measures

The sensitivity and value of the receiving environment combined with the magnitude and duration of the potential impact defines the environmental significance of the effect and is examined both before and after the application of mitigation measures. Generally, the more significant and long term the impact the more difficult it is to mitigate it.

While the magnitude of the potential long term effect on the land and soil/geology from the development are considered slight to negligible there are potential brief to temporary or short term negative effects that may arise during the development/operational stages that could cause environmental risks. There are a number of mitigation measures that can be implemented that would help eliminate and/or reduce the occurrence of these potential negative environmental effects.

Incorporated Design Mitigation

The planning of the quarry expansion in terms of soil removal, buffer zone boundary distances and establishment and planting of screening berms, rock extraction/blasting sequencing, benching and road design as well as the placement of plant machinery and aggregate stockpiles will all help mitigate potential noise, dust, pollution incidents, excessive fuel use and reduce the potential environmental effects and lower the carbon foot print for the quarry expansion.

The design of the quarry expansion will seek to mitigate potential negative environmental effects with all new-build infrastructure to be designed in accordance with the Technical Guidance Documents of the Building Regulations and associated codes of practice, which require due cognisance of the receiving environment.

The quarry walls left after the rock excavation will be designed in such a way as to be self-supporting both during the operational and remediation phases of the development.

Development & Operational Phase Mitigations

- The excavation of unconsolidated soil and subsoils that is required for the quarry development will be done in a phased manner with the material used to create the boundary berms. These will be seeded and planted as soon as possible after construction to limit the potential for sediment runoff or dust generation to occur.

- Limiting access roads to only the active quarry work areas will limit the potential amount of dust or sediment runoff generated on the site by machinery movements.
- Dust can be reduced by damping down of the works areas and especially in rock crushing and trammelling areas and along roads or access tracks where vehicle activity increases the generation of dust and fine particulates.
- The designated carparking area will be maintained by the existing access. The quarry infrastructure will include the existing designated office, weigh bridge and toilet block.
- Designated stockpile areas for the temporary storage of crushed rock material will be established and clearly signed to prevent confusion or the mixing of aggregate products.
- Activity of plant equipment and machinery operating in the quarrying area could result in small scale fuel or oil spills to ground - mitigating against accidental leaks and spillages during the works will involve implementing good practices including regular plant inspections and maintenance, adequate bunding for storage containers, refuelling in designated areas, operator training, e.g. incident response training with use of spill kits, etc.
- All fuel storage areas on the site will be sufficiently bunded and any mobile bowsers used on site will be double skinned. Bunds sufficiently large to fully contain accidental spills will be provided around all tanks/storage areas containing harmful substances.
- Any truck washdown and refuelling areas will have hard standing and suitably sized interceptors to ensure dirty wash-water or fuel spills do not enter the ground or groundwater.
- Spill kit materials will be maintained on site and site staff trained in the response to accidental spills and the use of clean up materials.
- Good housekeeping (site clean-ups, use of disposal bins, etc.) around the site and proper use of storage and disposal facilities for lubricants fuels, oils and other waste streams will be used.
- All finished quarried areas will be landscaped and re-grassed as soon as possible after completion to limit the potential for dust and sediment generation from those areas.
- The site will follow relevant environmental guidelines such as the EPA 'Environmental Management in the Extractive Industry: Non-Scheduled Minerals' (2006), the CIRIA C692 Environmental Good Practice on Site (3rd ed) 2010 and Concrete Industry Federation (CIF) Good Environmental Practice Guidelines.

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Restoration Phase

Upon the cessation of the extraction operations it is proposed to restore the site to a natural habitat with the plating/seeding of native flora and retention of ponds and water features enhancing the bio-diversity opportunity for the site. This is explored in more detail in Chapter 5 – biodiversity.

Where feasible, restoration of exhausted and redundant areas will be carried out at the earliest opportunity, although it is expected that the majority of the restoration will occur after extraction operations have ceased.

While there is potential for fuel spill risk from machinery involved with the re-distribution of soil cover as part of the restoration works the decommissioning and removal of the quarry plant will ensure no long term pollution risks exist.

A final geotechnical rock face stability survey of the exposed quarry walls and roads in the excavated areas will be completed as part of the site closure and decommissioning plan. This will ensure no long term slope stability risks will remain on the site.

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Residual Impact Assessment

The potential residual impacts are those that will occur after the proposed mitigation measures have taken effect. No significant residual effects are predicted for land/soils (geology) aspects of the proposed development.

The mitigation measures described reduce the potential for any significant brief to temporary or short-term effects occurring during site development, operational or restoration phases. All identified impacts have a residual significant environmental effect rating of Imperceptible.

Summary of Post-mitigation Effects

The following Table summarises the identified likely significant residual effects during of the proposed quarry development following the application of mitigation measures.

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Effect Rating
Removal of top soil & Subsoils	Negative	Negligible	~80% of site area	High	Permanent	Imperceptible
Removal of limestone bedrock	Neutral/Positive	Negligible	~80% of site area	High	Permanent	Imperceptible
Dust/Runoff	Negative	Negligible	small	Moderate	Brief	Imperceptible
Fuel Spill	Negative	Negligible	small	Low	Brief	Imperceptible
Excavation rock face/slope failure	Negative	Negligible	small	Very Low	Brief to temporary	Imperceptible

Table 6-4: Summary of Post Mitigation Effects.

Risk of Major Accidents or Disasters

The risk of Major Accident or Disasters arising from the soil/land (geology) attributes are unlikely as the scale of the earth and rock excavation works is normal for a quarry development. While there is blasting and deep excavations proper planning and exposed rock

face design and blast management, will ensure the likelihood of a major accident or disaster occurring would be extremely unlikely.

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Worst Case Scenario

In terms of land and soils/geology the 'Worse Case Scenario' Environmental Effect would relate to the unexpected collapse of a rock face which could pose a human health risk to staff working in the quarry. It is considered that this scenario would be very unlikely once quarry faces are properly managed and descaled of loose or over hanging materials, especially after blasting events. Once properly managed any slope stability risk would be brief to temporary and would not pose a risk to site users.

There is also a human health risk from fly rock during blasting events but these are mitigated by good instillation, planning and site controls during blasting and injuries of this nature are extremely unlikely.

Another possible worse case scenario could arise due to the accidental loss of fuel from active machinery in the development or the spillage of larger volumes of hydrocarbons during the re-fueling of plant or quarry machinery. This could possibly negatively affect the shallow soil or rock quality which could, if left unmanaged, effect the water quality in the aquifer under the site and may result in groundwater becoming contaminated. Any incident is likely to be temporary to short term and such effects are unlikely once proper site management and house-keeping actions are followed and suitable containment or interceptor infrastructure is in place.

Interactions

The main interaction of the land/soil (geology) attribute is on traffic (Chapter 14) as bedrock aggregate is removed from site. Potentially there could be interactions with air quality (Chapter 8) from dust generation and/or water quality (Chapter 7) with groundwater the primary risk receptor. There is potential interaction with landscape (Chapter 13) and biodiversity (Chapter 5) with berm construction.

Monitoring

Runoff from works, stockpile and compound areas will be observed to ensure that it is not impacting surface or groundwater. Both hydrocarbons and silt runoff cause discolouration so are easy to visually monitor for their presence.

As required by the existing operating licence, dust monitoring and groundwater sampling will be completed for the expanded quarry area.

Regular visual assessment of the exposed rock faces will be undertaken, especially after blasting events, to ensure that no slope stability risks are present. Professional geotechnical assessment of the quarry faces will be completed as necessary and the professional geological review of the rock and aggregate quality will continue.

Conclusion

There are no likely Significant Land and Soils (Geology) effects associated with the proposed expansion of the Kilchreest Quarry.

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Summary of Residual Effects and Mitigations

The following Table summarises the potential residual effects mitigation measures.

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Feature		Impact Assessment of Significant Effects					
Name	**Importance**	**Magnitude of Impact**	**Criteria for Impact Assessment**	**Significance of Impact**	**Duration of Impact**	**Mitigation Measure**	**Residual Impact**
Top Soil	Low	Negligible	Removal of thin Limestone topsoil cover as quarrying progresses.	Imperceptible	Long term to Permanent	Re-use of topsoil in landscaping berms around the site and for the final quarry restoration.	Imperceptible
Soil and Subsoils.	Low	Negligible	Potential for dust and fine particles generated due to quarrying and production of aggregate materials.	Imperceptible	Temporary	Limit exposed areas & machinery routes, damping down of work areas, (especially rock crushing/ trammelling), as necessary, particularly in dry weather.	Imperceptible
Dinantian Pure Bedded Limestones	High	Negligible	Natural limestone rock valuable aggregate resource	Imperceptible	Permanent	Extraction of limestone aggregate resource on the site will provide economic benefit to locality.	Imperceptible
Regionally Important Limestone Aquifer	High	Negligible	Potential for soil/bedrock contamination due to leaks from quarry plant and machinery on site.	Imperceptible	Temporary to Short Term	Good housekeeping, fuel filling and vehicle maintenance. Spill kits and staff training. Designated wash down & fuelling areas with interceptor.	Imperceptible
Newtown & Tobber Lstn Bedrock Strata	Low	Negligible	Very common Carboniferous Limestone	Imperceptible	Permanent	Removal of small area of limestone will not impact the overall geological attributes on a local or county level.	Imperceptible

Table 6-5: Predicted Land and Soil (Geological) Impacts for the Kilchreest Quarry Expansion Works, Isertkelly North, Kilchreest, Loughrea, Co. Galway.

References and Sources

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Roger Goodhue Kilchreest Quarry Aggregate Assessment Letter Report, (July 2023).

EPA *"Guidelines on the information to be contained within an EIAR",* (EPA May 2022).

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Directive 2014/52/EU of the European Parliment and of the Council, (April 2014).

Geological Survey of Ireland National Bedrock/Aquifer/Vulnerability On-Line Maps – (www.gsi.ie).

EPA "*Advice Notes on Current Practice in the preparation of Environmental Impacts Statements*", (EPA 2015).

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CIRIA Environmental Good Practice on Site 4th Edition, (C741), (CIRIA Publications, 2015).

Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements, IGI, (April 2013).

Working at Construction & Demolition Sites; Pollution Prevention Guidelines (PPG 6), (UK EA 2012).

National Roads Authority (NRA) Environmental Impact Assessment for National Road Schemes A Practical Guide, (NRA 2008).

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The Institute of Geologists of Ireland publication on Geology in EIS: A Guide (IGI, 2002).

EPA Envision Environmental Maps – Online Data (www.epa.ie).

Tailte Eireann (previously Ordnance Survey of Ireland) On-Line Web Mapping, (www.geohive.ie).

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CHAPTER 7

HYDROLOGY AND HYDROGEOLOGY (WATER)

Document Control

Document Number 23.129-EIAR-R01

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Revision	Date	Prepared	Checked	Approved
PL0	04/11/2024	Various	TC	EC
PL1	26/02/2025	Various	TC	EC

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7. WATER

7.1 Introduction

This chapter of the EIAR consists of the appraisal of the Project (described in Chapter 2) under the heading of Water (Hydrology and Hydrogeology) within the study area of the Project.

This chapter initially sets out the methodology (Section 7.2), describes the receiving environment (Section 7.3) and summarises the main characteristics of the Project which are of relevance for hydrology and hydrogeology (Section 7.4). The evaluation of effects of the Project on hydrology are described (Section 7.5), measures are proposed to mitigate these effects (Section 7.6), residual effects are described (Section 7.7) and cumulative effect are described (Section 7.8).

7.2 Methodology

This section outlines the methodology used to prepare this chapter of the EIAR and is founded on current legislation and guidelines.

7.2.1 Regulations, Legislation and/ or Guidelines

- Environmental Protection Agency (EPA). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the EPA Guidelines) (EPA 2022)
- Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (European Commission 2017)
- Environmental Impact Assessment of National Road Schemes – A Practical Guide (NRA 2008b)
- National Roads Authority (NRA) Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (hereafter referred to as the NRA Guidelines) (NRA 2008a)
- DoEHLG (Nov 2009) Flood Risk Management and the Planning System Guidance
- Inland Fisheries Ireland (IFI) (2016) Guidelines on protection of fisheries during construction works in and adjacent to waters

Water resource management in Ireland is dealt with in the following key pieces of legislation:

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- Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy
- Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration
- European Union (Drinking Water) Regulations 2023 (S.I. No. 99/2023)
- European Communities Environmental Objectives (Groundwater) Regulations 2016 (S.I. No. 366 of 2016), as amended
- European Communities Environmental Objectives (Surface Waters) Regulations 2019 (S.I. No. 77 of 2019) as amended
- European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. No. 293/1988)
- European Union (Water Policy) (Abstractions Registration) Regulations 2018 (SI no. 261 of 2018)
- European Communities (Assessment and Management of Flood Risks) Regulations 2010 (S.I. No. 122/2010)
- The EU Floods Directive, 2007/60/EC
- Water Services Acts 2007 to 2017
- Directive 2000/60/EC Water Framework Directive (WFD)

7.2.2 Data Sources

This chapter is prepared having regard to the requirements of Section 50 Subsection (2 and 3) of the Road Act 1993 as amended, and with the following guidance:

- Environmental Protection Agency (EPA). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the EPA Guidelines) (EPA 2022)
- Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (European Commission 2017)
- Environmental Impact Assessment of National Road Schemes – A Practical Guide (NRA 2008b)
- National Roads Authority (NRA) Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (hereafter referred to as the NRA Guidelines) (NRA 2008a)
- DoEHLG (Nov 2009) Flood Risk Management and the Planning System Guidance
- Inland Fisheries Ireland (IFI) (2016) Guidelines on protection of fisheries during construction works in and adjacent to waters
- Surface Water and Drainage Guidance in the Transport Infrastructure Ireland, TII Publications Road Design Standards. DN-DNG-03063 June 2015 and DN-DNG-03065, June 2015

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Water resource management in Ireland is dealt with in the following key pieces of legislation:

- Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy
- Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration
- European Union (Drinking Water) Regulations 2023 (S.I. No. 99/2023)
- European Communities Environmental Objectives (Groundwater) Regulations 2016 (S.I. No. 366 of 2016), as amended
- European Communities Environmental Objectives (Surface Waters) Regulations 2019 (S.I. No. 77 of 2019) as amended
- European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. No. 293/1988)
- European Union (Water Policy) (Abstractions Registration) Regulations 2018 (SI no. 261 of 2018)
- European Communities (Assessment and Management of Flood Risks) Regulations 2010 (S.I. No. 122/2010)
- The EU Floods Directive, 2007/60/EC
- Water Services Acts 2007 to 2017
- Directive 2000/60/EC Water Framework Directive (WFD)

The following list of data sources were reviewed as part of this assessment:

Ordnance Survey Ireland (OSi)

- Discovery Series Mapping (1:50,000)
- Six Inch Raster Maps (1:10,560)
- Six inch and 25inch OS Vector Mapping
- Orthographic Aerial Mapping

Environmental Protection Agency (EPA)

- Teagasc Subsoil Classification Mapping
- Water Quality Monitoring Database and Reports
- Water Framework Directive Classification status and risk
- EPA Hydrometric Data System
- EPA water quality and chemistry Data System

Office of Public Works (OPW)

- Arterial Drainage scheme land benefitting Mapping for Ireland

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- OPW and Drainage District Arterial Drainage Channels and Maintained Channels
- OPW hydrometric Data website (Dec 2024)
- OPW Floodinfo.ie website (Dec 2024)
- OPW Preliminary Flood Risk Assessment Mapping (pFRA)
- OPW CFRAM Flood Risk Mapping, final hydrology, hydraulics and flood risk management reports (2016/2017)
- OPW CFRAM channel Surveys *https://www.floodinfo.ie/cross-section-survey-data/*.

Geological Survey of Ireland

- Groundwater Flood Mapping
- 100k Bedrock Geology Mapping and fault lines
- Karst data base and dye tracing connections
- Groundwater Aquifers
- Groundwater Vulnerability
- GSI Open Topographical Data Viewer https://www.gsi.ie/en-ie/events-and-news/news/Pages/Open-Topographic-Data-Viewer.aspx
- Groundwater Recharge
- Quaternary Geology mapping
- Teagasc Soils mapping
- Groundwater water level monitoring

Galway County/City Council

- Galway County Development Plan (2022 – 2028)
- Planning Register
- Water Services – Abstractions, Discharges & Supply Schemes

National Parks and Wildlife Service (NPWS)

- Designated Areas Mapping
- Site Synopsis Reports
- Conservation Objectives documents

Other sources

- Western River Basin Management Plan (2009 – 2015)
- Aerial survey photography OSI Geohive resource
- Geological Survey of Ireland (GSI) Web Mapping
- Google Aerial Mapping
- Bing Aerial Mapping

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7.2.3 Assessment Methodology

The methodology follows the general guidance outlined in Section 5.6 of the TII Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes pertaining to the treatment of hydrology and hydrogeology. The impact category, duration and nature of impact have been considered in this assessment. The range criteria for assessing the importance of hydrological features within the study area and the criteria for quantifying the magnitude of impacts are assessed in accordance with the guidelines.

The TII Guidelines (2009), provide criteria for ranking of the identified hydrological features within the assessment study area.

The rating of potential impacts from the Project on the hydrogeological environment has been assessed by:

- Classifying the importance of the relevant attributes (Table 7.1 and 7.2)
- Quantifying the likely magnitude of any impact on these attributes (Table 7.3 and 7.4)
- Determining the resultant significance (Table 7.5)

Table 7.1 Criteria for Rating Site Attributes - Estimation of Importance of Hydrology Attributes (TII, 2009)

Importance	Criteria	Typical Example
Extremely High	Attribute has a high quality or value on an international scale	River, wetland or surface water body ecosystem protected by EU legislation e.g. 'European sites' designated under the Habitats Regulations or 'Salmonid waters' designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988.
Very High	Attribute has a high quality or value on a regional or national scale	River, wetland or surface water body ecosystem protected by national legislation – NHA status Regionally important potable water source supplying >2500 homes Quality Class A (Biotic Index Q4, Q5) Flood plain protecting more than 50 residential or commercial properties from flooding Nationally important amenity site for wide range of leisure activities
High	Attribute has a high quality or value on a local scale	Salmon fishery water Locally important potable water source supplying >1000 homes Quality Class C (Biotic Index Q3 and Q2-3) Flood plain protecting between 5 and 50 residential or commercial properties from flooding Locally important amenity site for wide range of leisure activities
Medium	Attribute has a medium quality or value on a local scale	Coarse fishery Local potable water source supplying > 50homes

Importance	Criteria	Typical Example
		Flood plain protecting between 1 and 5 residential or commercial properties from flooding. Locally important amenity site
Low	Attribute has a low quality or value on a local scale	Locally important amenity site for small range of leisure activities. Local potable water source supplying <50 homes Quality Class D (Biotic Index Q2, Q1) Flood plain protecting 1 residential or commercial property from flooding Amenity site used by small numbers of local people

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Table 7.2 Criteria for Rating Site Attributes - Estimation of Importance of Hydrogeology Attributes (TII, 2009)

Importance	Criteria	Typical Example
Extremely High	Attribute has a high quality or value on an international scale	Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation e.g. SAC or SPA status
Very High	Attribute has a high quality or value on a regional or national scale	Regionally Important Aquifer with multiple wellfields Groundwater supports river, wetland or surface water body ecosystem protected by national legislation –NHA status Regionally important potable water source supplying >2500 homes Inner source protection area for regionally important water source
High	Attribute has a high quality or value on a local scale	Regionally Important Aquifer Groundwater provides large proportion of baseflow to local rivers Locally important potable water source supplying >1000 homes Outer source protection area for regionally important water source Inner source protection area for locally important water source
Medium	Attribute has a medium quality or value on a local scale	Locally Important Aquifer Potable water source supplying >50 homes Outer source protection area for locally important water source
Low	Attribute has a low quality or value on a local scale	Poor Bedrock Aquifer Potable water source supplying <50 homes

Table 7.3 Criteria for Rating Impact Significance at EIA Stage – Estimation of Magnitude of Impact on Hydrology Attributes (TII, 2009)

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Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute and/or quality and integrity of attribute	Loss or extensive change to a waterbody or water dependent habitat Increase in predicted peak flood level >100mm[1] Extensive loss of fishery Calculated risk of serious pollution incident >2% annually[2] Extensive reduction in amenity value
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Increase in predicted peak flood level >50mm[1] Partial loss of fishery Calculated risk of serious pollution incident >1% annually[2] Partial reduction in amenity value
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Increase in predicted peak flood level >10mm[1] Minor loss of fishery Calculated risk of serious pollution incident >0.5% annually[2] Slight reduction in amenity value
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	Negligible change in predicted peak flood level Calculated risk of serious pollution incident <0.5% annually[2]

[1] refer to Annex 1, Methods E and F, Annex 1 of HA216/06

[2] refer to Appendix B3 / Annex 1, Method D, Annex 1 of HA216/06

Table7.4 Criteria for Rating Impact Significance at EIA Stage – Estimation of Magnitude of Impact on Hydrogeology Attributes (TII, 2009)

Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute and/or quality and integrity of attribute	Removal of large proportion of aquifer Changes to aquifer or unsaturated zone resulting in extensive change to existing water supply springs and wells, river baseflow or ecosystems Potential high risk of pollution to groundwater from routine run-off[1] Calculated risk of serious pollution incident >2% annually[2]
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Removal of moderate proportion of aquifer Changes to aquifer or unsaturated zone resulting in moderate change to existing water supply springs and wells, river baseflow or ecosystems Potential medium risk of pollution to groundwater from routine run-off[1] Calculated risk of serious pollution incident >1% annually[2]

Magnitude of Impact	Criteria	Typical Examples
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Removal of small proportion of aquifer Changes to aquifer or unsaturated zone resulting in minor change to water supply springs and wells, river baseflow or ecosystems Potential low risk of pollution to groundwater from routine run-off[1] Calculated risk of serious pollution incident >0.5% annually[2]
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	Calculated risk of serious pollution incident very low at <0.5% annually[2]

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[1] *refer to Annex 1, Method C, Annex 1 of HA216/06*

[2] *refer to Appendix B3 / Annex 1, Method D, Annex 1 of HA216/06*

Table 7.5 Rating of Significant Environmental Impacts (TII, 2009)

Importance of Attribute	Magnitude of Impact			
	Negligible	Small Adverse	Moderate Adverse	Large Adverse
Extremely High	Imperceptible	Significant	Profound	Profound
Very High	Imperceptible	Significant/ Moderate	Profound/ Significant	Profound
High	Imperceptible	Moderate/ Slight	Significant/ Moderate	Profound/ Significant
Medium	Imperceptible	Slight	Moderate	Significant
Low	Imperceptible	Imperceptible	Slight	Slight/ Moderate

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7.3 Receiving Environment

7.3.1 Introduction

This section provides a characterisation of the receiving water environment of the Project. The hydrological environment is presented firstly in the regional context and then in more detail at the local scale area based on information obtained specifically. This is followed by hydrogeological baseline presented on the regional and local scales.

The lands within the redline boundary which are the subject of this application comprise c12.66 hectares in total area including the existing quarry and 7.5 hectares of new land to be quarried adjacent to the existing quarry works. The site is located in the townland of Isertkelly North, Kilchreest, Loughrea, Co. Galway. The ITM centroid coordinates for the site are 552016, 713116. The proposed quarry development is located wholly within the red line boundary shown in Figure7.1.

7.3.2 Quarry Development Description

Planning permission is sought by Isertkelly Ltd. for the extension of an existing quarry, together with all ancillary site works and services, in the townland of Isertkelly North townland, Kilchreest, Loughrea, Co. Galway.

The lands proposed for the extraction of limestone is accessed via a private road and enters onto a local road (L4219) which is an existing authorised quarry access. The site occupies ground with elevations ranging between 59m OD and 69m OD. The existing quarry has currently reached a bench level of 28.5m OD based on the topographical survey. The proposed excavation on lands immediately adjacent to the existing quarry (to the west) is to a final bench level of 25m OD Malin which typically represents an excavation depth of 35 to 40m below existing ground level at the proposed extension quarry area.

The proposed limestone quarry operations comprise of the stripping and storing of existing topsoil & extraction of limestone; processing (crushing and screening) to produce aggregates

for use in the manufacture of value-added products for road construction, production of concrete products and site development works. It is intended to return the extracted area to a natural habitat following completion of extraction.

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The application site relates to the site area only. Material extracted from the proposed quarry will be processed within the proposed extraction area using mobile processing plant similar to the current practice.

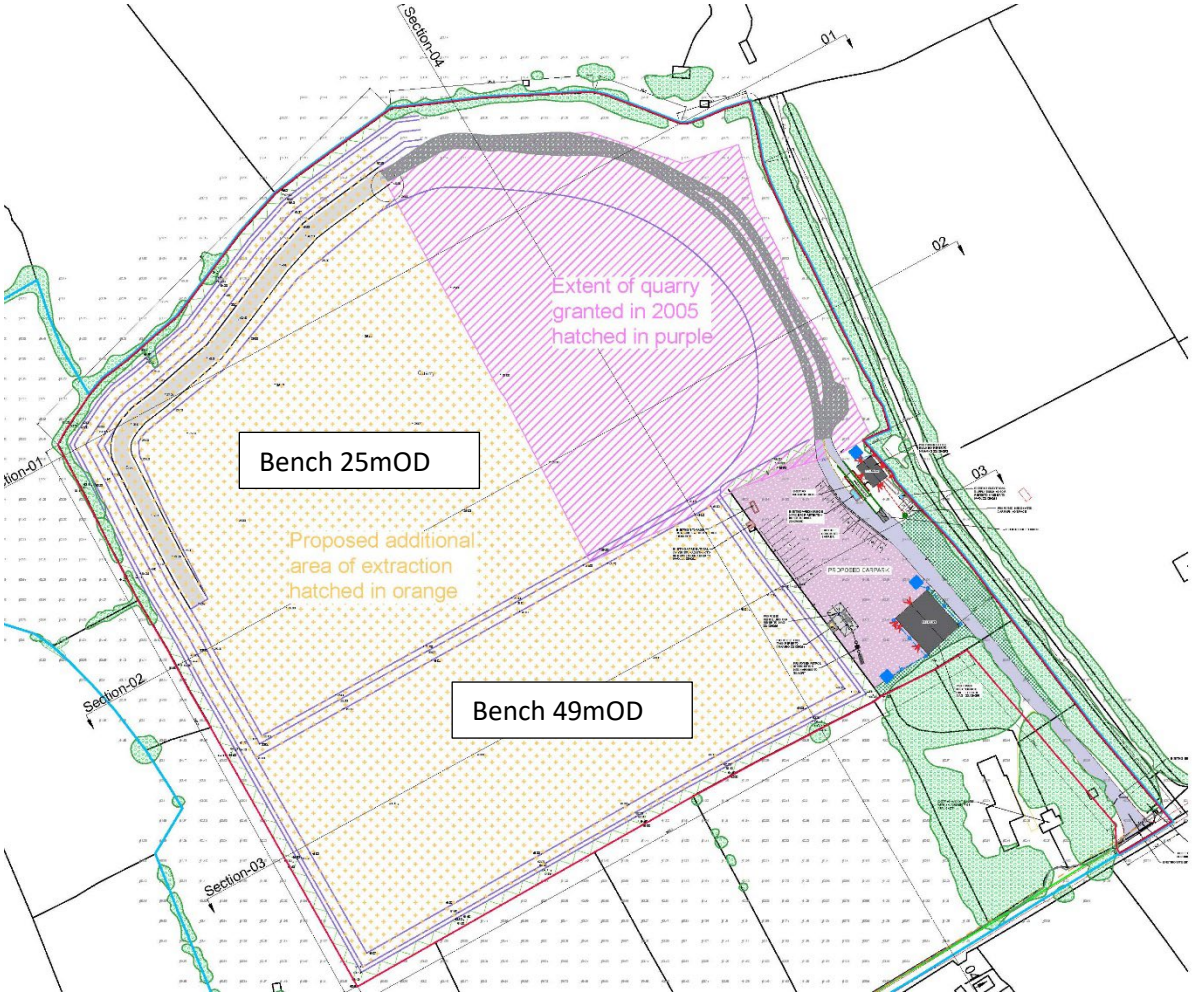

Figure 7.1 Existing and proposed limestone rock extraction areas

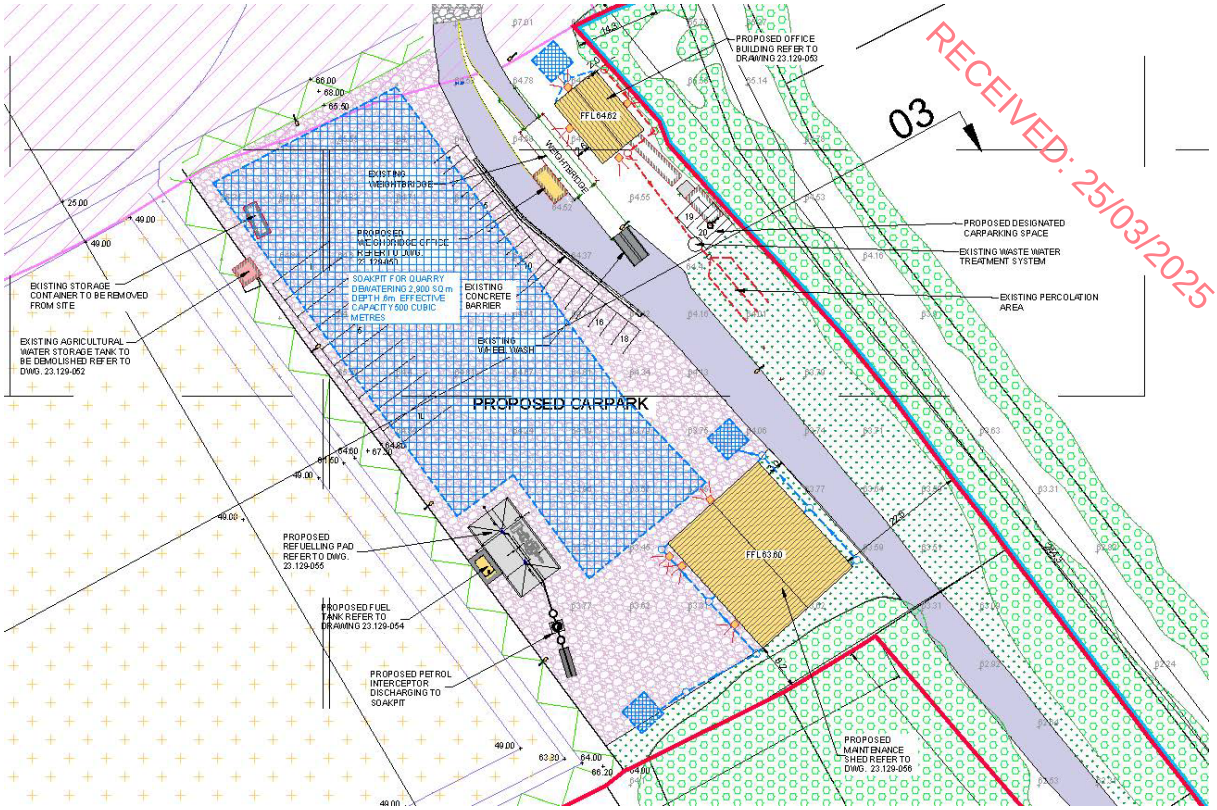

Figure 7.2 Proposed Car parking area with large soakaway, refuelling area and maintenance and site office buildings

The method of rock extraction will be by means of blasting and rock breaking. There is no set period between blasts but would typically be at least 3-4 week intervals. Mobile plant with conveyors will be used to facilitate rock crushing, screening and storage. Blasted rock will be loaded from the blasted pile laid on the quarry floor to the feed hopper of a crushing and screening plant.

To avoid dust emissions from the rock processing stages, the crushing and screening plant will be fitted with pressurised water sprays. Depending on the nature of the rock and overburden, it may be necessary to wash these materials.

On-site machinery will include:

- mobile crushing plant and screening, conveyors;
- loading shovels; and dump trucks.

The existing quarry have the following site facilities

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- a site office;
- borehole water supply
- a sewage treatment plant and percolation area; and
- a weigh bridge and wheel wash.

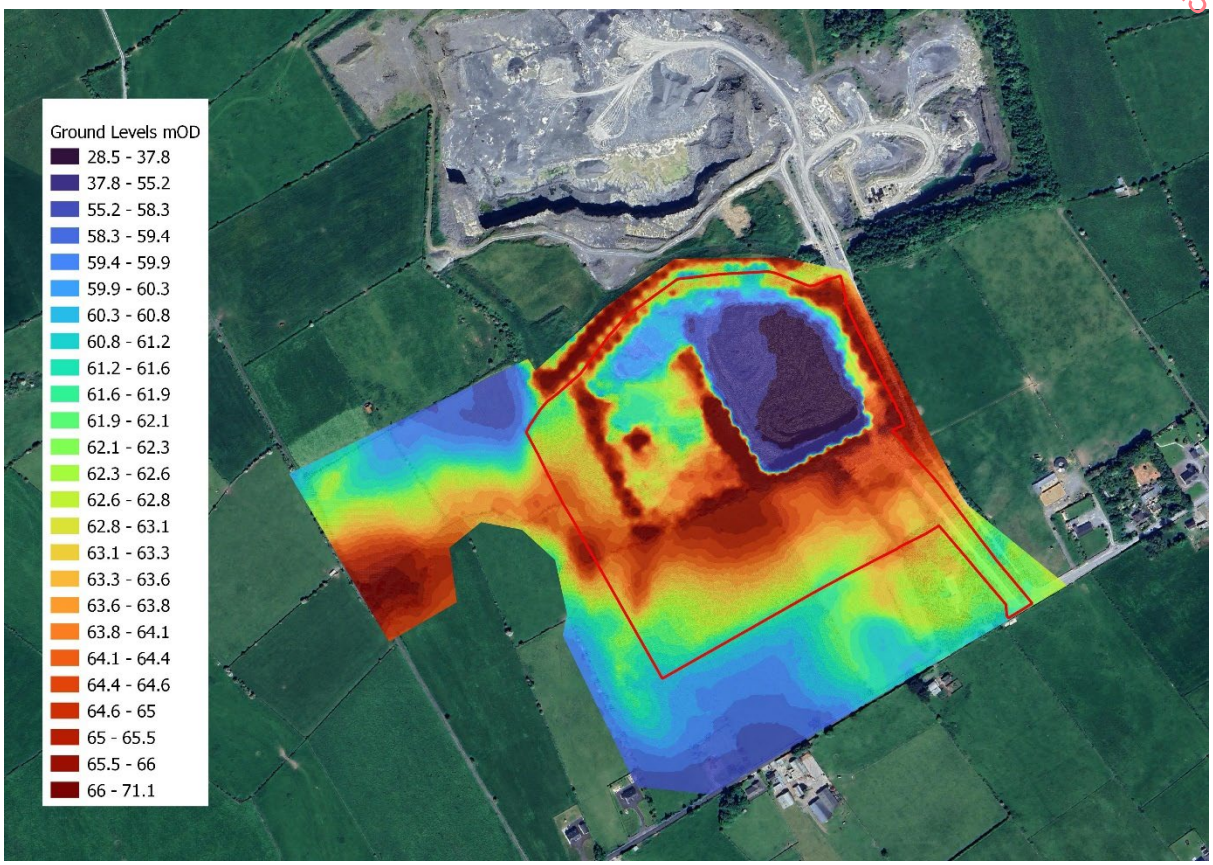

Figure 7.3 Existing ground contours at the proposed quarry site

The existing quarrying activity will remain as is and the existing site infrastructure including weigh bridge and roads will broadly remain in same location with new site office building, weigh bridge office and maintenance shed to be constructed.

The proposed overall Quarry Site area will increase to 12.66ha and the proposed extension area is 7.5 ha, which includes proposed earth berms and boundaries. The volume of stone within the proposed 7.5ha extraction area, excluding boundary earth berm areas, has been estimated to be 1.333 million m^3. At an estimated density of 1.8 tonnes/ m^3, this would equate to an estimated reserve of 2.4 million tonnes.

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The quarrying excavation operation would progress in a westerly direction from the existing quarry boundary.

Any topsoil and overburden not used for the construction of perimeter berms will be stockpiled and will be used in the restoration of the quarry in a phased basis at decommissioning.

There is to be a new bunded fuel tank located adjacent to a refuelling pad which will be connected to hydrocarbon interceptor for use in the proposed quarry operation. Fuel oil will be delivered to site via fuel truck and mobile machines will fuel atop of the impermeable fuel pad as shown on the site infrastructure drawing and the mobile crusher during its presence will be fuelled in-situ within the extraction area using a mobile bowser. All precautions such as training in the use spill kits will be in place to ensure minimal risk to the environment in the event of an accidental spillage.

A new quarry site office which will replace the existing site office and a new maintenance shed is proposed. The quarry office toilets current and proposed will discharge to the existing waste treatment plant located within the service area boundary. An assessment of on-site wastewater treatment system has been recently carried out and the report is included in appendices of this EIAR.

A designated carparking area adjacent to the site office and weight bridge which will be a gravel finish is proposed. Beneath the Carparking is a large soakaway area 2,900 m2 providing capacity of 500cubic metre for onsite management and disposal of storm drainage and when required quarry waters (dewatering of lower quarry bench during winter flood periods).

7.3.2.1 Decommissioning and Restoration works

The following will be carried out on final cessation of quarrying activities;

1. Removal of all plant and machinery.
2. Ripping up of any hardcore, macadam or concrete surfaces to a depth of 300mm,
3. Fill in with clean stone or remove any sub surface tanks,

4. Re-spreading and grading of any remaining stone/ overburden/ topsoil materials available on site.

5. The lower pats of the quarry will fill with ground water forming a pond

6. Due to the hazard of cliff faces and deep water the site will be left secure so that the general public will be unable to gain entry.

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All the work will be carried out by front loaders and excavator, including soil / stone movement and soil preparation. These works will be carried out in accordance with existing restoration plan or any future agreed restoration plan.

7.3.2 Surface Waters

7.3.2.1 Catchment Hydrology

The Quarry site is primarily located within the Kilcolgan River catchment, close to the watershed divide between the Kilcolgan (Kilcolgan_040) and the Kilchreest River (Kilchreest_010) catchments. The more southerly section of the lands within the red line boundary (5.17ha, almost 40%) naturally fall southwards towards the Kilchreest River, the remainder is within the Kilcolgan Catchment. Both rivers are within the hydrometric unit 29 Galway Bay South east.

The KIlcolgan River_040 drains westward to the R347 and then northwards discharging into the Rahasane Turlough 0.5km to the west of Craughwell Village. The Kilchreest_010 River drains southwest into the Lough Coy turlough area to the west and northwest of Peterswell where it eventually disappears underground and flows southwest and westward discharging to springs forming the Coole River and Lough Coole Turlough and other turloughs (Caherglassaun Turlough) enroute to discharging to the sea at Kinvarra Bay.

The site is locally elevated on a small limestone hill at Iniskerty North with a top elevation of 69m OD. There are no surface drains present within or adjacent to the site with all rainwater eventually infiltrating through the shallow limestone till into the limestone bedrock and groundwater aquifer. The quarry site is located right at the watershed divide

and potentially the infiltrating waters could discharge either to the Kilchreest River system (Lough Coy Turlough near Ballylee) to the southwest (part of the Lough Coole Turlough catchment) or migrate northwest via groundwater to the Kilcolgan_040 River (Rahasane Turlough).

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There are no surface water features on the site. It is expected that the high permeability of the overlying soil/sub-soils would lead to full infiltration rather than generation of surface run-off.

7.3.2.2 Flood Risk

There is no flood risk identified for the quarry site and the immediate surrounding lands. However excess rainwater can from time-to-time build-up at the base of the existing quarry, which is periodically pumped up by submersible pump to the top of the rock face where it percolates away to groundwater. This activity is only required during periods of high rainfall and for much of the year the quarry is free of water. The adjoining former Roadstone Quarry is likely during prolonged rainfall periods to have surface water ponding within the base of the quarry which is excavated down to a depth of c 30m OD. Similar to the subject quarry this water is temporary and either evaporates or percolates away to groundwater being generally free of ponded waters in the dry summer periods.

The GSI mapping identifies based of the November 2009 and the January 2016 groundwater flood risk areas throughout the south Galway and Clare karst limestone lowland areas, refer to Figure 7.4.

The nearest turlough flood areas are at Lough Kinlea at Lakyle (42m OD), 1km north which floods northwards from its lake basin and the Lough Coy / Ballylee Turlough Area, 2km to the southwest. Smaller turlough or surface ponding flood areas are identified 600m to the north at Killeen Patrick/ Lismoylan and 1km to the south at Isertkelly, both at elevations of c. 45m OD Malin.

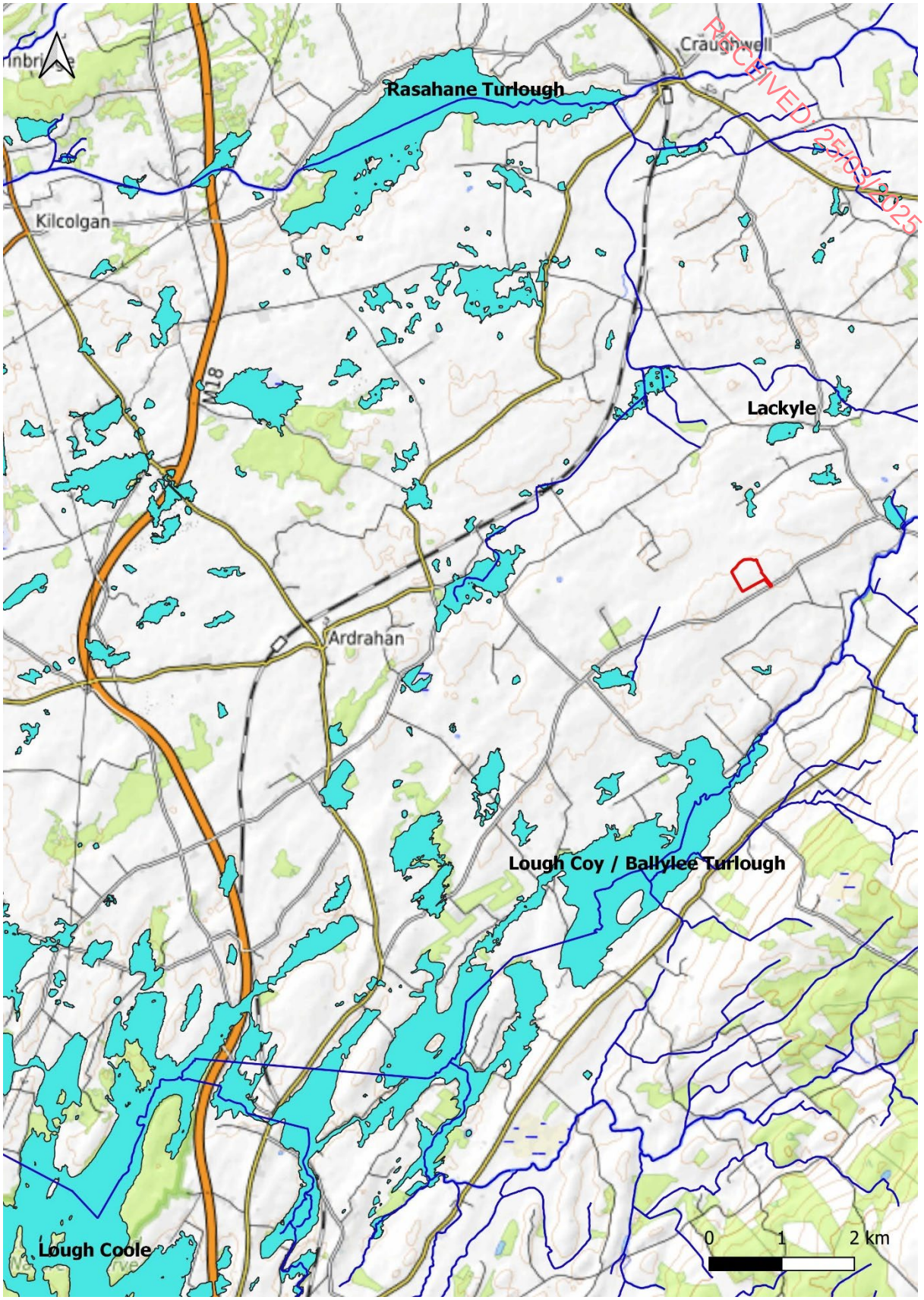

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Figure 7.4 GSI Historical Groundwater Flood mapping

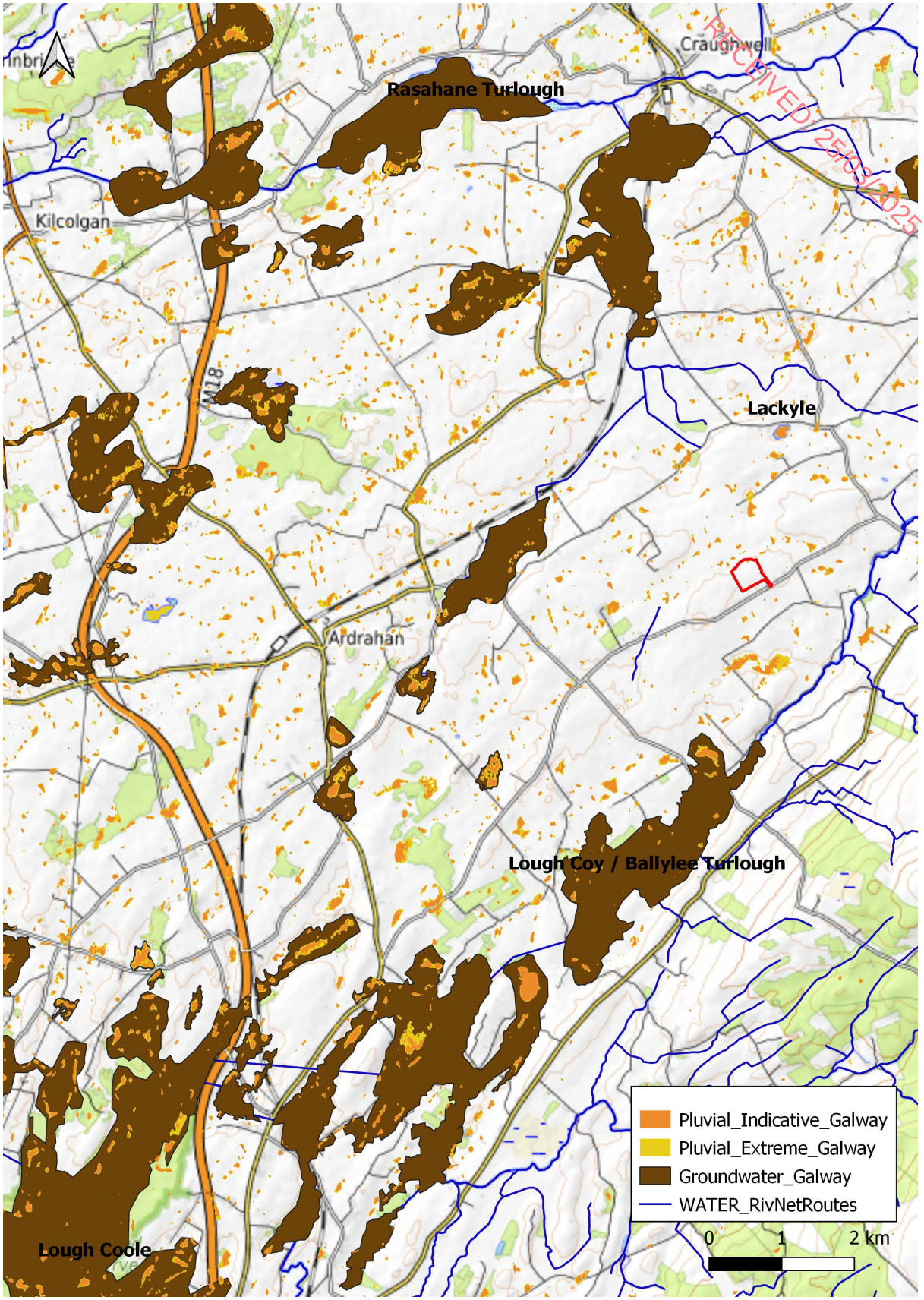

Figure 7.5 **pFRA pluvial and groundwater preliminary flood risk mapping for Galway**

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7.3.2.3 Site Drainage

The site presently drains to ground with no surface drainage features present. Some temporary ponding is present in the lower sump area of the Quarry, primarily after heavy rainfall in winter periods. This is managed through pumping up out of the quarry works area and allowed to percolate into the bedrock to the west of the quarry works area. The existing carparking area is unpaved and no surface drainage system is present with rainwater percolating through the gravel. During periods of heavy rainfall the runoff generally flows along the haul road down into the quarry sump area.

7.3.2.4 Surface Water quality and Water Framework Directive

The latest third cycle of the of the Water Framework Directive status (2016 to 2021) indicates that the Kilchreest_0100 river reach to the south is of Good Status based on modelling (low confidence). The WFD risk assessment for this river reach is under review. The Kilcolgan_040 river reach to the north is categorised for the third monitoring cycle to be of poor status, based on monitoring (medium confidence) and is at risk of not meeting the WFD objectives. Both waterbodies are considered to be of a sensitive state and under pressure from agricultural pollution.

The proposed quarry extension development will not have any direct discharge to surface waters within these catchments with all drainage water managed on site and discharged to ground and therefore well buffered from these river bodies and flood risk areas.

7.3.3 Hydrogeology

7.3.3.1 Geology

Regional geological setting: Carboniferous limestone rocks dominate the regional bedrock geology of East Galway. The regional bedrock in the area is Lower Carboniferous Limestone, described as Dinantian pure bedded limestone, overlain by a limestone till (as classified by Teagasc). The limestone comprises the Tubber Formation, which is described as a crinodal and cherty limestone and dolomite (Geology of Galway Bay, Sheet 14, 1:100,000 Geological

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Survey of Ireland, 2003). To the south is the Newtown Member of this formation, which is described as a cherty limestone. To the east the bedrock is Devonian Old Red Sandstone. The contact between Limestone and Sandstone is oriented south-west to north-east. The Limestone is generally flat lying to gently dipping to the north-west. Jointing is generally north to south. No faults are mapped in the area of the site. Refer to Figure 7.6 for the GSI Bedrock mapping in the vicinity of the site.

Local geological setting: The bedrock underlying the site is a pure compact limestone exhibiting fissuring and weathering in the upper layer. The depth to rock varies across the site but is generally shallow. The rock is overlain by limestone till which is predominantly a loose light brown to grey, clayey to silty, sand and gravel till. The gravels are sub-rounded to angular, fine to coarse, with occasional angular cobbles and boulders from various depths. Large limestone tabular boulders are present throughout the deposit.

The underlying bedrock at the site is the Newtown Member of the Tubber formation, refer to Figure 7.6. Based on the existing quarry face it is a relatively undisturbed limestone with generally horizontal bedding planes. This a medium grey, fined grained Crinoidal and Cherty Limestone and Dolomite (Packstone and Wackestone) of Dinantian age, which is approximately 25 metres thick. North of the site the bedrock is Lower Carboniferous Limestone, forming the Tubber Formation which is described as a crinodal and cherty limestone and dolomite (Geology of Galway Bay, Sheet 14, 1:100,000 Geological Survey of Ireland, 2003) and is approximately 145 metres thick.

7.3.3.2 Groundwater Aquifer

The bedrock aquifer associated with this Tubber formation is Classified as Regionally Important karst conduit flow aquifer, refer to Figure 7.7. The aquifer supports karst features and preferential conduit flow pathways, refer to Figures 7.9 and 7.10. The aquifer vulnerability is presented in Figure 7.8, and indicates high groundwater vulnerability at the site. The quarry activities on the site have increased this vulnerability to extreme, through removal of the soils and subsoils and the exposure and excavation of the bedrock.

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Based on the shallow thickness and permeability of the subsoil overlying the bedrock (less than 3 metres), the groundwater aquifer is classified as being extremely vulnerable to pollution based on at-site information on overburden type and depths. The main threat to the groundwater is agricultural runoff from farmyard wastes and land spreading, as well as from domestic septic tanks.

7.3.3.3 Karst Features

Numerous karst features are mapped in the Tubber limestone Formation to the west and south of the site (enclosed depressions, Caves, dry valley, escavelles, swallow holes and springs). Tracer surveys by GSI and Trinity College show generally a linkage between swallow hole and springs that is westward towards Kinvarra and southwest to the Coole area at Gort and northwards from Coole to Kinvarra, refer to Figure 7.10.

7.3.3.4 Water Framework Directive quality status

The Groundwater body at the stie is the Rahasane Turlough SAC Groundwater Body (60% of the site) and the southerly section (40%) is within the Lough Coy Turlough SAC GWB, refer to Figure 7.11. The Groundwater status based on the latest third cycle (2016 – 2021) is Good for both waterbodies. However both groundwater bodies have been identified to be at risk from Agricultural Pollution and the Rahasane Turlough SAC Groundwater Body also from domestic wastewater pollution.

7.3.3.5 Groundwater Supply Sources

Source Protection - Zones of Contribution

The quarry site is not located within any public groundwater supply zone of contribution (ZOC). The nearest ZOC is mapped as the Ardrahan Area 2 zone which extends to within 460m west of the site. There is an existing working old hand pump well that is located at the Quarry site road entrance on the L4219 Road (E552287,N712985).

Domestic wells

A number of the dwelling houses along the L4219 road have household and agricultural borehole supplies with borehole wells sunk deep into the Limestone Bedrock. All of the residential household and farmyard supplies in the area come from either bored wells or rainwater tanks.

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Isertkelly Group Water Scheme: This is a bored well located approximately 0.75 km to the southwest of the proposed development. The borehole was drilled by Mulcair Well Drilling towards the end of 1998, and is 76.2 metres (250 ft) deep. A 24-hour pump test was carried out at the time of drilling, and indicated a yield of 61 m^3/day (560 gal/hr), with a drawdown to 64.3 metres below ground level.

7.3.3.6 Groundwater levels

The current depth of excavation at the existing quarry is a bench level at approximately 28.5m OD Malin which is likely to be well below the regional Groundwater table levels in this area. There is no visible groundwater seepages and inflows to the quarry evident along its excavation sidewalls and management of water from the quarry base is generally associated with direct rainfall on to the excavation area only. The direct and groundwater inflow has been reported as easily managed by pumping the ponded water from the Quarry floor up on to the lands immediately to the west and allowing this water to percolate away into the bedrock. Locally the groundwater bedrock aquifer is very unproductive and therefore dewatering volumes from the quarry works are minimal.

The groundwater flooding mapping for the surrounding area indicates that groundwater Turlough levels are generally below 45m OD both to the north and south of the Quarry site.

In December 2004 for the original Quarry planning application, Mulcair Well Drilling Ltd drilled three boreholes BH1 to BH3) on the site to a depth of 91 m below ground level. A fourth borehole (BH4) had been previously drilled in July 2004 to a depth of 122 m (400 ft) below ground level. Three-day pump tests were carried out by Mulcair Well Drilling Ltd on

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BH1, BH2 and BH3 in February 2005, and a test on BH4 was carried out in July 2004 and obtained the following yields:

- BH1 1.20 m^3/day
- BH2 1.63 m^3/day
- BH3 1.92 m^3/day
- BH4 5.57 m^3/day

These pump test yields represent very low yielding wells indicating a locally poor productive bedrock aquifer at the site.

Groundwater table: The groundwater table is unconfined and located at depth within the bedrock aquifer. Water levels in four boreholes drilled on the site, and one County Council hand pump well were monitored during December to April 2005. The water table levels at the site varied from 12.43 to 32.5 m below ground level, as indicated below.

Table 7.6 Monitored Historical Groundwater levels at the Site

Watertable Elevation m OD Malin Head				
Date	BH1	BH2	BH3	BH4
05/12/04	35.84	36.40		45.75
09/12/04	35.30	37.08	51.46	
05/01/05	38.07	39.87	53.40	46.99
10/01/05	43.74	45.42	55.84	48.54
19/01/05	38.33	40.24	53.94	48.72
26/01/05	37.56	39.77	54.14	47.55
25/02/05	33.60	36.21	52.17	47.15
01/04/05	34.25	35.65	51.51	45.03

Refer to Figure 7.13 for location of these boreholes.

Historical groundwater levels were also recorded in boreholes located on the former Roadstone Quarry site to the north, and in domestic wells and boreholes in the local area. Two of the boreholes in the Roadstone Quarry had water at approximately 26 m below ground level measured on the 26th January 2005.

Present Day monitoring at the Subject Quarry Site

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As part of the on-going monitoring program for the existing quarry, Borehole BH4 is tested quarterly and the majority of the water quality results meet the relevant drinking water guideline values. However, both the faecal coliform bacteria and Escherichia Coli bacteria are generally above the recommended limit for drinking waters and the levels of phosphate detected were also above the recommended limits. The bacteriological and phosphate levels indicate faecal contamination from possibly septic tanks or agriculture. There were no trace Petroleum hydrocarbons (TPHs) detected in the sampling. BH 3 is blocked at approximately 12m and could not be accessed for testing and both BH1 and BH2 have been decommissioned. BH3 supplies water for the quarry operation and its water quality was tested on the 8th February 2025 from the site office tap, Refer to Appendix E for these results. Only arsenic and total coliforms exceed the drinking water standards. Arsenic is naturally occurring in deep groundwaters.

The water level monitoring of BH4 indicates that the existing quarry bench of 28.5m OD has not significantly impacted the water table level at this borehole located at the road entrance to the Quarry.

Table 7.7 Recent Groundwater monitoring at the Quarry

Date	BH1	BH2	BH3	BH4 M OD Malin
05/10/23	decommissioned	decommissioned	Blocked	47.683
18/01/24				37.983
17/06/24				39.883
20/09/24				45.783
08/02/25				37.360

It is reasonably to surmise that the permanent groundwater table at the proposed quarry site can be represented by a groundwater level of between 40 and 45m OD Malin.

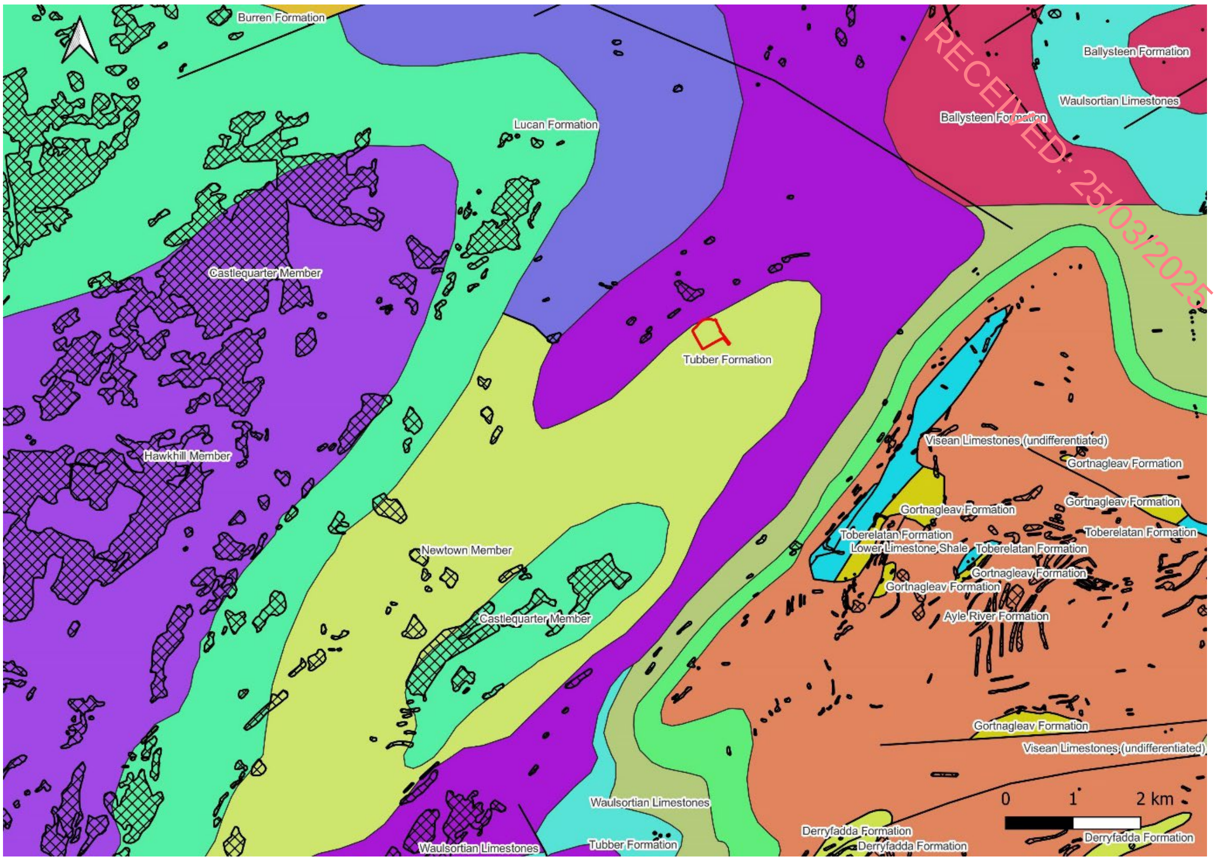

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Figure 7.6 GSI 100k Bedrock map with mapped rock outcrop areas

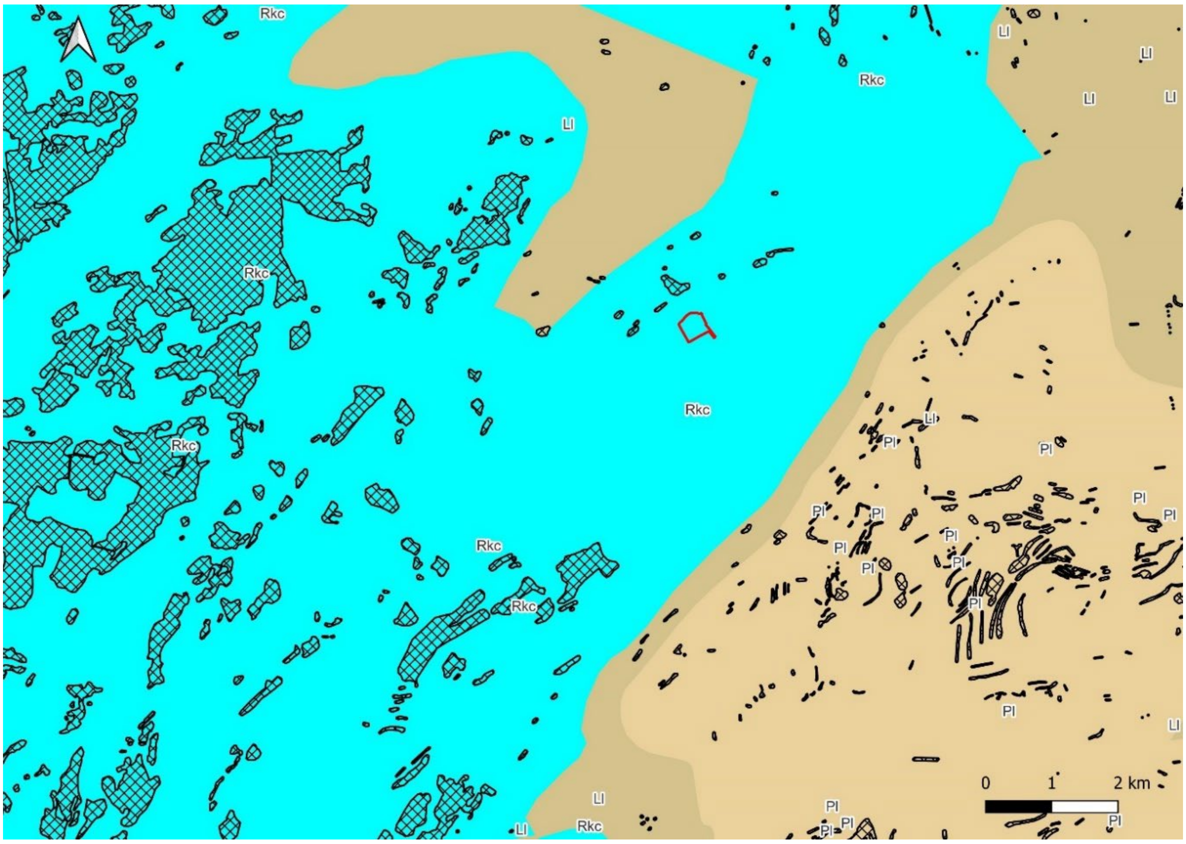

Figure 7.7 GSI Bedrock Aquifer Map classification

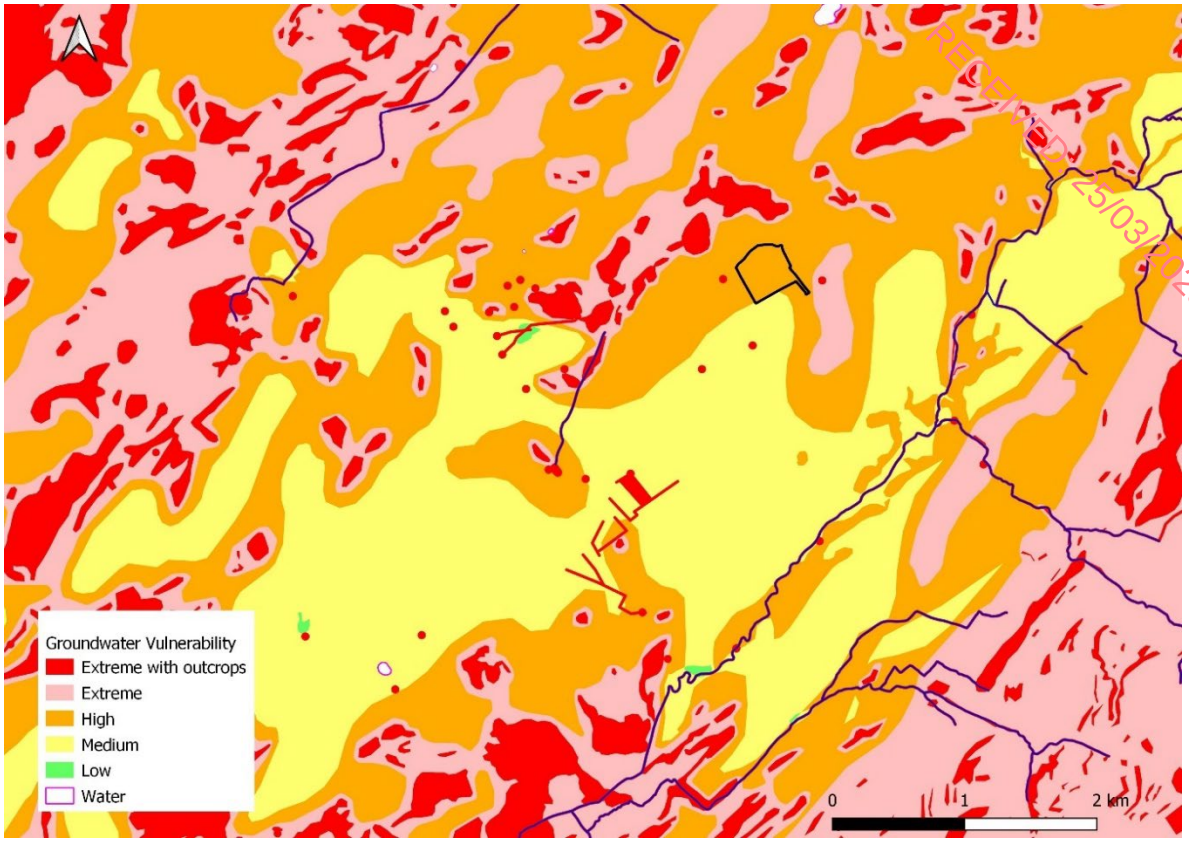

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Figure 7.8 GSI aquifer vulnerability map

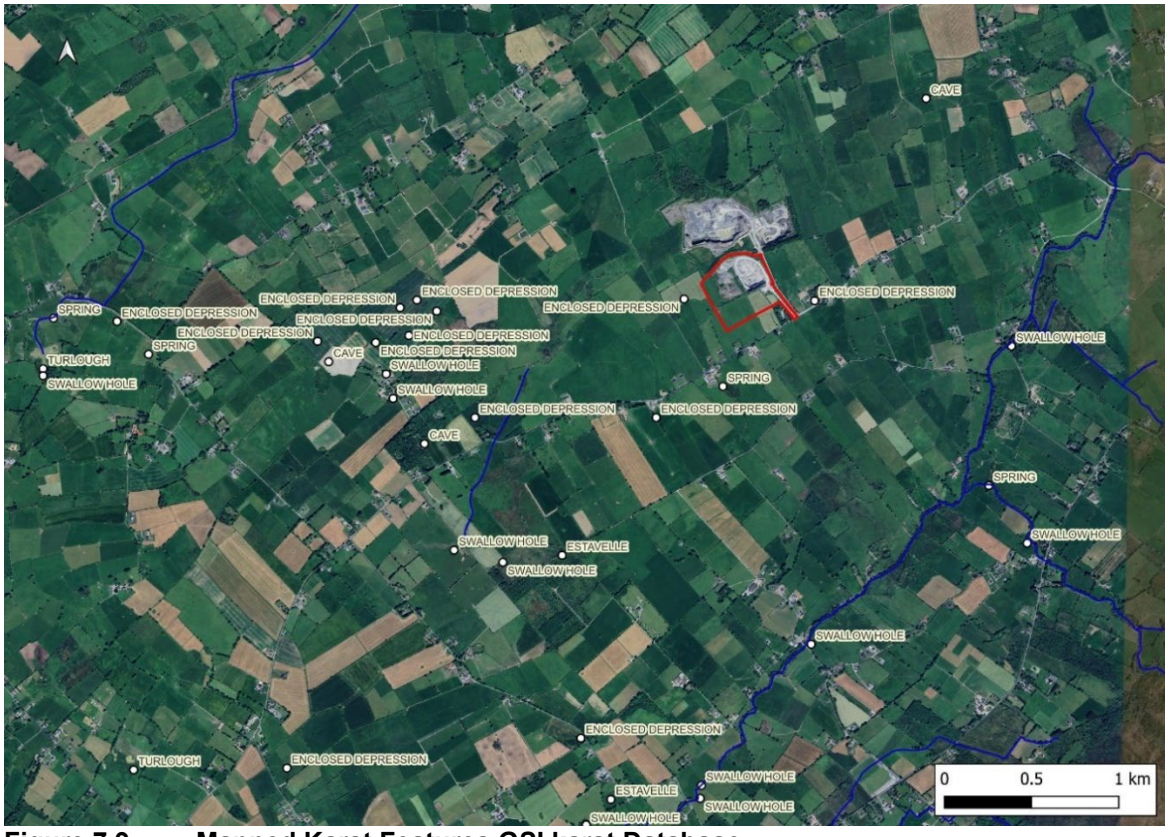

Figure 7.9 Mapped Karst Features GSI karst Database

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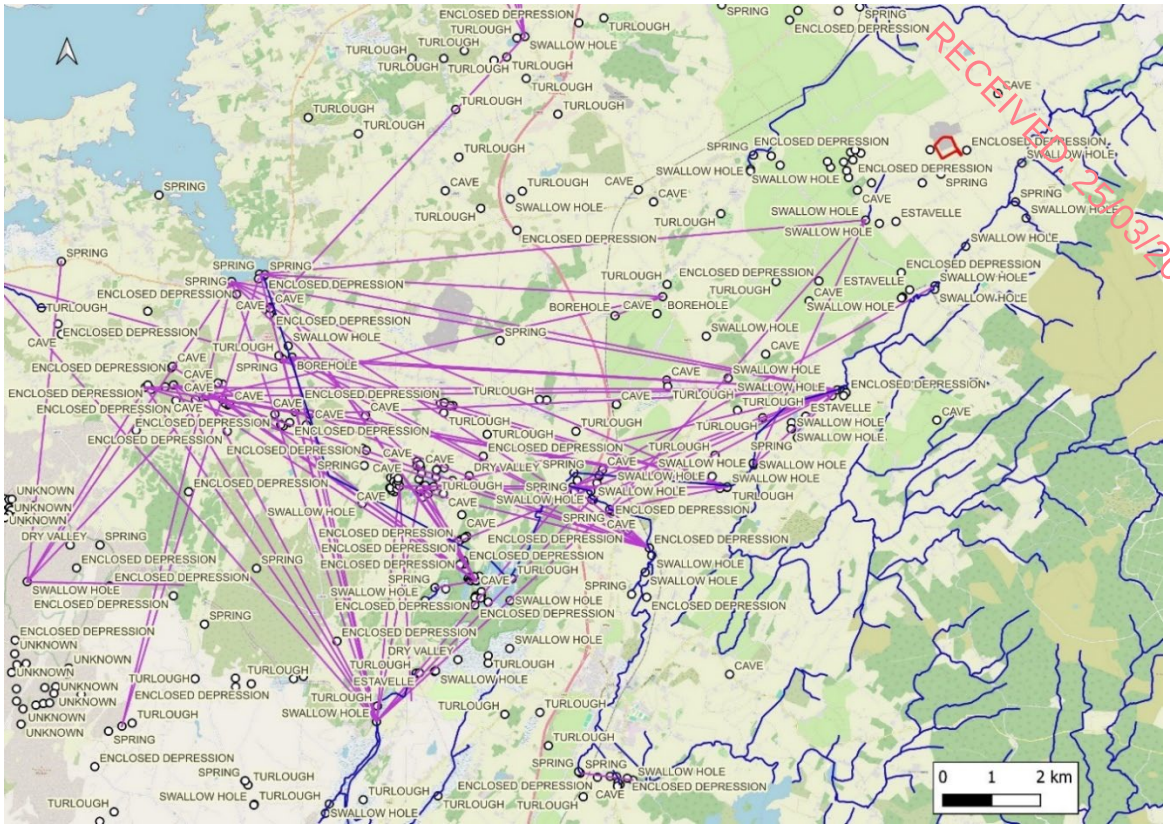

Figure 7.10 Karst Tracer lines indicating preferential karst conduit flow westwards and **northwest to Kinvarra**

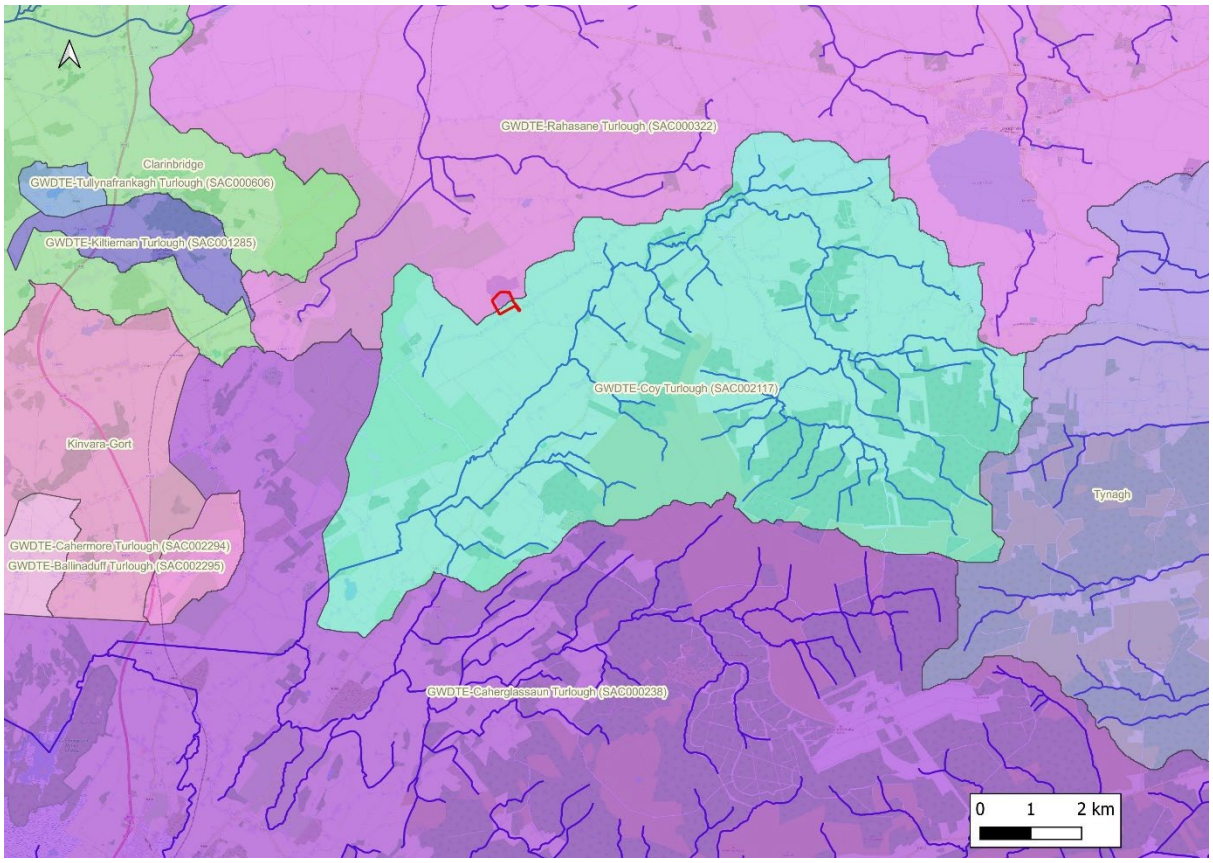

Figure 7.11 Water Framework Directive Groundwater body

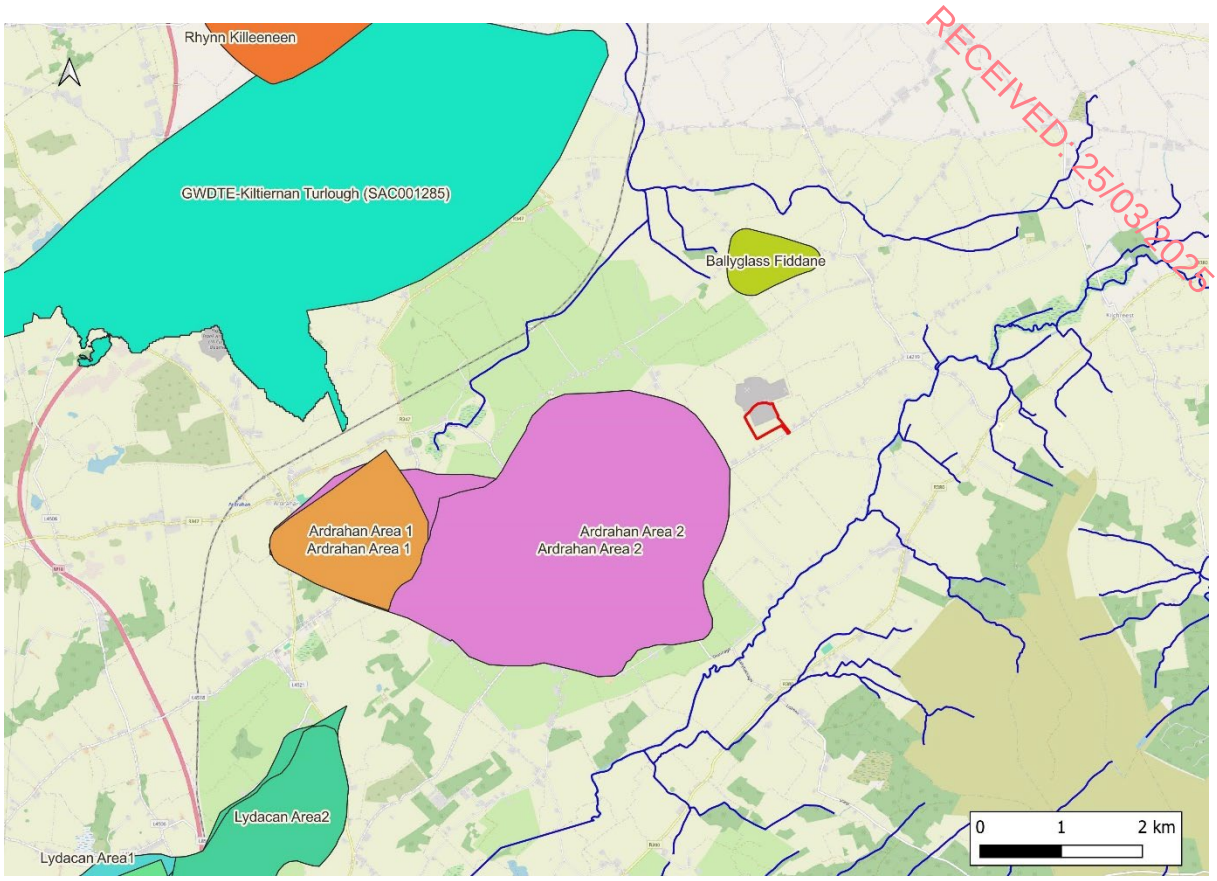

Figure 7.12 Public Groundwater Source Zone of Contribution

7.4 Potential Impacts

7.4.1 Introduction

Both the enabling works (overburden clearance and landscaping and the operation phase of quarrying and processing works are treated in this section as a single phase in respect to potential impacts on surface and groundwaters. The overburden clearance, stockpiling and reuse in bunds and landscaping can release sediments with the construction runoff. There are no surface watercourses that can be impacted and the site runoff water will remain within the quarry site allowing the suspended solids to settle out and the construction runoff to percolate away. The decommissioning works will involve restoration of various habitats with approximately 25% restored to pasture and the remainder restored to mixed habitats including bare stone habitats. The works will involve earthworks associated with the ripping up of any hardcore, macadam and concrete surfaces and the respreading pf any remaining stone, overburden and topsoil materials. The lower benches of the quarry will be allowed fill with water to form a pond. The site due to the hazard of the cliff face will be left secure so that the general public are unable to gain access. The decommissioning

earthwork processes and hydrology impacts are similar to the enabling works and quarrying works in regard to good site practice to prevent pollution.

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7.4.2 Surface waters

Quantitative impacts: As there will be no discharge of groundwater to surface watercourses from the proposed development and consequently there will be no possibility of adverse effect on local drains and watercourses. It is unlikely, that the nearest watercourse, a small field drain / stream rising 750m to the west of the site would be impacted and dry up as a result of the dewatering effect of the proposed quarry development which is very localised due to the locally unproductive nature of the bedrock aquifer and deep groundwater table. This watercourse may be considered a water supply for livestock. Dewatering of the quarry for the proposed lower bench of 25m OD will require pumped discharge to a percolation area. Failure of this percolation area could give rise to surface ponding and overland runoff which would make its way back into the quarry excavation area. To date this has not been an issue for the existing quarry operation.

Qualitative impacts: The proposed development will not have any significant impact on the water quality in surface watercourses. Depending on wind strength and direction, the deposition of dust on the surrounding fields may be carried by surface runoff into the watercourses. This will impact the pH and turbidity of the water as well as blocking the gills of aquatic life. This is highly unlikely given the low surface runoff coefficient of 15% for this karstic region with the majority of rainwater infiltrating through the shallow soils to the bedrock aquifer and the distance from the quarry to such watercourses.

There are no proposed direct surface water discharges to watercourses and thus no proposed point source of pollution.

7.4.3 Groundwater

7.4.3.1 Drawdown and dewatering

There are two proposed quarry benches, the upper one at 49m OD and lower northerly one at 25m OD. The 49m OD bench will be above the regional groundwater table, estimated at 40 to 45m OD, whereas the proposed lower bench at 25m OD is well below the regional

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groundwater table and could potentially exert a dewatering effect on the surrounding bedrock aquifer. The dewatering zone of influence is calculated using the following *Sichardt* Equation

Sichardt Equation:

$$R0 = C * (H - hw) * \sqrt{K}$$

Where:

R0 = Zone of Influence in m.
C = 3000 (Sichardt constant).
K = hydraulic conductivity in metres per second (m/s). Value of hydraulic conductivity of 1.0 x 10^{-5} m/s which is conservative estimate for fine grained limestone bedrock.
H-h_w = drawdown in metres (m). This was calculated using maximum depth of cut in metres below ground level 25m OD and the highest water level value based on regional groundwater flood levels of 45m OD.

Assumptions and limitations of *Sichardt* equation:

- *Sichardt* assumes radial flow paths from a well during normal pumping conditions in an unconfined aquifer with uniform hydraulic conductivity.
- As a conservative approach the regionally groundwater table level of 45m OD Malin is used.
- Bedrock is homogenous vertically and laterally, and therefore permeability value does not change.
- No seasonal change in groundwater level accounted for using winter groundwater flood levels.

Quarry RoI Calculation	
C=	3000
H-Hw=	20m
K=	1.00E-05
√K=	3.16E-03
R0=	**190m**

This equation indicates that the Quarry drawdown ZOI extends for 190m from the proposed 25m Quarry bench area, refer to Figure 7.12 below. This gives a zone of influence by the proposed Quarry excavation of 28.2ha which is very local and includes the existing quarry and part of the former roadstone quarry area. The zone of influence does not impact any groundwater ZOC or any European Site.

The impact of this on the Bedrock Aquifer and on the relevant groundwater bodies is insignificant and will not impact groundwater resources. In any case dewatering will be

discharged back to groundwater via the proposed engineered 2900m^2 soakaway under the carpark area of the site.

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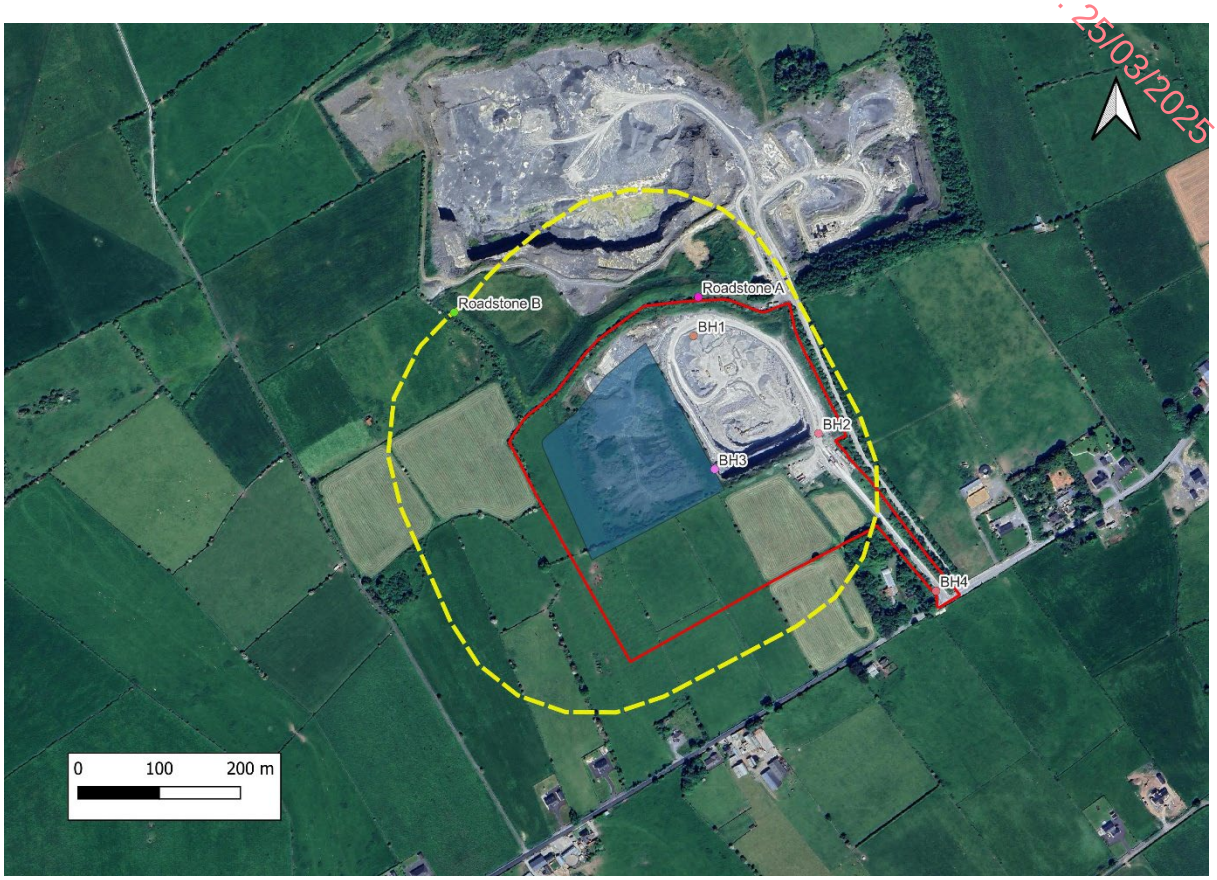

Figure 7.13 Mapped drawdown Zone of Influence by the proposed Quarry 25m bench excavation

7.4.3.2 Potential dewatering volume

The potential dewatering volume at the lower bench of 25m OD Malin is estimated based on annual effective rainfall and groundwater recharge rate of 60%. Direct rainfall onto the Quarry site accounts for 50% of the total volume and the remainder is via the bedrock aquifer from the ZOI.

Table 7.8 Annual rainfall, evaporation and recharge rates

Parameter	Value (mm/year)
Annual Rainfall mm	1155
Annual Potential Evaporation mm	508

Annual Actual Evaporation mm	483
Annual Effective Rainfall mm	672
Groundwater Recharge rate	60%
Annual Effective Recharge mm	403

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The total quarry, existing and proposed works area is approximately 12.66 ha which receives 100% of the effective rainfall. The remaining ZOI of 17.6ha has a potential groundwater recharge rate of 60% based on the GSI estimates. On an annual basis 142,000 m^3 of water potentially will enter the quarry when it reaches the lower bench of 25m OD, representing an average inflow rate of 4.5l/s. For much of the year this inflow can easily be managed through storage and recycling of water for dust suppression and wheel washing activities.

In prolonged rainfall periods, typically winter periods, this inflow will have to be disposed of through pumping from the excavation based on to the higher unquarried areas and allowed infiltrate to ground, like the existing practice at the quarry. It is proposed that an engineering soakaway area on the subject lands under the car parking area be constructed for this purpose to avoid any surface ponding and allow for direct percolation into the underlying weathered bedrock.

Due to the relatively deep groundwater table on the site, it will not be necessary to dewater the proposed extension area for the first number of years of the works, and thus there will be minimal impact to the groundwater flow paths in the area during this time. After this time when dewatering is potentially required, the excess water will be pumped to a soakaway percolation located under the car parking area within the quarry site area. The anticipated low volumes of water that will be discharged will not impact the overall groundwater flow system. Previous percolation tests show that high infiltration capacity is available on these lands to deal with the excess quarry waters produced during pluvial floods and groundwater inflow dewatering.

7.4.3.3 Groundwater aquifer

Once the overlying soil has been removed, the increase in surface area of exposed bedrock during development will increase the rate of groundwater recharge to the aquifer.

Qualitative impacts: With the removal of the 'protective' soil covering, the bedrock aquifer will be extremely vulnerable to contamination from surface runoff off hardstanding, or any spillages that occur on site. Possible contaminants will include hydrocarbons from machinery and fuel storage tanks, and domestic effluent associated with the septic tank.

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Any drawdown of the groundwater table into the dewatered quarry may draw poor quality groundwater into the aquifer. Possible contaminants would be associated with the landspreading of agricultural wastes on the surrounding land. There may also be a possibility that if the groundwater table is dewatered lower than in the adjoining quarry that any contaminants associated with that development could be drawn into the proposed site.

The drawdown zone of influence is very localised to 190m from the proposed lower Quarry bench due to the poor productivity of the bedrock on the site and consequently will not impact surrounding or downstream borehole well yields.

The potential impacts on groundwaters is a localised drawdown. This impact represents a local minor negative impact on the groundwater aquifer.

7.4.3.4 Pollution

The following 'Source-Pathway-Target' model, summarises the potential contamination sources ('hazards') which may result from the development, the potential pathways for contamination, and the aquifer and groundwater sources ('targets') which might be contaminated.

Hazards:

- Storage of fuel hydrocarbons in tanks; and
- Areas where spillages or leakages might occur (e.g. refuelling areas, loading bays and plant trafficked areas).

Pathways:

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- Contaminants will move downwards through bedrock to the groundwater table, and then downgradient with the groundwater flow away from the site, until dewatering is required which will draw the flow towards the quarry.
- Attenuation and dilution are likely to occur enroute due to the unproductive nature of the local bedrock.
- If contaminants migrate into preferential pathways they will arrive quickly to the targets.
- Regular visual inspection will give timely warning of any contamination.
- The use of monitoring points are unlikely to be adequate to detect migration of contaminants given the nature of karst limestone.

Targets:

- Regional Important karst Aquifer underlying the site; and
- Groundwater supply wells and boreholes down-gradient of the development.

The potential impact is hydrocarbon pollution from the plant activities on groundwater aquifer and represents a localised minor negative impact which can effectively be mitigated by good site practice in respect of refuelling and plant upkeep and maintenance, inspections, reporting and clean-up protocols and training.

7.4.4 European and National Sites

All SAC, SPA, NHA and pNHA sites within 15km radius of the quarry site are included in the tables below for impact assessment. The drawdown and dewatering impact on the groundwater aquifer is very localised at only 190m from the site and will not impact the groundwater regime at any of the European and national sites identified with the nearest site (Peterswell Turlough SAC and pNHA located 2.6km down gradient of the quarry site.

The potential impact to the hydraulically connected sites is pollution risk from accidental spillage of hydrocarbons associated with the Quarrying activities. Such a risk is relatively low given the scale of the quarry and is extremely localised given the relatively low productive aquifer based on previous pump testing and the water management experience for the existing quarry activities. A large portion of the dewatered water (estimated at

142,000 m^3 per annum) will be returned as recharge through storage and pumping up out of the quarry to proposed soakaway area on the subject site. The overall assessment is that the proposed development will have no perceptible impact on the hydrology and hydrogeology of any European or national important Site or on surface or ground water resources.

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There is no specific mitigation in respect to pollution required to protect the bedrock Aquifer, local and public groundwater supplies or any of the European and National Sites that have a hydrological pathway from the quarry. Normal good practices in respect to handling of hydrocarbons at the quarry is assumed in respect to spillage control in terms of plant upkeep, refuelling procedures and storage of hydrocarbons on site in a bunded areas and on impervious pads, the availability of spill kits and the logging of such incidents. The existing quarry has been operating for almost 20years with no serious pollution incidents occurring.

Table 7.9 Hydrological Impact Assessment of SACs

SAC Name	Distance (km)	Hydraulic Connection	Impact magnitude	Impact significance	Comment
Lough Rea SAC	8	None	Neutral	none	
Sonnagh Bog SAC	4.9	None	Neutral	none	
Rahasane Turlough SAC	6.9	groundwater and watercourses(Kilcolgan R)	negligible	insignificant	pollution from Quarrying activities hydrocarbon spillage
Castletaylor Complex SAC	5.6	groundwater	negligible	insignificant	pollution from Quarrying activities hydrocarbon spillages

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Kilkernan Turlough SAC	8.3	groundwater	negligible	insignificant	pollution from Quarrying activities hydrocarbon spillages
Ardrahane Grasslands SAC	6	groundwater	negligible	insignificant	pollution from Quarrying activities hydrocarbon spillages
Galway Bay Complex SAC	11.1	groundwater and watercourses	negligible	insignificant	pollution from Quarrying activities hydrocarbon spillages
Lough Fingal Complex SAC	8.6	groundwater	negligible	insignificant	pollution from Quarrying activities hydrocarbon spillages
Coole-garryland complex SAC	9.1	groundwater and watercourses	negligible	insignificant	pollution from Quarrying activities hydrocarbon spillages
Kiltartan Cave SAC	10	groundwater	negligible	insignificant	
Cahermore Turlough SAC	11	groundwater and surface flows	negligible	insignificant	pollution from Quarrying activities hydrocarbon spillages
Caherglassaun Turlough	11.7	groundwater and surface flows	negligible	insignificant	pollution from Quarrying activities hydrocarbon spillages
Peterswell Turlough	2.6	groundwater and watercourses (Kilchreest R)	negligible	insignificant	pollution from Quarrying activities hydrocarbon spillages
Lough Coy Turlough SAC	5.8	groundwater and watercourses (Kilchreest R)	negligible	insignificant	pollution from Quarrying activities hydrocarbon spillages
Carrowbaun, Newhall and Ballylee Turlough	6.3	groundwater and watercourses (Kilchreest R)	negligible	insignificant	pollution from Quarrying activities hydrocarbon spillages
Lough Cutra SAC	13	None	Neutral	none	
Drummin Wood SAC	13	None	Neutral	none	

Table 7.10 Hydrological Impact Assessment of SPAs

SPA Name	Distance (km)	Hydraulic Connection	Impact magnitude	Impact significance	Comment
Lough Rea SPA	8	None	Neutral	none	
Slieve Aughty SPA	4.9	None	Neutral	none	
Lough Cutra SPA	13	None	Neutral	none	
Rahasane SPA	6.9	groundwater and watercourses (Kilcolgan R)	Neutral	insignificant	pollution from Quarrying activities hydrocarbon spillage
Inner Galway Bay SPA	11.1	groundwater and watercourses	negligible	insignificant	pollution from Quarrying activities hydrocarbon spillages

Coole Garyland SPA	9.1	groundwater and watercourses	negligible	insignificant	pollution from Quarrying activities hydrocarbon spillages

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Table 7.11 Hydrological Impact Assessment of NHAs and pNHAs

NHAs and pNHAs	Distance (km)	Hydraulic Connection	Impact magnitude	Impact significance	Comment
Slieve Aughty Bog NHA	13	None	Neutral	none	
Rahasane Turlough pNHA	6.9	groundwater and watercourses (Kilcolgan R)	Neutral	none	pollution from Quarrying activities hydrocarbon spillage
Lough Cutra pNHA	13	None	Neutral	none	
Lough Rea pNHA	8	None	Neutral	none	

Kiltartan Cave pNHA	10	Groundwater	negligible	none	
Polldulagh Cave Gort pNHA	14.6	None	Neutral	none	
Sonnagh Bog pNHA	4.9	None	Neutral	insignificant	pollution from Quarrying activities hydrocarbon spillage
Peterswell Turlough pNHA	2.6	groundwater and watercourses (Kilchreest R)	negligible	insignificant	pollution from Quarrying activities hydrocarbon spillage
Caherclassaun Turlough pNHA	11.7	Groundwater	negligible	insignificant	pollution from Quarrying activities hydrocarbon spillage
Castletaylor Complex pNHA	5.6	Groundwater	negligible	insignificant	pollution from Quarrying activities hydrocarbon spillage
Lough Fingall Complex pNHA	8.6	Groundwater	negligible	insignificant	pollution from Quarrying activities hydrocarbon spillage
Kiltieran Turlough pNHA	8.3	Groundwater	negligible	insignificant	pollution from Quarrying activities hydrocarbon spillage
Galway Bay Complex pNHA	11.1	groundwater and watercourses	negligible	insignificant	pollution from Quarrying activities hydrocarbon spillages
Coole Garyland Complex pNHA	9.1	groundwater and watercourses	negligible	insignificant	pollution from Quarrying activities hydrocarbon spillages

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7.5 Mitigation Measures

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7.5.1 Surface water

The runoff from refuelling and hydrocarbon storage areas will be bunded. In the event of accidental spillage within the bunded area a clean-up will be required and removal off-site the contaminated waters to a licensed waste operator for treatment and disposal.

Pollution reporting protocols and a log will be in place to ensure that any accidental spillages are inspected and logged and the appropriate clean-up action is taken in a timely and effective manner. Regular training in pollution management protocols and risk assessments and in the use of spill kits will be provided to all personnel.

All pumped surface runoff and dewatering waters will undergo settlement in a sump at the quarry floor prior to being pumped up out of the Quarry for disposal to ground via engineered soakaway area to be located under the carparking area.

Adequate lands and percolation testing should be carried out to ensure sufficient infiltration capacity is available and avoid any surface ponding and surface runoff onto adjoining lands from the quarry.

7.5.2 Groundwater

During development works, if required, a sump in the quarry floor or a network of dewatering boreholes will be required to ensure that the groundwater table is maintained below the current working bench level. All dewatered groundwater will be pumped to a settlement pond from where it will be discharged to an engineered percolation soakaway area.

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A water monitoring well (BH4) was installed as part of the Hydrogeological assessments for the existing quarry and monitored and reported on by an independent approved water quality testing laboratory and the results available for inspection. This practice should continue and should also include testing of the water supply borehole source (BH03). This can be monitored from the site office tap on the site.

There is no specific mitigation required to protect any of the European and national Sites that have a hydrological pathway from the quarry site to these receptor in respect to pollution. Normal good practices in respect to hydrocarbon spillage control in terms of plant upkeep, refuelling and storage of hydrocarbons on site is assumed. The existing quarry has been operating for almost 20years with no serious pollution incidents occurring.

7.6 PREDICTED RESIDUAL IMPACTS

7.6.1 Construction Phase

There are no predicted significant impacts on Hydrology and Hydrogeology. Potential residual impacts are negligible in respect to surface hydrology and minor negative in respect to hydrogeology, associated with potential pollution risks from the topsoil and overburden clearance and landscaping works.

7.6.2 Operational Phase

There are no predicted significant impacts on Hydrology and Hydrogeology. Potential residual impacts are negligible in respect to surface hydrology and minor negative in respect to hydrogeology, associated with potential pollution risks from the quarrying works.

7.6.3 Cumulative Impact

The proposed quarry impacts on hydrology and hydrogeology are very localised and of minor to no significance, both in respect to water quality and flow regime change within the surface and groundwater bodies. There are presently no planned or in construction projects

that could have a cumulative or in combination negative impact with the proposed quarry development on either surface hydrology or hydrogeology.

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7.6.4 'Worst-Case' Scenario

Given the nature of the Site and its underlying regionally important karst aquifer a potential 'worst-case' scenario would be a major spillage of hydrocarbons on the site. The risk of this is limited by bunding of the fuel tanks with the bunded volume sufficient to contain the tank volume. Spillage during refuelling of plant and plant leakage would not lead to a significant pollution incident of the aquifer given is unproductive nature and would allow sufficient time for deployment of spill kits and clean-up. Another 'worst-case' scenario would be flooding of the quarry floor during an extreme flood event. The impact of this would only cause a stoppage of quarrying activities until such time as the flood volume can be evacuated and disposed to groundwater via the engineered soakaway. Failure of the soakaway may require another soakaway area to be used for disposal. These 'worst-case' impacts do not represent a significant impact on hydrology and hydrogeology.

7.7 Conclusion

The proposed Quarry extension at the existing quarry will potentially result in a slightly larger groundwater zone of influence in terms of drawdown and potential dewatering of the local bedrock aquifer. The zone of influence on groundwater levels extends 190m from the proposed lower quarry bench boundary and therefore will not impact local groundwater supplies or any of the larger public sources and their contribution areas. Achieving a bench level of 25m OD which is currently c. 3.5m below the lowest levels in the existing quarry operation will require disposal of the direct recharge and groundwater inflow from its zone of influence. This will require some winter pumping during wet antecedent periods to an engineered soakaway area on the quarry site for safe disposal to ground as recharge. To avoid any potential ponding and surface overland runoff this percolation area needs to be sized appropriately to cater for the pumped discharge volumes. These pumped discharge volumes will not be very large given the observed poor permeability and yield from the local bedrock surrounding the quarry excavation site.

The drawdown zone of influence is very localised to 190m from the proposed lower Quarry bench due to the poor productivity of the bedrock on the site and consequently will not impact surrounding or downstream well yields.

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12.7 MONITORING AND REINSTATEMENT MEASURES

Post-development monitoring issues or reinstatement measures with respect to hydrology and hydrogeology are not considered a requirement with respect to the subject development.

12.8 INTERACTIONS

Hydrology and hydrogeology can have interactions with Biodiversity, material assets, public Health and Climate. The proposed quarry development as proposed will not have any significant impacts with respect to hydrology and hydrogeology. Consequently, there will be no interactions with any other aspects of the environment

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CHAPTER 8

AIR QUALITY & DUST

8. AIR QUALITY AND DUST

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8.1 INTRODUCTION

This air quality & dust impact assessment has been prepared to accompany a planning application, which seeks permission for the continuation and extension of the existing quarry in the townland of Isertkelly North, Kilchreest, Loughrea, Co. Galway.

The lands proposed for the extraction of limestone is accessed via a private road and enters onto a local road which is an authorised access. The planning application boundary is 12.66 hectares with the proposal for extraction of limestone within c 7.5 hectares using conventional drilling and blasting techniques and mineral reduction using mobile crushing and screening. The quarrying excavation operation will progress in a westerly and southerly direction from the existing quarry boundary.

The proposed development will be a continuation of the current quarrying activity. There are no proposed amendments to the inputs, processes or outputs at the existing quarrying activity as part of this application, other than the proposed extension of the activity boundary and extraction areas. An extraction capacity of up to 120,000 tonnes per annum is sought to provide the applicant with the ability to respond to demand for aggregates in the region. . All existing prefabricated building are to be removed and replaced with a permanent office building which will contain offices, toilet, canteen etc. A new plant maintenance shed will also be constructed. Permission is sought for a period of 25 years in order to extract a known resource.

This Air Quality Impact Assessment report has been prepared by Mervyn Keegan to be included as a standalone section within the EIAR . Mervyn Keegan is a Director of the environmental consultancy, AONA Environmental Consulting Ltd. Mervyn Keegan's areas of professional expertise are in Noise Control & Acoustics and Air Quality & Odour consultancy. Mervyn Keegan has over 25 years of environmental consultancy experience. Mervyn is a full member of the Institute of Acoustics, the Institute of Environmental Sciences and the Institute of Air Quality Management. Mervyn has a Bachelor of Science Degree (Applied Sciences), a Master of Science Degree (Environmental Science) and a Diploma in Acoustics in Noise Control. AONA Environmental Consulting Ltd. is an independent consultancy specialising in Environmental Impact Assessment and Licensing. Mervyn Keegan has prepared in excess of ten Noise & Vibration and Air Quality impact assessments annually for quarry developments in the Republic of Ireland, Northern Ireland and the UK in the last 20 years and is an expert in the awareness and understanding of the relevant legislation and guidance that pertains to best practise in such assessments. Mervyn Keegan has appeared as an Expert Witness at oral hearings, public inquiries and legal hearings. Mervyn Keegan has produced Noise, Air Quality & Odour Impact Assessment reports to assess the impacts of a range of development types including roads, residential developments, industrial developments, quarries and mines and wind energy developments among others.

8.2 METHODOLOGY

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8.2.1 Impact Assessment Methodology

This assessment of the air quality & dust impact has been undertaken as follows:

- Reference to available air quality monitoring data and published background air quality information for the area, to establish the current air quality and dust deposition rates in the area.
- An assessment of the air quality & dust impact at the surrounding residential properties from the proposed drill and blast and mineral extraction including mobile crushing and screening and haul road movements.

8.2.2 Relevant Guidelines & Standards

The Quarries and Ancillary Activities, Guidelines for Planning Authorities states that following with regard to the control of dust;

"There are currently no Irish statutory standards or EPA guidelines relating specifically to dust deposition thresholds for inert mineral/aggregate dust. (See, however, the Air Quality Standards Regulations 2002 for measurement standards). There are a number of methods to measure dust deposition (such as the Frisbee method) but only the German TA Luft Air Quality Standard relates a specific method (i.e. Bergerhoff) of measuring dust deposition with dust nuisance. On this basis it is recommended that the following TA Luft dust deposition limit value be adopted at site boundaries near quarry developments:

Total dust deposition (soluble and insoluble): 350 milligram per square metre per day (when averaged over a 30-day period).

Best practice dust control measures should be proposed by the applicant".

On the basis of the above, the following limits apply to the operation of the quarry and associated manufacturing activities and will continue to apply during the proposed development;

Total dust deposition (soluble and insoluble): 350 mg/m^2/day (when averaged over a 30-day period).

Environmental Management at the site is carried out in compliance with legal requirements and under the conditions of previous planning application 05/2870 These planning decisions provide general obligations for the site to maintain various aspects of the environment and amenity of the site and surrounding area, as well as specific requirements for the monitoring of potential impacts from the quarrying activity. Dust monitoring is carried out quarterly. A limit of 350 mg/m^2 over a 30 day monitoring period is in place for the site, in accordance with the guidance document BPA (2006) Environmental Management in the Extractive Industry and German TA Luft Air Quality Standard (Bergeroff).

The sampling is conducted monthly at three dust monitoring points D1, D2 and D3 as indicated in Figure 3 and Figure 4. Environmental dust monitoring results from 2021 – 2024 for each monitoring period are presented in Table 7, which indicates compliance with the dust levels imposed as a planning condition in the planning application 05/2870.

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Guidance on the Assessment of Mineral Dust Impacts (Institute of Air Quality Management - IAQM)

The Institute of Air Quality Management (IAQM) guidance document entitled Guidance on the Assessment of Mineral Dust Impacts for Planning (2016 V1.1), outlines that *"emissions of dust to air from minerals sites can occur during the preparation of the land, extraction, processing, handling and transportation of extracted minerals. Emissions can vary substantially from day to day, depending on the level of activity, the specific operations being undertaken, and the weather conditions. The scale of these impacts depends on the dust suppression and other mitigation measures applied".*

An Operational Dust Impact Assessment has been undertaken with reference to the IAQM Guidance on the Assessment of Mineral Dust Impacts for Planning (May 2016, v 1.1).

This guidance provides advice on robust and consistent good-practice approaches that can be used to assess the operational-phase dust impacts for use in the planning process. The IAQM guidance document outlines a methodology by which it is possible to screen out the need for a detailed assessment based on the distance from a mineral site to potentially sensitive receptors and where the potential dust impact of a mineral site cannot be 'screened out', a more detailed dust assessment will be required.

The IAQM Guidance provides a flow chart to assess whether a detailed dust assessment should be undertaken. If there are no relevant receptors within 1 km of the operations, then a detailed dust assessment can be screened out. In such a case, it is considered that irrespective of the nature, size and operation of the site, the risk of an impact is likely to be "negligible" and any resulting effects are likely to be 'not significant'. In cases whereby receptors are located between 400m, or 250m (depending on the rock type) and 1km of operations, it would normally be assumed that a detailed disamenity dust impact assessment is not required. However, the decision on whether to assess should be made and justified on a site-specific basis by a suitably experienced air quality professional. If there are relevant human and/or ecological receptors within 250 m or 400 m (depending on the rock type) then a disamenity dust impact assessment will almost always be required, which means that assessments are required for most minerals development schemes. Therefore, in the case of the proposed development, it is not possible for potential dust impact to be 'screened out', a more detailed dust assessment is required.

The IAQM Guidance on the Assessment of Mineral Dust Impacts for Planning gives an illustrative example of a dust risk assessment for a minerals site based on the underlying IAQM assessment procedure set out in Section 5.1 of the guidance in Appendix 3. The

example provides a series of assessment matrices which are used to estimate the Dust Impact Risk, the Pathway Effectiveness and the Likely Magnitude of Disamenity Effects at each receptor. The latter is used to determine whether overall there is likely to be a significant effect or not on the surrounding area.

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For the sensitivity of people to the health effects of PM_{10}, the IAQM recommends that the air quality practitioner assumes that there are three sensitivities based on whether or not the receptor is likely to be exposed to elevated concentrations over a 24-hour period.

- High sensitivity receptor - Locations where members of the public are exposed over a time period relevant to the air quality objective for PM10 (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). Indicative examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.

- Medium sensitivity receptor - Locations where people are occupationally exposed over a full working day. indicative examples include offices, warehouses and industrial units.

- Low sensitivity receptor - Locations where human exposure is transient. Indicative examples public footpaths, playing fields, parks and shopping streets.

In terms of the protection of the sensitive ecological habitats, the Guidance on the Assessment of Mineral Dust Impacts for Planning states that professional judgement is required to identify where on the spectrum between high and low sensitivity a receptor lies, taking into account the likely effect and the value of the ecological asset. A habitat may be highly valuable but not sensitive, alternatively it may be less valuable but more sensitive to dust deposition. For the sensitivity of ecosystems to dust deposition the IAQM recommends that an ecologist is consulted to determine the potential effects on plant communities. The IAQM guidance defines high, medium and low sensitivity ecological receptors as follows;

- High sensitivity receptor – Locations with an international designation and the designated features may be affected by dust soiling. Locations where there is a community of a particular dust sensitive species such as vascular species. An indicative example is a Special Area of Conservation (SAC) designated for acid heathlands adjacent to a minerals development releasing alkaline dusts.

- Medium sensitivity receptor – Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; nationally designated site and the designated features may be affected by dust deposition; or indicative examples include Sites of Special Scientific Interest (SSSIs) or a local wildlife sites with very specific sensitivities.

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- Low sensitivity receptor – locations with a local designation where the features may be affected by dust deposition. An indicative example is a local Nature Reserve with dust sensitive features.

The IAQM guidance states that "an 'ecological receptor' refers to any sensitive habitat affected by dust deposition. This includes the direct impacts on vegetation or aquatic ecosystems, and the indirect impacts on fauna (e.g. on foraging habitats). For locations with a statutory designation, e.g. Special Areas of Conservation (SACs) and Sites of Special Scientific Interest (SSSIs), consideration should be given as to whether the particular site is sensitive to dust and this will depend on why it has been designated. Some non-statutory sites (i.e. local wildlife sites) and/or locations with very specific sensitivities may also be considered if appropriate. The level of dust deposition likely to lead to a change in vegetation is very high (over 1,000 mg/m^2/day) and the likelihood of a significant effect is therefore very low except on the sites with the highest dust release close to sensitive habitats".

Irish Legislation

Statutory standards exist for concentrations of suspended particulate matter (both PM_{10} and the $PM_{2.5}$) under The Air Quality Standards Regulations 2011.

The Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive (2008/50/EC) was transposed into Irish legislation by the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011). The Directive (2004/107/EC) was transposed into Irish legislation by the Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations 2009 (S.I. No. 58 of 2009).

The EU air quality standards and objectives set out in the ambient air quality directives 2004/107/EC and 2008/50/EC https://environment.ec.europa.eu/topics/air/air-quality_enhave been revised in the Directive 2024/2881 of the European Parliament and of the Council of 23rd October 2024 on ambient air quality and cleaner air for Europe (recast).

The revised Ambient Air Quality Directive which entered into force on 10th December 2024, tightens restrictions on a number of key air pollutants which have been demonstrated to be harmful to human health. Directive 2024/2881 brings the limit on harmful pollutants closer to those recommended by the World Health Organization (2021).

This directive has to be implemented in national regulation on 11th December 2026, at the latest and member states must meet the new air quality standards by 2030.

The Commission will adopt secondary legislation (implementing acts) to complement the new rules and assist with their application. In the interim period, before 2030, the 2008 limit and target values will continue to apply and member States are permitted to introduce more stringent requirements.

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The revised ambient air quality directive updates air quality standards, lowering the allowable levels for twelve air pollutants: particulate matter ($PM_{2.5}$ and PM_{10}), nitrogen dioxide (NO_2) and nitrogen oxides (NOx), sulphur dioxide (SO_2), ozone (O_3), carbon monoxide, benzene, benzo(a)pyrene, arsenic, cadmium, nickel, and lead. The new Directive cuts the allowed annual limit value for the main air pollutant – fine particulate matter ($PM_{2.5}$) by more than half. Table 8.1 and table 8.2 show the National, EU & WHO Limit Values(µg/m^3) for PM10 and PM2.5 respectively.

Pollutant	**Average Period**	**Air Quality Limit Values**		
		Current EU 2008 Limit Values (µg/m^3)	**EU 2024 Limit Values (µg/m^3) (Limit values for the protection of human health to be attained by 1st January 2030)**	**WHO 2021 Air Quality Guidelines (µg/m^3)**
Particulate Matter (PM_{10})	Annual Mean	40 µg/m^3	20 µg/m^3	5 µg/m^3
	Daily Mean	50 µg/m^3 (not be exceeded >35 times per year)	45 µg/m^3 (not to be exceeded >18 times per calendar year)	45 µg/m^3

Table 8.1 National, EU & WHO PM_{10} Limit Values(µg/m^3)

Pollutant	**Average Period**	**Air Quality Limit Values**		
		Current EU 2008 Limit Values (µg/m^3)	**EU 2024 Limit Values (µg/m^3) (Limit values for the protection of human health to be attained by 1st January 2030)**	**WHO 2021 Air Quality Guidelines (µg/m^3)**
Particulate Matter ($PM_{2.5}$)	Annual Mean	25 µg/m^3	10 µg/m^3	10 µg/m^3
	Daily Mean	-	25 µg/m^3 (not to be exceeded >18 times per calendar year)	15 µg/m^3

Table 8.2 National, EU & WHO $PM_{2.5}$ Limit Values(µg/m^3)

Dust Standards & Guideline Values

No statutory air quality criterion has been set at a European, National or World Health Organisation (WHO) level, although a range of national 'yardstick' criteria from many countries is found in literature.

In 2005, the UK Highways Agency released an Interim Advice Note 61/05 'Guidance for Undertaking Environmental Assessment of Air Quality for Sensitive Ecosystems in Internationally Designated Nature Conservation Sites and SSSIs' as a supplement to the Design Manual for Roads and Bridges (DMRB) Guidelines. This interim guidance states that

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dust or particles falling onto plants can physically smother the leaves affecting photosynthesis, respiration and transpiration. The literature suggests that the most sensitive species appear to be affected by dust deposition at levels above 1,000 mg/m2/day which is higher than the level at which most dust deposition may start to cause a perceptible nuisance to humans. As such, once dust deposition rates are maintained within the guidelines for human nuisance the impact of dust deposition on sensitive ecosystems is considered negligible.

Therefore, the following dust limits should be used in the assessment of dust levels from the proposed quarry extension;

- PM_{10} 24 Hour Mean concentration limit = 50 µg/m3 not to be exceeded more than 35 times a calendar year
- PM_{10} Annual Mean concentration limit = 40 µg/m3
- $PM_{2.5}$ Annual Mean concentration limit = 25 µg/m3
- Dust Deposition Rate limit affecting sensitive ecological receptors = 1,000 mg/m^2/day using a Bergerhoff gauge. (Ref. The Highways Agency, Design Manual for Roads and Bridges)

8.2.3 Dust Deposition Impact Assessment

In quarries, dust typically becomes airborne due to the action of wind on material stockpiles and other dusty surfaces, or when thrown up by mechanical action, for example the movement of tyres on a dusty road or activities such as blasting, drilling, screening, etc. There are many types of particulate matter (PM) that are included in the definition of dust, including variations in terms of size and chemical composition.

A basic classification of particles may be made into those that are easily deposited and those that remain suspended in the air for long periods. This division is useful as deposited dust is usually the coarse fraction of particulates that causes dust annoyance, whereas suspended particulate matter is implicated more in exposure impacts.

Airborne particles have a large range of diameters, from nano-particles and ultrafine particles (diameters less than 0.1µm) to the very large particles with diameters up towards 100µm. There is no clear dividing line between the sizes of suspended particulates and deposited particulates, although particles with diameters >50 µm tend to be deposited quickly and particles of diameter <10 µm have an extremely low deposition rate in comparison. Therefore, the size of suspended and deposited dust particles affects their distribution and as such requires two very different approaches to sampling these fractions.

Large particles (100µm diameter) are likely to settle within 5-10m of their source under a typical mean wind speed of 4-5 m/s, and particles between 30-100 µm diameter are likely to settle within 100m of the source. Smaller particles, particularly those <10 µm in diameter,

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have a greater potential to have their settling rate impeded by atmospheric turbulence and to be transported further from their source. Dust emissions are exacerbated by dry weather and high wind speeds. Therefore, the dust deposition impact depends on the wind direction and the relative location of the dust source and receptor.

PM_{10} is the fraction of airborne (suspended) PM which contains particles of diameter less than 10µm. PM_{10} includes all particles, of different sizes and types, which are relevant for potential health effects. PM_{10} can penetrate deep into the respiratory system increasing the risk of respiratory and cardiovascular disorders.

Dust emissions can arise as a result of operational activities, and /or wind erosion of exposed surfaces. The amount of dust that is raised is highly dependent upon a number of interrelated factors, which include:

- The nature of the material;
- The prevailing meteorological conditions;
- The activities being undertaken;
- The influence of any on site mitigation measures.

In terms of baseline disamenity dust data, previous guidance for the minerals industry suggests that typical dust deposition rates range from 10 to 50 mg/m^2/day in rural areas, 30 to 80 mg/m^2/day in suburban areas and 80 to 160 mg/m^2/day in town centre or industrial areas [Waller Associates for Dept. of Environment (1991) Environmental Effects of Surface Mineral Workings]. A study by the UK Office of Deputy Prime Minister (UK ODPM, 2002) Controlling the Environmental Effects of Recycled and Secondary Aggregates Production Good Practice Guidance, gives estimates of likely dust deposition levels in specific types of environments. In open country a level of 39 mg/m^2/day is typical, rising to 59 mg/m^2/day on the outskirts of a town and 127 mg/m^2/day for a purely industrial area.

The prevailing meteorological conditions are the most significant issue which will affect the rate of dust deposition outside of the boundary of a quarry and its associated activities. Therefore, it can be assumed that during the drier months of the year, there is the potential for dust deposition rates to be higher than the annual average dust deposition rate. In order to establish an accurate existing baseline dust deposition level in the area, a 12 month dust deposition survey typically needs to be carried out. The immediate area around the Quarry site can be categorised as a "rural area with little development". Therefore, it is considered that it is reasonable to assume that the background dust deposition rates for such an area is approximately 50 mg/m^2/day.

Dust deposition monitoring has been undertaken historically in proximity to the Quarry site in accordance with the German Standard Method VDI 2119 – *'Measurement of Dustfall, Determination of Dustfall using Bergerhoff Instrument (Standard Method) German Institute)*'. Using this method, dust deposition monitoring surveys comprise of positioning of Bergerhoff

Dust Deposit Gauges at specific locations for a period of 30 (+- 2) days. After the exposure period is complete, the gauges are removed from the site and transported to an accredited laboratory under a strict chain of custody for analysis. The samples are evaporated down and the dry residue, and the total dust content determined gravimetrically and the result reported in mg/sample. Results are expressed as a dust deposition rate in mg/m^2/day in accordance with the relevant standard.

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8.3 ASSESSMENT OF BASELINE CONDITIONS

8.3.1 Baseline Air Quality Data

The background air quality in the area of the development is recognised to be of very good quality and the site is located in the 'Zone D' area, as denoted by the EPA. The EPA has divided the country into zones for the assessment and management of air quality. The zones adopted in Ireland are Zone A, the Dublin conurbation; Zone B, the Cork conurbation; Zone C, comprising 21 large towns in Ireland with a population >15,000; and Zone D, the remaining area of Ireland. Concentrations of air quality pollutants in Zone D are very low and well below the relevant air quality limit values.

A long established Roadstone quarry is located c.60m north of the proposed development site and existing quarry boundary. This quarry has been in operation at this location for many decades. However, it has been closed since July 2024. The full quarry area covers c.20ha. with facilities associated with its operation including offices, weighbridge at the entrance to the site, with other associated manufacturing facilities including a concrete batching plant, block making plan and an asphalt/bitumen plant located towards the south and western areas of the wider quarry site. Processing of materials on site also takes place including crushing, screening and washing of aggregate. As the Roadstone quarry is currently closed and its reinstatement is unknown, the background air quality at present is most likely to be typical of rural areas, being primarily influenced by the existing quarry activities associated with the proposed site, local traffic and agricultural activities, etc.

The Environmental Protection Agency's Air Quality Index for Health (AQIH) provides a scaled number from one to ten that identifies the current air quality currently in a region and whether or not this might affect human health. A reading of ten means the air quality is very poor and a reading of one to three inclusive means that the air quality is good. The AQIH indicates that the area surrounding the Quarry site is in an area of good air quality.

Based on the Environmental Protection Agency's Air Quality in Ireland Report 2023, the following background concentrations are likely in the area;

- Nitrogen dioxide (NO_2) – Zone D Average = 8.1 µg/m^3 – Limit Value 40 µg/m^3
- Sulphur dioxide (SO_2) – Zone D Average = 4.3 µg/m^3 – Limit Value 20 µg/m^3 (for the protection of vegetation)

- Particulate Matter (PM_{10}) – Zone D Average = 11.0 µg/m^3 – Limit Value 40 µg/m^3
- Particulate Matter ($PM_{2.5}$) – Zone D Average = 7.1 µg/m^3 – Limit Value 25 µg/m^3
- Nitrogen oxides (NOx) – Zone D Average = 16.3 µg/m^3 – Limit Value 30 µg/m^3 (for the protection of vegetation)

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8.3.2 Dust Deposition Monitoring Results

The surrounding lands can be characterised as rural in nature with land uses in the area identified as roads, agriculture, extractive and single house residential. The existing quarry operations and adjacent roadstone quarry and associated concrete activities are an established land use in the locality.

Environmental Efficiency Consultants Ltd conduct environmental dust deposition monitoring on a quarterly basis at Kilchreest Quarry. Environmental Efficiency collects Bergerhoff bottles on-site following each monitoring period and, upon return to the laboratory, conducts testing in accordance with the company's internal SOP's; SOP 03.04 Determination of Suspended Solids/SOP 99.12 Total Dust Deposition, to determine Total Dust Deposition at each monitoring location in mg/m2/day. Results are subsequently compared to a dust limit value of 350 mg/m2/day, as prescribed by German TA Luft Guidelines, to determine whether dust levels constitute levels which are not acceptable as per this environmental quality standard (i.e., levels at which there may be nuisance caused or hazard posed). The sampling is conducted monthly at three dust monitoring points D1, D2 and D3 as indicated in Figure 8.1 and Figure 8.2. Figure 8.1 depicts the dust monitoring locations.

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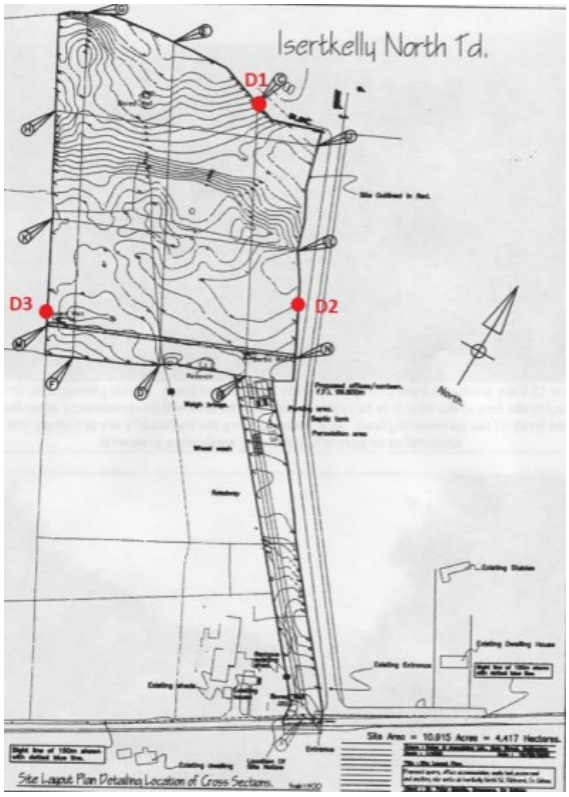

Figure 8.1 Dust Monitoring Locations 2020-2023

Figure 8.2 Dust Monitoring Locations 2024

Environmental dust monitoring results from 2021 – 2024 for each monitoring period are presented in Table 8.3.

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Period	Date	Location	Result
Q1 2021	15-02-2021 to 15-03-2021	D1	2.3 mg/m^2/day
		D2	11.9 mg/m^2/day
		D3	6.1 mg/m^2/day
Q2 2021	24-05-2021 to 07-07-2024	D1	2.7 mg/m^2/day
		D2	0.7 mg/m^2/day
		D3	13.3 mg/m^2/day
Q3 2021	23-08-2021 to 23-09-2021	D1	9.2 mg/m^2/day
		D2	6.6 mg/m^2/day
		D3	4.8 mg/m^2/day
Q2 2022	30-05-2022 to 29-06-2022	D1	119 mg/m^2/day
		D2	44 mg/m^2/day
		D3	32 mg/m^2/day
Q3 2022	20-08-2022 to 08-10-2022	D1	72.6 mg/m^2/day
		D2	6.6 mg/m^2/day
		D3	46.9 mg/m^2/day
Q4 2022	01-11-2022 to 30-11-2022	D1	113.5 mg/m^2/day
		D2	54.4 mg/m^2/day
		D3	27.2 mg/m^2/day
Q1 2023	01-03-2023 to 31-03-2023	D1	24 mg/m^2/day
		D2	21.4 mg/m^2/day
		D3	2.6 mg/m^2/day
Q2 2023	01-06-2023 to 30-06-2023	D1	235.6 mg/m^2/day
		D2	169.5 mg/m^2/day
		D3	256.1 mg/m^2/day
Q3 2023	01-09-2023 to 30-09-2023	D1	314.1 mg/m^2/day
		D2	203.7 mg/m^2/day
		D3	178.3 mg/m^2/day
Q4 2023	01-11-2023 to 30-11-2023	D1	8.5 mg/m^2/day
		D2	25.4 mg/m^2/day
		D3	12.4 mg/m^2/day
Q1 2024	01-01-2024 to 30-01-2024	D1	13.3 mg/m^2/day
		D2	54.4 mg/m^2/day
		D3	19.5 mg/m^2/day

Q2 2024	01-05-2024 to 31-05-2024	D1	183.8 mg/m^2/day
		D2	187.5 mg/m^2/day
		D3	19.3 mg/m^2/day
Q3 2024	01-09-2024 to 30-09-2024	D1	28.6 mg/m^2/day
		D2	65.7 mg/m^2/day
		D3	113.7 mg/m^2/day
Limit			**350 mg/m^2/day**

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Table 8.3 Dust Deposition Monitoring Survey Results at Kilchreest Quarry

8.3.3 Prevailing Meteorological Conditions

Meteorological conditions such as rainfall, wind speed and wind direction have the greatest impact on potential dust deposition impacts in proximity to the Quarry site.

The closest representative Met Eireann weather station data to Quarry site is located at Athenry. Athenry Weather Station is situated within the grounds of Teagasc, Athenry, Co Galway [Location - 53°17'21" N, 08°47'08'' W, 40m above mean sea level]. The station was installed in 2010. The parameters currently recorded include Air Temperature, Soil Temperatures, Earth Temperature, Grass Temperature Wind speed and direction, Rainfall, Atmospheric Pressure, Relative Humidity and Global Radiation.

Meteorological data for the Athenry weather station from within the last 10 years has been obtained in accordance with best practise. The Athenry weather station is located ~14 Km north of the Quarry site and has been used for wind speed, wind direction and rainfall data.

Table 8.4 summarises the monthly rainfall and wind speed values from January 2020 to October 2024. This data exhibits a relatively high rainfall level throughout the year (Long Term Average 109.7 mm / month), which acts as a significant natural dust suppressant on site

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Date	Monthly Average Rainfall (mm)	Monthly Average Wind Speed (m/s)
Jan-20	118.7	7.9
Feb-20	248.5	10.9
Mar-20	108.2	8.4
Apr-20	46.8	6.4
May-20	49.6	7
Jun-20	67.9	7.4
Jul-20	174.3	7
Aug-20	109.8	6.3
Sep-20	90.3	6.9
Oct-20	168	8.1
Nov-20	148.1	7.2
Dec-20	151.6	7.6
Jan-21	167.3	6.2
Feb-21	113.4	9.1
Mar-21	102.1	8
Apr-21	23.9	6.3
May-21	95.7	6.8
Jun-21	29.8	6.3
Jul-21	58.5	4.9
Aug-21	84.8	5.6
Sep-21	91.1	5.3
Oct-21	164	6.3
Nov-21	78.9	6.6
Dec-21	114.7	7.4
Jan-22	56.9	6.6
Feb-22	143.1	10.4
Mar-22	39	6.6
Apr-22	51.6	7.1
May-22	78.9	7.6
Jun-22	79.4	7.3
Jul-22	66	5.7
Aug-22	79.6	5.7
Sep-22	114.2	5.8
Oct-22	199.3	7.7
Nov-22	156.2	7.5
Dec-22	114.3	5.8
Jan-23	113.9	7.2
Feb-23	42	7.7
Mar-23	185.9	7.4
Apr-23	93.4	7.1
May-23	63.5	5.9
Jun-23	93.8	6.1

Jul-23	224.1	6.9
Aug-23	129.1	6.8
Sep-23	148.2	6.1
Oct-23	179.9	6.2
Nov-23	113.5	6.8
Dec-23	202.9	8.8
Jan-24	92.4	6.9
Feb-24	159.1	7.9
Mar-24	130.5	8
Apr-24	100.7	7.9
May-24	59	5.9
Jun-24	58.9	6.6
Jul-24	71.5	5.9
Aug-24	159	7.6
Sep-24	46.6	6.5
Oct-24	112.7	6.7
Average	**109.7**	**7.01**

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Table 8.4 Monthly Average Rainfall and wind Speed Values for Met Eireann weather Station at Athenry from 2020 to October 2024

The wind direction in the west of Ireland is primarily from a south-westerly direction, which is represented in the windrose from Athenry as shown in Figure 8.3

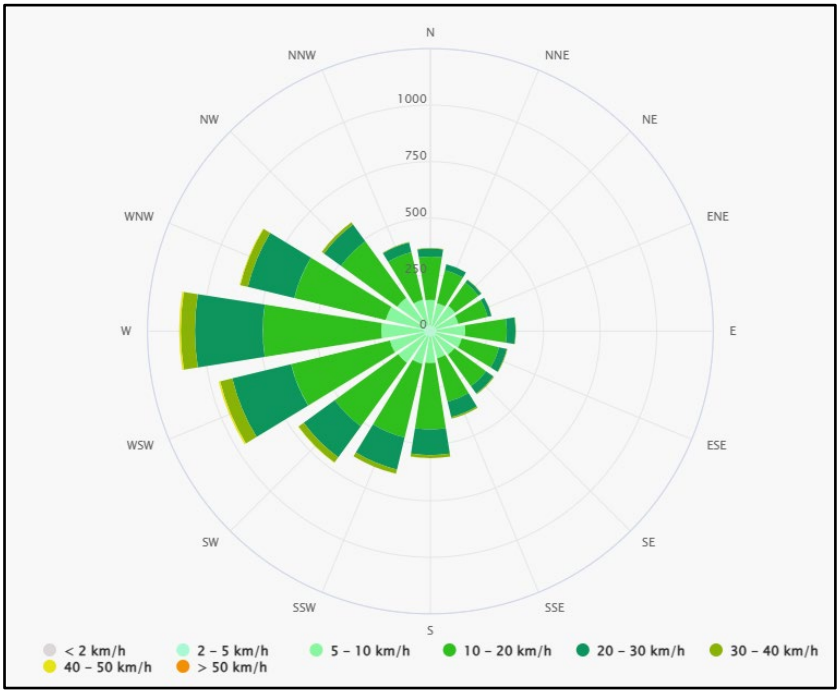

Figure 8.3 Windrose for Athenry (Wind 'Blowing From' Direction. I.E. Prevailing Westerly-South-Westerly Wind Direction) (Source Meteoblue.com)

The highest potential for dust dispersal and deposition occurs on dry windy days and the risk of dust deposition at a particular location is determined by the frequency of these dry winds

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blowing towards them from a dust generating activity. In the guidance 'The Environmental Effects of Dust from Surface Mineral Workings' published in 1995 by the DoE (now part of DEFRA) together with guidance in MPS2, it is generally accepted that wind blow of dust does not occur on days when rainfall volumes are greater than 0.2 mm.

The Athenry weather station data has been analysed in order to quantify the number of dry working days in which the wind direction is in a particular sector, as exhibited in Figure 8.4. Analysis of the information from the Athenry weather station is detailed in Table 8.5.

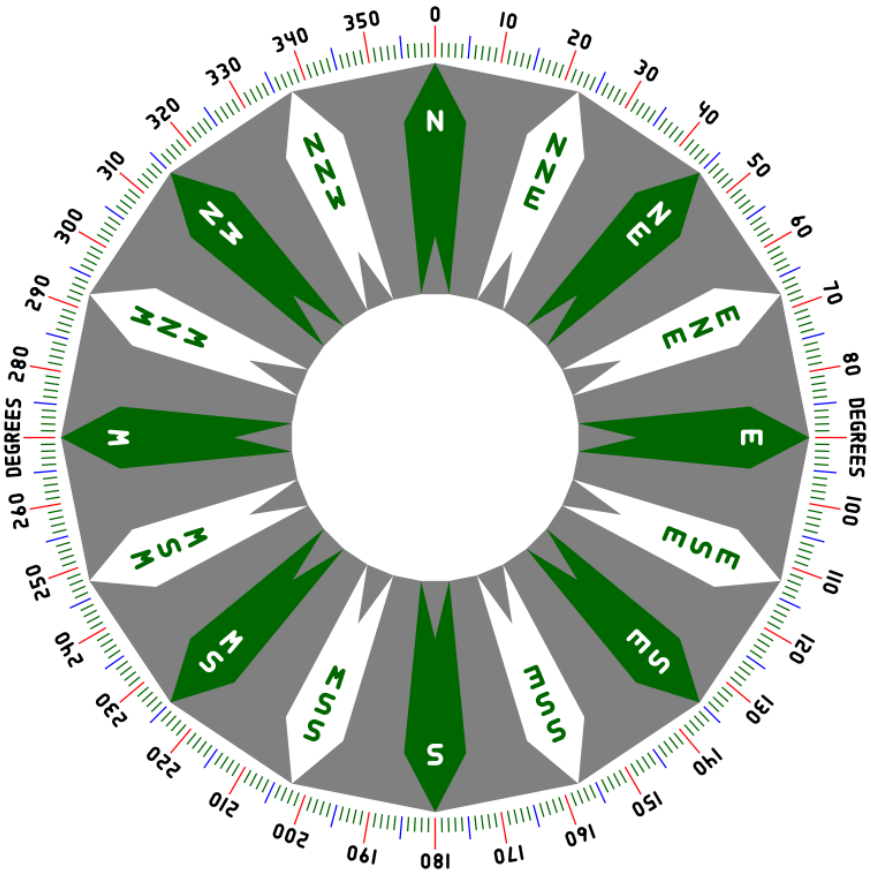

Figure 8.4 Relevant Wind Directions Exhibited by 16-point compass card

Wind Direction	Total Frequency of Occurrence – Wind Direction (%)	Frequency of Occurrence – Wind Direction >5m/s (11 Knots) (%)
North	4.63	0.90
North-north-east	4.71	0.75
East-north-east	3.03	0.63
East	4.18	1.03
East-south-east	11.99	2.84
South-south-east	11.18	4.71
South	8.20	3.00
South-south-west	8.72	3.74
West-south-west	13.74	7.18
West	13.23	5.90
West-north-west	8.51	3.00
North-north-west	6.62	1.22
Calm/Variable	98.75	-

Table 8.5 Percentage Frequency of Wind Direction in all Compass Sectors

Wind direction determines the sector of the compass into which the potential dust emission is dispersed. The predominant wind direction is from the West-south-west to the west as shown in Table 5. Wind speed determines the potential distance of dispersal, the potential volume of displaced dust and the potential size of particles mobilised. The number of days that rainfall has been determined to be less than 0.2 mm (over a 4.8-year average, 2020 – October 2024) = 123.5 days per year (See Appendix A).

The meteorological data from Athenry has been analysed in order to quantify the number of dry days combined with prevailing wind direction. The information has been adapted to allow for assumed working days, i.e. 7 days per week, 52 weeks per year, on days where rainfall is less than 0.2 mm. Therefore, this dust assessment considers includes an average of all days with rainfall less than 0.2 mm per annum.

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Wind Direction	Frequency of Occurrence %
North	5.7
North-north-east	5.8
East-north-east	3.7
East	5.2
East-south-east	14.8
South-south-east	13.8
South	10.1
South-south-west	10.8
West-south-west	17.0
West	16.3
West-north-west	10.5
North-north-west	8.2
Calm/Variable	0

Table 8.6 Percentage Frequency of Wind Direction in all Compass Sectors

The relevant guidance confirms that dust is not likely to be carried by winds of less than 5.6 m/s (11 knots) and therefore, provides a cut-off point with wind speeds below which disamenity dust impact will not occur. An assessment of the likelihood of a dust occurrence is presented in Table 8.7.

Wind Direction	No. of Dry Windy Working Days per annum	Dry Working Days as % of the Total Number of Dry Working Days per year (97)
North	1.1	0.90
North-north-east	0.0	0.03
East-north-east	0.0	0.02
East	0.0	0.03
East-south-east	0.3	0.28
South-south-east	0.5	0.43
South	0.2	0.20
South-south-west	0.3	0.26
West-south-west	1.0	0.80
West	0.8	0.63
West-north-west	0.3	0.21
North-north-west	0.1	0.07
Calm/Variable	0.0	0.0

Table 8.7 Categorisation of Frequency of Potentially Dusty Winds

8.4 PREDICTED IMPACTS FROM THE PROPOSED DEVELOPMENT

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The assessment to consider the dust dispersion impacts that can be expected to occur in the future as a result of the quarry site including the extraction of limestone using conventional drilling and blasting techniques and mineral reduction using mobile crushing and screening is outlined below. This considers the significant effects, or impacts, that can reasonably be expected to occur as a result of quarrying.

Wind speed and direction have the greatest potential impact on dust deposition impacts in proximity to the site. The predominant wind direction is from the west to south-west, with winds from the west to south-west direction occurring most frequently. The closest properties directly to the north-east of the site, i.e. downwind of the prevailing wind direction are >1 Km from the quarry site and therefore, are highly unlikely to experience a dust nuisance impact at such a distance downwind.

8.4.1 Dust Sensitive Receptors

The magnitude of the potential impact has been assessed for all nearby potentially sensitive receptors. This assessment was based on the following:

- Nearby potentially sensitive receptors are naturally screened by existing topography;
- The proposed development of the quarry, includes the establishment of perimeter earth berms and quarry faces which will reduce the potential for wind-blown dusts off site;
- The development of the quarry method of working into the quarry faces will continue to create a barrier for potential dust migration to nearby receptors; and
- Dust management methods will be employed on site and maintained.

The nearest Dust Sensitive Receptors (DSR) in proximity to the quarry site are as follows;

- DSR 1 - ~108m south of the proposed extraction area (151994, 212782).
- DSR 2 - ~110m south of the proposed extraction area (152280, 212954).
- DSR 3 - ~200m southeast of the proposed extraction area (152397, 213035).
- DSR 4 - ~1100m northeast of the existing quarry (152372, 214374).
- DSR 5 - ~885m northwest of the proposed site access road (151254, 213842).

Of the five nearest representative sensitive receptor properties surrounding the planning application area, three are located within 400m of proposed quarry operations. The nearest sensitive receptor property is located ~108m south of the proposed extraction area. Each receptor chosen is considered to illustrate the worst-case scenario relative to the wind

direction and proximity to proposed dust generating activities. The residential receptors located in excess of 400m from the quarry (DSR 4 and DSR 5) have been included in the assessment to represent receptors downwind and cross wind of the prevailing wind direction, although beyond 250m it is highly unlikely that these receptors will experience a dust nuisance.

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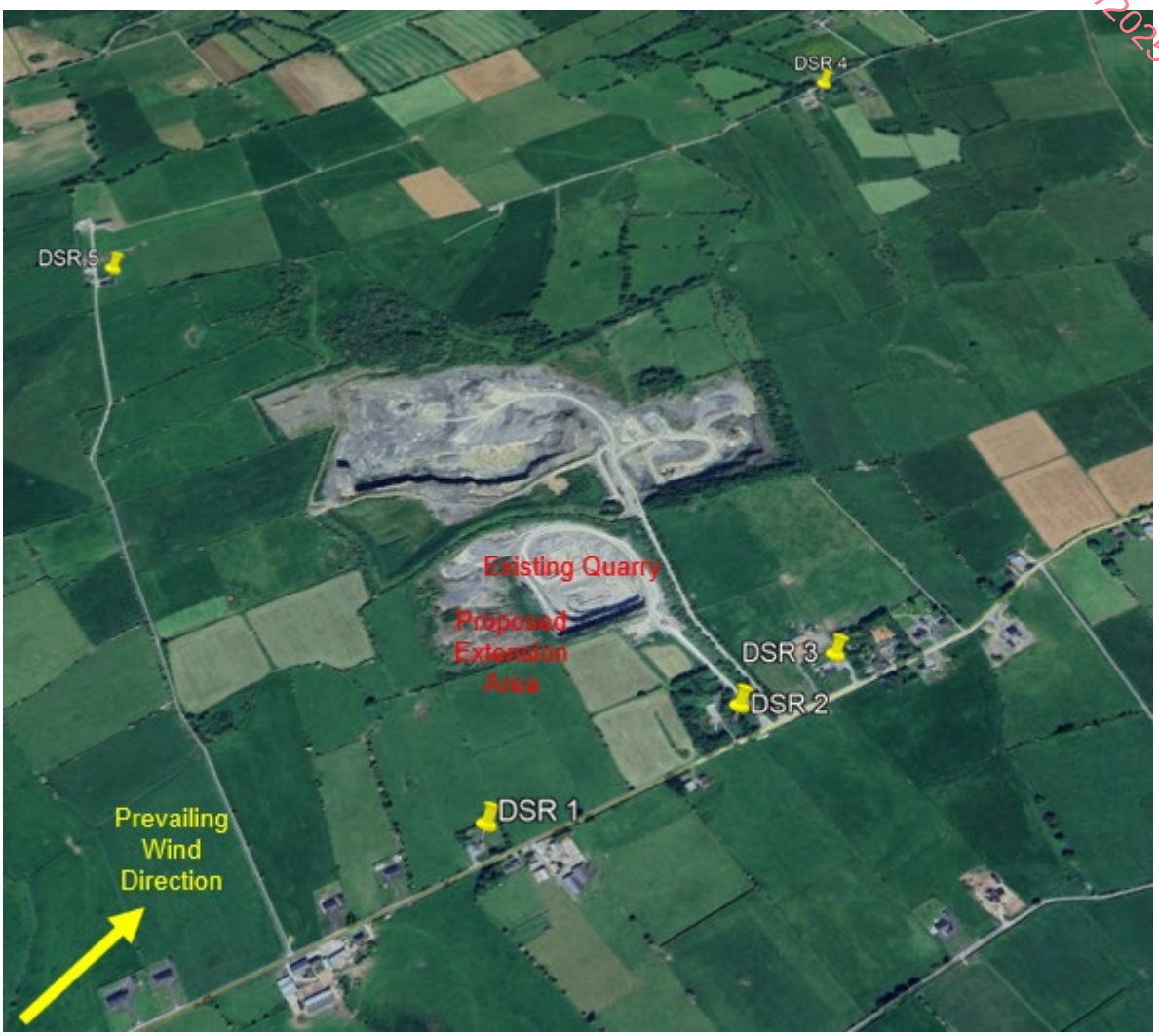

Figure 8.5 Nearest Dust Sensitive Receptors (DSR) in Proximity to the Quarry Site

8.4.2 Dust Impact on Ecological Receptors

The potential effects on ecological receptors resulting from the predicted dust impact must be assessed. An 'ecological receptor' refers to any sensitive habitat affected by dust deposition. This includes the direct impacts on vegetation or aquatic ecosystems, and the indirect impacts on fauna (e.g. on foraging habitats).

For locations with a statutory designation, e.g. Special Areas of Conservation (SACs) and Sites of Special Scientific Interest (SSSIs), consideration should be given as to whether the particular site is sensitive to dust and this will depend on why it has been designated. Some non-

statutory sites (i.e. local wildlife sites) and/or locations with very specific sensitivities may also be considered if appropriate.

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If there are relevant ecological receptors within 250m or 400m (depending on the rock type) then an assessment of the ecological effects resulting from the predicted dust impact is required.

There are no sensitive habitats in close proximity to the quarry with the Slieve Aughty SPA located 2.7 km south-east of the proposed development and Peterswell turlough SAC located 2.8 km south-west of the proposed development. Therefore, no further assessment of the potential ecological effects resulting from the predicted dust impact is required.

8.4.3 Potential Dust Impact from Proposed Activities

The following aspects of the proposed development have been identified that could possibly give rise to an impact on the air quality environment of the surrounding area:

- Drilling / blasting, Excavation of mineral and processing;
- Loading and despatch of vehicles;
- On-site transportation of material; and,
- Overburden stripping and material placement and Restoration.

The inherent mitigation factors have also been examined in the following sections:

- **Drilling / blasting, Excavation of mineral and processing**

The operational methodology within the proposed quarry site will follow a typical methodology within a quarry. The extraction of mineral using conventional drilling and blasting techniques, as required, and extraction using mobile excavator with associated HGV traffic movements as per the proposed rates of extraction will result in a potential for dust deposition in proximity to the quarry site.

The blasted rock will be processed on the quarry floor using mobile crushing and screening plant to produce a range of aggregate sizes. This plant is fully mobile and able to operate on any standard bench; thus, removing the requirement for the blast rock to be hauled elsewhere within the quarry, or off-site for processing. The modern mobile plant will be fitted with dust suppression units and enclosures of all potential emission points. As the quarry deepens, the quarry faces will provide additional attenuation in terms of dust generated by the processing plant.

Processed material will be stockpiled on the quarry floor prior to being loaded into HGV's for dispatch off-site.

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- **Loading and despatch of vehicles; and onsite transportation of material**

Material will be liberated at the face via drill and blast technology. Material in the blast pile will be loaded into the mobile processing equipment via a tracked face excavator, crushed and screened before being transported from the quarry void. The mobile plant on site will include excavators, crushers and screeners, trucks and wheeled loading shovels.

The number of haul truck movements from the quarry face will be approximately 4 movements per hour. The weight of vehicles, their speed and the number of wheels in contact with the ground can all affect the resuspension of dust deposits on road surfaces. Strict site speed limits will be enforced (10kph) to minimise dust generation. Dust control measures will be implemented on site for the control of dust during prolonged dry periods and will be reflected in the Dust Management Plan. This includes for the dampening of the haul routes using a water bowser as necessary. The implementation of such mitigation measures in accordance with best practice will take place at the Quarry site.

- **Restoration**

Following the completion of mineral extraction, the site will be restored in accordance with the submitted restoration concept. The application area will be restored to a natural habitat which is one of the beneficial after uses listed in the EPA Guidelines "Environmental Management in the Extractive Industry" (2006). Where feasible, restoration of exhausted and redundant areas will be carried out at the earliest opportunity. However, it is envisaged that the majority of restoration proposals will be carried out after extraction operations at the site have ceased.

Following the cessation of operations at the site, all vehicles, plant and equipment related to the proposed development will be removed.

8.5 ASSESSMENT OF POTENTIAL DUST IMPACTS

An Operational Dust Impact Assessment has been undertaken with reference to the IAQM Guidance on the Assessment of Mineral Dust Impacts for Planning (May 2016, v 1.1).

Estimation of Dust Impact Risk

Estimation of Residual Source Emissions

The Dust Impact Risk was determined for each of the main operational activities:

a. Site preparation and restoration;

b. Mineral extraction;

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c. Materials handling;

d. On-site transportation;

e. Mineral processing;

f. Stockpiles and other exposed surfaces;

g. Off-site transportation (track-out).

More than one of these activities may occur at any one time, and this was taken into consideration in the assessment. The Residual Source Emissions was based on the scale of the anticipated operations and was classified as Small, Medium, or Large for each relevant operational activity in each phase, taking into account the designed-in mitigation. The Residual Source Emissions for each activity are presented in Table 8.8.

Activity	**Residual Source Emissions**	**Notes**
Site preparation and restoration	Large	Application area is 12.66ha, bunds ~2.5m in height, >100,000m^3 material movement.
Mineral extraction	Small	Extraction area is 7.5ha, hydraulic excavator, drilling and blasting every 3-4 months, material of high dust potential, ~120,000 tpa extraction rate
Materials handling	Medium	<5 plant operating <50 m of a site boundary within the quarry transferring material of a high dust potential on hard standing haul roads.
On-site transportation	Medium	~20-40 movements per day, haul roads >500m in length on unpaved surfaces of potentially dusty material
Mineral processing	Medium	Mobile Crusher and Screener, <200,000 tpa of material with a high dust potential and/or low moisture content
Stockpiles and other exposed surfaces	Medium	Stockpile duration of ~2 month. Material with a high dust potential and/or low moisture content, located <100 m from the site boundary
Off-site transportation	Small	~23 movements per day, paved surfaced site access road >50 m in length, with effective HDV cleaning facilities and procedures

Table 8.8 Residual Source Emissions Classification

Dust Sensitive Receptors

The IAQM Guidance on the Assessment of Mineral Dust Impacts for Planning presents the following categorisation of frequency of potentially dusty winds and categorises receptor distance from source as distant, intermediate or close as displayed below:

Frequency Category	Criteria
Infrequent	Frequency of winds (>5 m/s) from the direction of the dust source on dry days are less than 5%
Moderately frequent	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are between 5% and 12%
Frequent	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are between 12% and 20%
Very frequent	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are greater than 20%

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Table 8.9 Categorisation of Frequency of potentially Dusty Winds

The categorisation shown in Table 8.10 was applied to the distance from each receptor to the proposed area of extraction.

Category	Criteria
Distant	Receptor is between 200 m and 400 m from the dust source
Intermediate	Receptor is between 100 m and 200 m from the dust source
Close	Receptor is less than 100 m from the dust source

Table 8.10 Categorisation of receptor Distance From Source

The site-specific factors considered to determine the Effectiveness of the Pathway were the distance and direction of receptors relative to the prevailing wind directions. There are 3 dust sensitive receivers/houses identified within 400m of the extraction area boundary, DSR 1, DSR 2 and DSR 3 (See Figure 10.3). As stated in the IAQM guidance (Box 2) "*From the experience of the Working Group, adverse dust impacts from sand and gravel sites are uncommon beyond 250 m and beyond 400 m from hard rock quarries measured from the nearest dust generating activities. In the absence of other information it is commonly accepted that the greatest impacts will be within 100 m of a source and this can include both large (>30 µm) and small dust particles.*"

DSR 4 and DSR 5 is >400m from dust generating activities at a distance of approximately 885m and 1100m respectively from the site boundary. However, considering their location crosswind and downwind of the prevailing winds it is possible that these receptors may experience a dust nuisance and they have been considered further in this assessment as a worst case scenario. Any properties at a greater distance would therefore be less likely to be subject to disamenity dust.

The pathway effectiveness was classified using the Frequency of Potentially Dusty Winds from Table 8.9 and the Receptor Distance from Source from Table 8.10, as shown in Table 8.11.

		Frequency of potentially dusty winds			
		Infrequent	**Moderately frequent**	**Frequent**	**Very frequent**
Receptor Distance Category	Close	Ineffective	Moderately Effective	Highly Effective	Highly Effective
	Intermediate	Ineffective	Moderately Effective	Moderately Effective	Highly Effective
	Distant	Ineffective	Ineffective	Moderately Effective	Moderately Effective

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Table 8.11 Pathway Effectiveness

The results of which are presented for each receptor location in Table 8.12.

Receptor	Location relative to nearest dust source	Pathway Effectiveness
DSR 1 Note 1	~108m south of the proposed extraction area	Ineffective
DSR 2 Note 2	~110m south of the proposed extraction area	Ineffective
DSR 3 Note 3	~200m southeast of the proposed extraction area	Ineffective
DSR 4 Note 4	~1100m northeast of the existing quarry	Ineffective
DSR 5 Note 4	~885m northwest of the existing quarry	Ineffective

Table 8.12 Pathway Effectiveness at Sensitive Receptors

Note 1 – DSR 1 is the property ~108m south of the proposed site access road (151994, 212782), making it an **Intermediate** receptor. Winds from the north-north-west, north, north-north-east & east-north-east would blow from the site towards this receptor location. A total of 1.2 dry windy working days are calculated from Table 10.6, 1.02% of all dry working days. Table 10.11 would classify the potential for dusty winds as **Infrequent**.

Note 2 – DSR 2 is the property ~110m south of the proposed extraction area (152280, 212954), making it an **Intermediate** receptor. Winds from the north, north-north-west, west-north-west & west would blow from the site towards this receptor location. A total of 2.3 dry windy working days are calculated from Table 6, 1.81% of all dry working days. Table 11 would classify the potential for dusty winds as **Infrequent**. Note this property is currently derelict.

Note 3 – DSR 3 is the property ~200m southeast of the proposed extraction area (152397, 213035) making it an **Intermediate** receptor. Winds from the west-north-west, west & west-south-west would blow from the site towards this receptor location. A total of 2.1 dry windy working days are calculated from Table 6, 1.64% of all dry working days. Table 11 would classify the potential for dusty winds as **Infrequent**.

Note 4 – DSR 4 is the property ~1100m northeast of the existing quarry (52372, 214374), making it a **Distant** receptor. Winds from the south- south-west, would blow from the site towards this receptor location. A total of 0.3 dry windy working days are calculated from Table 6, 0.26% of all dry working days. Table 11 would classify the potential for dusty winds as **Infrequent**.

Note 5 – DSR 5 is the property 885m northwest of the proposed site access road (151254, 213842), making it a **Distant** receptor. Winds from the south- south-east, would blow from the site towards

this receptor location. A total of 0.5 dry windy working days are calculated from Table 6, 0.43% of all dry working days. Table 11 would classify the potential for dusty winds as **Infrequent**.

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Estimation of Dust Impact Risk

The Residual Source Emissions from Table 8.8 and the Pathway effectiveness (Table 8.12) are combined to predict the Dust Impact Risk as shown in Table 8.13.

		Residual Source Emission		
		Small	**Medium**	**Large**
Pathway Effectiveness	Highly Effective Pathway	Low Risk	Medium Risk	High Risk
	Moderately Effective Pathway	Negligible Risk	Low Risk	Medium Risk
	Ineffective Pathway	Negligible Risk	Negligible Risk	Low Risk

Table 8.13 Descriptors for Magnitude of Dust Effects

Estimate Likely Magnitude of Disamenity Effects

The likely disamenity effect at each receptor is determined from the Dust Impact Risk (Table 13) and the Receptor Sensitivity, as shown in Table 8.14.

For the purpose of identifying receptor sensitivity, the IAQM 2016 guidance suggests that residential dwellings should be classed as high sensitivity receptors.

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

Table 8.14 Dust Disamenity Effects at Specific Representative Receptors

The dust disamenity effects predicted at each receptor around the minerals development was summarised in a table setting out the risks of impacts for each activity being assessed; as illustrated in Table 8.15.

Table 8.15 shows the Magnitude of Dust Effect at each receptor due to '*Site Preparation and Restoration'* where the residual source emissions was categorised as 'Large'.

Table 8.16 shows the Magnitude of Dust Effect at each receptor due to the remaining quarrying activities which are likely to occur concurrently with each other and classified as 'Medium'.

The Dust Disamenity Effects at the Specific Representative Receptors for these activities is shown in Tables 8.15 and 8.16.

Ref.	Location relative to nearest dust source	Residual Source Emissions	Pathway Effectiveness	Dust Impact Risk	Receptor Sensitivity	Magnitude of Dust Effect
DSR 1	~180m	Large	Ineffective	Low Risk	High	Slight Adverse Effect
DSR 2	~110m	Large	Ineffective	Low Risk	High	Slight Adverse Effect
DSR 3	~200m	Large	Ineffective	Low Risk	High	Slight Adverse Effect
DSR 4	~1100m	Large	Ineffective	Low Risk	High	Negligible Effect
DSR 5	~885m	Large	Ineffective	Low Risk	High	Negligible Effect

Table 8.15 Dust Disamenity Effects at Specific Representative Receptors During *'Site Preparation and Restoration'*

Ref.	Location relative to nearest dust source	Residual Source Emissions	Pathway Effectiveness	Dust Impact Risk	Receptor Sensitivity	Magnitude of Dust Effect
DSR 1	~180m	Medium	Ineffective	Negligible Risk	High	Negligible Effect
DSR 2	~110m	Medium	Ineffective	Negligible Risk	High	Negligible Effect
DSR 3	~200m	Medium	Ineffective	Negligible Risk	High	Negligible Effect
DSR 4	~1100m	Medium	Ineffective	Negligible Risk	High	Negligible Effect
DSR 5	~885m	Medium	Ineffective	Negligible Risk	High	Negligible Effect

Table 8.16 Dust Disamenity Effects at Specific Representative Receptors During All Other Operational Quarrying Activities

Tables 8.15 and 8.16 present a summary of the assessment of dust effects in accordance with the guidance contained in the IAQM Guidance on the Assessment of Mineral Dust Impacts for Planning. As presented in Table 15, the impact on air quality from potential dust emissions during '*Site Preparation and Restoration'* is expected to have a 'slight adverse effect' at receptors DSR 1, DSR 2 and DSR 3 located in proximity to the Quarry site. Given the distance to DSR 4 and DSR 5, a negligible effect will occur.

As presented in Table 8.16, the impact on air quality from potential dust emissions during during all other operational quarrying activities is expected to have a 'negligible effect' at receptors DSR 1, DSR 2, DSR 3, DSR 4 and DSR 5.

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Overall, these effects are considered to be 'not significant'. This is based on a consideration of the different magnitude of effects at individual receptors, and the number of receptors that would experience these different effects.

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Likely Magnitude of Effects at Ecologically Designated Sites

There are no designated ecological sites in close proximity to the proposed Quarry site. Slieve Aughty Mountains SPA (Site Code: 004168) is located 2.7 km south-east of the proposed development and Peterswell turlough SAC located 2.8 km south-west of the proposed development. Therefore a disamenity dust impact assessment is not required for these receptor locations.

8.6 ASSESSMENT OF POTENTIAL AIR QUALITY IMPACTS

The EPUK & IAQM Land-Use Planning & Development Control: Planning For Air Quality (2017) outlines indicative criteria for requiring an air quality assessment of traffic related emissions, as shown in Table 8.17.

The development will:	**Indicative Criteria to Proceed to an Air Quality Assessment**
1. Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors. (LDV = cars and small vans 3.5t gross vehicle weight).	A change of LDV flows of: - more than 100 AADT within or adjacent to an AQMA - more than 500 AADT elsewhere.
2. Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors. (HDV = goods vehicles + buses >3.5t gross vehicle weight).	A change of HDV flows of: - more than 25 AADT within or adjacent to an AQMA - more than 100 AADT elsewhere.

Table 8.17 Extract From EPUK & IAQM Land-Use Planning & Development Control Planning For Air Quality (2017) Table 6.2 Indicative Criteria For Requiring An Air Quality Assessment

Therefore, because the development will cause no significant change in traffic flows, i.e. <500 Light Duty Vehicle (LDV) per day, and/or <100 HGVs per day, on local roads adjacent to relevant receptors, there is no requirement for an air quality Screening Method assessment to be undertaken to predict the relative impact on local air quality.

8.7 MITIGATION MEASURES

The following dust mitigation measures are to be employed to minimise operational dust impacts. The aim of these mitigation measures is to minimise the release of dust to the environment. Outlined in detail below are the dust suppression measures which will be employed at the Quarry site.

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8.7.1 Operating and Dust Mitigation Measures

The site manager has overall responsibility for ensuring that operations within the Quarry site comply with the requirements of any planning authorisation. The site will have at its disposal a suitable water bowser and associated water supply to allow for dampening down of the site when windblown dust from its surface arises. The occurrence of potential wind-blown dust is weather dependent but suitable facilities are available to minimise windblown dust from the site surfaces. Dust controls measures will be clearly defined in terms of roles and responsibilities within the Environmental Management Plan, which will be operated and adhered to at the Quarry site.

8.7.2 Access Roads, Site Roads and Vehicles Loading Activities & Movements

The objective of these procedures is to minimise the creation and release of dust generated by transportation activities carried out during both access to and movements within the site. This includes minimising dust from transport vehicles entering and leaving the facility.

- Regular attention will be paid to cleaning dust material from all roadways, hard surfaced areas and working areas of the facility. Dust from cleanup will be re-incorporated into the stockpile. This will be done during every lull in operations and at the end of each working period.
- Roadways and other areas where vehicles are regularly moving will be kept clean, by sweeping or by wetting;
- When loading vehicles, the following procedures will be adhered to:
  - No overloading of vehicles or containers resulting in either peaks of cargo or overspill onto the working areas or roadways.
  - Keep fall heights of the material into the transport vehicles to a minimum.
- Strictly applied, suitable on-site speed limits will be set, displayed and observed for the movement of all vehicles (10 kph)
- A suitable underbody and wheel wash will be provided. This will be surrounded by a smooth hard surface extending to the site exit. All vehicles will pass through and spend sufficient time for effective cleaning in the washing facility before leaving the site. Supervision will be provided to ensure that this is carried out effectively.

8.7.3 Stockpiling Operations

The aims of these procedures will be to ensure that materials are stockpiled only within the designated process working areas and any release of dust to atmosphere is minimised.

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- Stockpiling and offloading operations to the processing plant and equipment will be co-ordinated in such a way as to minimise the potential for double handling of material.
- Unloading of materials within the facility will be carefully planned to ensure minimum exposure to winds, thereby reducing dust emission to air.
- The aims of the stockpiling procedure will be to ensure that management of the stockpile is conducted in such a way that releases of dust to atmosphere are minimised.
- Stockpile areas will be clearly and physically delineated to deter vehicles from running over mineral extract at the stock edge.
- Stockpiles will be managed to ensure that the profile of material will minimise wind whipping.
- During any stockpiling, stockpiles will be profiled and compacted by flattening out peaks and ridges and when partially worked, will be re-contoured to prevent ridges or overhanging falls.
- Whenever possible, settled stockpiles will be not be broken into when the wind is likely to lift newly exposed dry dust. When this is unavoidable, effective dust control methods will be implemented.
- Prior to carrying out any stock handling operations, the dust suppression equipment will be checked to ensure that it is working properly.

8.7.4 Monitoring & Reporting

- A high standard of housekeeping will be maintained on site.
- Systems for monitoring processes, responding to and reporting pollution incidents will be devised. This information will be kept in a logbook, together with information regarding equipment failure, periods of significant dust emissions off-site and the inspection of roadways, together with any remedial action taken.
- Any complaints received from neighbouring properties will be logged and appropriate actions taken to reduce the potential for further complaint.

8.8 ASSESSMENT OF IMPACTS AGAINST LIKELY EVOLUTION OF BASELINE SCENARIO

In terms of the likely evolution of the baseline, two scenarios have been identified: one is that the quarry continues to operate as it is at present, the impacts of this have been sufficiently considered in the above sections. The alternative baseline scenario is that the existing quarry site is restored and remediated. In this instance, there would be short term impacts associated with the restoration

of the quarry, following which, all activity at the site would cease and dust generation (and associated impacts) would be negligible.

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When assessing the proposed development against the alternative baseline scenario, the proposed future development of the quarry site would result in potential dust impacts which otherwise would not be experienced. However, given the predicted 'not significant' dust impact in proximity to the site and the fact that any future development at the site will be required to be undertaken in accordance with the mitigation measures outlined, the proposed development is not considered to result in any significant effects upon the environment.

8.9 DECOMMISSIONING IMPACTS

Should existing quarrying operations on the site cease, any potential dust from de-commissioning of the building structures in the southern area of the Quarry site and / or the regrading of the benches in the extraction area and subsequent infill with groundwater will be short-term dust impacts. Such activities may include building demolition, overburden removal, bund de-construction, restoration works, de-commissioning of plant and equipment, etc.

8.10 MONITORING

Dust monitoring will continue to be carried out on a quarterly basis at suitably agreed monitoring locations. If the level of dust is found to exceed the dust deposition limits of 350 mg/m^2/day at the perimeter of the site, immediate action will be taken and additional mitigation measures will be incorporated to control any dust emission.

8.11 CONCLUSIONS

The potential for any dust arising from the proposed mineral extraction using conventional drilling and blasting techniques and mineral reduction using mobile crushing and screening with associated HGV traffic movements at the Quarry site has been assessed.

It is predicted that the potential for nuisance impact has been and is limited to the immediate vicinity of the existing activities. The potential for nuisance dust impacts is considered to be 'slight adverse' to 'negligible' at the nearest sensitive receptors, i.e. a 'not significant' impact.

Dust deposition monitoring will continue to be undertaken to confirm that future quarrying and associated operations will result in dust deposition rates that are maintained below the recommended dust deposition limit value of 350 mg/m^2/day at all monitoring locations, as outlined in the DOEHLG 2006 guidance.

Any residual dust deposition impacts resulting from the future de-commissioning and restoration of the quarry will be of a short duration and all potential dust impacts from the Quarry site are considered to be reversible i.e. the risk of impact will cease on completion of quarrying and restoration of the site.

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CHAPTER 9

CLIMATE

9. CLIMATE

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9.1 INTRODUCTION

This climate impact assessment has been prepared to accompany a planning application, which seeks permission for the continuation and extension of the existing quarry in the townland of Isertkelly North, Kilchreest, Loughrea, Co. Galway.

The lands proposed for the extraction of limestone is accessed via a private road and enters onto a local road which is an authorised access. The planning application boundary is 12.66 hectares with the proposal for extraction of limestone within c 7.5 hectares using conventional drilling and blasting techniques and mineral reduction using mobile crushing and screening. The quarrying excavation operation will progress in a westerly and southerly direction from the existing quarry boundary.

The proposed development will be a continuation of the current quarrying activity. There are no proposed amendments to the inputs, processes or outputs at the existing quarrying activity as part of this application, other than the proposed extension of the activity boundary and extraction areas. An extraction capacity of up to 120,000 tonnes per annum is sought to provide the applicant with the ability to respond to demand for aggregates in the region. . All existing prefabricated building are to be removed and replaced with a permanent office building which will contain offices, toilet, canteen etc. A new plant maintenance shed will also be constructed. Permission is sought for a period of 25 years in order to extract a known resource.

Climate is defined as an environmental factor under Directive 2011/92/EU, whilst Directive 2014/52/EU requires the vulnerability of a project to climate change to be addressed, particularly the risk of major accidents and/or disasters that are relevant to the project, including those caused by climate change.

The Intergovernmental Panel on Climate Change (IPCC 2021) define "*Climate in a narrow sense, as the average weather or more rigorously as the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands or millions of years. The classical period for averaging these variables is 30 years, as defined by the World Meteorological Organization (WMO). The relevant quantities are most often surface variables such as temperature, precipitation and wind. Climate in a wider sense is the state, including a statistical description, of the climate system.*"

In the context of this impact assessment, climate may refer to local climatological conditions (long-term weather patterns, e.g. local wind flow, temperature, rainfall or solar radiation) and particular "microclimate" effects of the project location (e.g. due to localised heat island effects, the effects of buildings / shade or coastal effects).

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Climate may also refer to the impact of the project in the context of greenhouse gas (GHG) emissions and potential effects associated with climate change. Determining whether a project will have a significant impact on current and future climate requires an understanding of the vulnerability of the project to climate change, the likely magnitude of GHG emissions associated with the activity as well as an understanding of the likely local impacts of climate change throughout the timescale of the project.

This Climate Impact Assessment report has been prepared by Mervyn Keegan to be included as a standalone section within the EIAR . Mervyn Keegan is a Director of the environmental consultancy, AONA Environmental Consulting Ltd. Mervyn Keegan's areas of professional expertise are in Noise Control & Acoustics and Air Quality & Odour consultancy. Mervyn Keegan has over 25 years of environmental consultancy experience. Mervyn is a full member of the Institute of Acoustics, the Institute of Environmental Sciences and the Institute of Air Quality Management. Mervyn has a Bachelor of Science Degree (Applied Sciences), a Master of Science Degree (Environmental Science) and a Diploma in Acoustics in Noise Control. AONA Environmental Consulting Ltd. is an independent consultancy specialising in Environmental Impact Assessment and Licensing. Mervyn Keegan has prepared in excess of ten Noise & Vibration and Air Quality impact assessments annually for quarry developments in the Republic of Ireland, Northern Ireland and the UK in the last 20 years and is an expert in the awareness and understanding of the relevant legislation and guidance that pertains to best practise in such assessments. Mervyn Keegan has appeared as an Expert Witness at oral hearings, public inquiries and legal hearings. Mervyn Keegan has produced Noise, Air Quality & Odour Impact Assessment reports to assess the impacts of a range of development types including roads, residential developments, industrial developments, quarries and mines and wind energy developments among others.

9.2 METHODOLOGY

This assessment has been made with guidance from the 'Guidelines on the information to be contained in environmental impact assessment reports', published by the EPA in May 2022. The guidelines were drafted by the EPA with a view to facilitating compliance with EIA Directive.

The objective of this assessment was to:

- Assess the prevailing climatic conditions of the development area on a local and regional level;
- Determine the impact, if any, of the development on the local microclimate and regional macroclimate;
- Determine any interaction between other aspects of the development and the climate of the area;

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- Estimate the developments GHG emissions; and
- Determine vulnerability of development to climate change.

The study of climate in respect of the proposed development was entirely a desktop study, involving the compilation and analysis of data and information on weather, climate, climate change, and impact of, and vulnerability to, climate change.

The principal sources of information include:

- Met Eireann;
- Environmental Protection Agency (EPA;
- Sustainable Energy Authority of Ireland SEAI);
- Intergovernmental Panel on Climate Change (IPCC); and
- European Union.

9.2.1 Impact Assessment Methodology and Significance Criteria

As identified above, the key objectives of this assessment are to assess:

- Impacts of climate change on the development, including the sensitivity, exposure and the overall vulnerability of the development to impacts from relevant climate hazards; and
- Impacts of the development on the climate.

The assessment of the development's vulnerability to climate change shall review published historical regional weather data to demonstrate the current climate impacts in the study area and will also consider any relevant events reported by site personnel.

Impacts of the development on climate will consider GHG emissions calculation for the project life cycle and other aspects of the development design that may impact emissions.

9.3 LEGISLATIVE POLICIES AND PLANS

Legislative references considered specifically for the assessment of climate from quarrying activities, and relevant statutory instruments in a planning context include:

- Directive 2014/52/EU of the European Parliament and of the Council, (amending Directive 2011/92/EU);
- European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018, S.I. 296 of 2018; and
- Planning and Development Regulations 2001 (as amended).

Relevant statutory instruments in the context of quarrying include:

- Mines and Quarry Act 1965, 7 of 1965

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9.3.1 Policies and Plans

9.3.1.1 National

Ireland is committed to achieving climate neutrality no later than 2050, with a 51% reduction in GHG emissions by 2030. These legally binding objectives are set out in the Climate Action and Low Carbon Development (Amendment) Act 2021. The Climate Act supports Ireland's transition to net-zero and the achievement of a climate neutral economy no later than 2050. It also establishes a legally binding framework with clear targets and commitments, to ensure the necessary structures and processes are in place to deliver our national, EU and international climate goals and obligations in the near and long term.

The Climate Action Plan 2024 (CAP24) set out an ambitious all-of-Government response to the challenges posed by climate change. This plan targets key economic and strategic areas and identifies actions required to enable the State to meet the 2050 targets. The plan outlines the current state of play across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and charts a course towards the decarbonisation targets.

The key sources of Ireland's overall GHG emissions in 2022 were agriculture (34.3%), transport (17.1%) and energy industries (14.8%). Estimates from the EPA indicate that Ireland's GHG emissions fell by 1.9% in 2022 compared to 2021, driven by higher fuel prices, reduced use of nitrogen fertiliser, increased renewable energy, behavioural change, and regulation. The plan acknowledges this reduction falls short of the level of abatement required to meet national and international targets. Further, corrective actions are included in Climate Action Plan 2024 in response to this.

The EU established an EU-wide Emissions Trading System (ETS) for certain high emitting sectors and separately set legally binding national targets for emissions reductions in non-ETS sectors. Within the ETS, participants are required to purchase allowances for every tonne of emissions emitted, with the amount of these allowances declining over time to ensure achievement of an EU-wide target of a 62% GHG emissions reduction by 2030, relative to 2005 levels. Ireland has 109 installations in the ETS sector. For non-ETS sectors, which includes emissions from agriculture, transport, buildings, and light industry, Member States' nationally binding targets (for the period 2021 to 2030) are covered by the Effort Sharing Regulation (ESR). Under the ESR, Ireland is required to reduce its emissions from these sectors by 42% by 2030, relative to 2005 levels. Together, the ETS and ESR will facilitate achievement of the EU-wide target of at least a 55% GHG emissions reduction by 2030 as set in the European Climate Law.

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9.3.1.2 County Galway

The Site is within the administrative boundary of Galway County Council (GCC). The Galway County Development Plan 2022-2028 (GCDP) acknowledges that mineral reserves are generally located within the rural area, and that the nature of the extractive industry is such that the industry must be developed where those resources occur. The Council will facilitate harnessing the potential of the area's natural resources while ensuring that the environment and rural and residential amenities are appropriately protected. The Council having regard to the substantial number existing number of quarries within the county has a preference for the continued sustainable extraction of these quarries over the development of new greenfield sites.

The Plan also recognises that the industry can have damaging environmental effects and states that the Council will take full account of the following DECLG guidelines Quarries and Ancillary Activities: Guidelines for Planning Authorities 2004 (including any updated/superseding document) and have regard to the protection of residential and natural amenities, the prevention of pollution and the safeguarding of aquifers and groundwater.

To ensure this, GCC notes that planning applications must account for potential environmental impacts as stated in their Mineral & Extraction Industry and Quarries Policy. To support the GCDP, GCC has adopted the following objectives in relation to climate within the extractive industry as follows:

MEQ 1: Aggregate Resources: Ensure adequate supplies of aggregate resources to meet future growth needs within County Galway and the wider region and to facilitate the exploitation of such resources where there is a proven need and market opportunity for such minerals or aggregates and ensure that this exploitation of resources does not adversely affect the environment or adjoining existing land uses**.**

MEQ 3: Sustainable Management of Exhausted Quarries: Encourage the use of quarries and pits for sustainable management of post recovery stage construction and demolition waste, as an alternative to using agricultural land, subject to normal planning and environmental considerations.

GCC has adopted policies in the GCDP in relation to the protection of climate. GCC objectives which are relevant to the climate assessment include:

CC2: Transition to a low carbon, climate-resilient society: It is a policy objective of the Planning Authority to support the transition to a competitive, low carbon, climate-resilient and environmentally sustainable economy by 2050, by way of reducing greenhouse gases, increasing renewable energy, and improving energy efficiency.

CC3: County Galway Climate Adaptation Strategy 2019-2024: To implement the County Galway Climate Adaptation Strategy 2019-2024 as appropriate.

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CC5: Climate Adaptation and Mitigation: To promote, support and direct effective climate action policies and objectives that seek to improve climate outcomes across County Galway through the encouragement and integration of appropriate mitigation and adaptation considerations and measures into all development and decision-making processes.

CC8 Climate Action and Development Location: To implement, through the plan and future local areas plans, policies that support and encourage sustainable compact growth and settlement patterns, integrate land use and transportation, and maximise opportunities through development location, form, layout and design to secure climate resilience and reduce carbon dioxide and greenhouse emissions.

9.3.2 Relevant Guidance

This assessment has been made with guidance from the 'Guidelines on the information to be contained in environmental impact assessment reports', published by the EPA in May 2022. Other guidance documents considered in this assessment include:

- Galway County Council; Climate Change Adaptation Strategy, 2024 – 2029
- Climate Action Plan, 2024
- Galway County Council, Local Authority Climate Action Plan, 2024 – 2029
- European Commission; Climate Change and Major Projects, 2016; and
- IEMA; Assessing Greenhouse Gas Emissions and Evaluating their Significance, 2017

9.4 BASELINE CONDITIONS

9.4.1 Existing Environment

The existing operational quarry has been in use since 2005. The Application Site comprises land currently used for quarrying activities and adjacent agricultural lands. A perimeter earthen berm will be constructed and seeded on the boundaries of the extension to screen the quarry workings from outside views. The lands surrounding the site to the south and west can be characterised as rural in nature, with land uses in the area being agricultural and single-house residential.

A long established Roadstone quarry is located c.60m north of the proposed development site and existing quarry boundary. This quarry has been in operation at this location for many decades. However, it has been closed since July 2024. The full quarry area covers c.20ha. with facilities associated with its operation including offices, weighbridge at the entrance to the site, with other associated manufacturing facilities including a concrete batching plant, block making plan and an asphalt/bitumen plant located towards the south and western areas of the wider quarry site. Processing of materials on site also takes place including crushing, screening and washing of aggregate. As the Roadstone quarry is currently closed and its reinstatement is unknown, the background air quality at present is most likely to be typical of

rural areas, being primarily influenced by the existing quarry activities associated with the proposed site, local traffic and agricultural activities, etc.

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9.4.1 Climate at The Site

The Irish climate is subject to strong maritime influences, the effects decreasing with increasing distance from the Atlantic coast. Winters tend to be cool, moist and windy, while summers are mostly mild, cloudy and less windy, when the depression track is further north and depressions less deep. For the greater part of the year, warm maritime air associated with the gulf stream helps to moderate the climate from the extremes of temperature experienced by many other countries at similar latitude.

The Atlantic circulation, which includes ocean currents such as the North Atlantic Current, moves heat northwards, which is then carried by the prevailing winds towards Ireland. The prevailing winds are westerly to south-westerly, and break on the hills and mountains of the west coast, which provide shelter from both the strong winds and from the direct oceanic influence. Rainfall is therefore a particularly prominent aspect of the climate in the west, with annual average precipitation highest on the west coast and in inland areas of high relief.

The climate in the area of the site is typical of the Irish 'temperate maritime climate'. The closest Met Eireann station is located at Athenry. Athenry Weather Station is situated within the grounds of Teagasc, Athenry, Co Galway [Location - 53°17'21" N, 08°47'08'' W, 40m above mean sea level]. The station was installed in 2010. This weather station is located ~14km north of the Quarry site. Monthly parameters recorded have been displayed in the accompanying Air Quality Chapter, these include average rainfall and wind speed and wind direction.

Recent extreme weather events have highlighted the vulnerability of individuals, businesses, communities and infrastructure to climate change, emphasising the need for urgency on climate action across all sectors of society. The adverse impacts of climate change can often compound wider reaching social, environmental and economic challenges. This can increase vulnerability and sensitivity to a changing climate and climate extremes.

9.5 PREDICTED IMPACTS FROM THE PROPOSED DEVELOPMENT

In Ireland, some sectors have independently begun the process of identifying key vulnerabilities for their activities. Other research work on adaptation in specific sectors has been carried out or commissioned by other Government Departments/bodies. As each sector develops its sectoral adaptation plan (under the Climate Action and Low Carbon Development Act 2015), detailed vulnerability and risk analysis will be required. Some preliminary work has been undertaken on costing the impacts of climate change in Ireland. This is now being supported by more detailed analysis of the current and future costs of flood risk management.

The implementation of adaptation is being supported by the development of a suite of guidelines, tools and approaches. These include the Local Authority Adaptation Strategy

Development Guideline; and the Irish climate information platform "Climate Ireland", which includes data, information, tools and approaches for local level adaptation decision making. Work is ongoing to develop sectoral decision-making tools and supports.

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There are no specific tools developed for assessing climate change for extractive industries. The Climate Change and Major Project guidelines on how to make investments resilient to climate change provides a methodology for undertaking a vulnerability and risk assessment.

Climate change adaptation and mitigation are to be increasingly integrated in the preparation and approval of proposed developments. Adaptation seeks to ensure adequate resilience of a proposed development to the adverse impacts of climate change based on Vulnerability. Mitigation seeks to reduce the emissions of greenhouse gases.

9.5.1 Development Vulnerability Assessment

The aim of the vulnerability assessment is to identify the relevant climate hazards foreseen at the development location. Main steps include identifying and combining the sensitivity and exposure of the project which will describe the vulnerability, while the risk will be determined by likelihood and impact. Adaptation through project options, appraisal, and planning will depend on the assessed project vulnerability and risk.

Timescale for the project vulnerability and risk assessment shall correspond to the lifespan of the project. During the lifespan, there could be significant changes in frequency and intensity of weather events due to climate change, which should be taken into account.

The likelihood analysis of the proposed development to climate hazards is presented in Table 9.1. The proposed development has been assessed to be moderately affected by extreme rainfall, flash (pluvial) flood, storms, and winds. The proposed development would be unlikely affected to cold spells, landslides and snow. The proposed development would not be affected by heat, drought, wildlife fires and freeze – thaw damage.

The closest watercourse to the site is located 1.5km to the south (EPA Ref: KILCHREEST_010). The site is not at risk of flooding. The proposed development will not be affected by rising sea level.

	Extreme rainfall, flash flood	Flood	Heat	Drought	Wildlife Fires	Storms and winds	Landslides	Cold Spells and snow	Freeze – thaw damage	Rising sea levels
Rare		✓	✓	✓	✓				✓	✓
Unlikely							✓	✓		
Moderate	✓					✓				
Likely										
Almost certain										

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Table 9.1 Analysis of Likelihood of Climate Hazards

Table 9.2 shows the climate hazard impact analysis of the proposed development. It was assessed that climate hazards will have major impacts on health and safety, the environment and financial areas, moderate impacts on asset damage and engineering, operational, social and reputation areas.

Risk Area	Insignificant	Minor	Moderate	Major	Catastrophic
Asset damage, engineering, operational			✓		
Safety and Health				✓	
Environment				✓	
Social			✓		
Financial				✓	
Reputation			✓		

Table 9.2 Climate Hazard Impact Analysis

Table 9.3 assesses the sensitivity of the project to climate hazard. It was assessed that site assets, energy inputs, outputs (limestone) and transport links are of high sensitivity to extreme rainfall, flood, flash floods, storms, and winds; water inputs will be highly sensitive to droughts. On-site assets will be medium sensitive to cold spells and snow and freeze – thaw damage. Transport links will be medium sensitive to cold spells and snow.

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	Extreme rainfall, flash flood	Flood	Heat	Drought	Wildlife Fires	Storms and winds	Landslides	Cold Spells and snow	Freeze – thaw damage	Rising sea levels
On-site Assets	High	Low	Low	Low	Low	High	Low	Medium	Medium	Low
Inputs - Water	Low	Low	Low	High	Low	Low	Low	Low	Low	Low
Inputs - Energy	High	Low	Low	Low	Low	High	Low	Low	Low	Low
Outputs (Limestone)	High	High	Low	Low	Low	Medium	Low	Medium	Low	Low
Transport Links	High	Low	Low	Low	Low	High	Low	Medium	Low	Low
Highest Sensitivity Score	High	Low	Low	High	Low	High	Low	Medium	Low	Low

Table 9.3 Sensitivity of Project to Climate Hazards

In Table 9.4, the exposure of the planned development to climate hazards was assessed. In the current climate, the exposure of the development to extreme rainfall, flood, flash flood, storms, and winds has been assessed to be medium. In the future, the development was assessed to have high exposure to rainfall, flash flood, storms, and winds.

	Extreme rainfall, flash flood	Flood	Heat	Drought	Wildlife Fires	Storms and winds	Landslides	Cold Spells and snow	Freeze – thaw damage	Rising sea levels
Current Climate	Medium	Low	Low	Low	Low	Medium	Low	Low	Low	Low
Future Climate	High	High	Low	Low	Low	High	Low	Low	Low	Low
Highest Exposure Score	High	High	Low	Low	Low	High	Low	Low	Low	Low

Table 9.4 Exposure of the Develop ment to Climate Hazards Without Mitigation

Table 9.5 shows the vulnerability analysis of the project to climate hazards; it combines the sensitivity and the exposure analysis. The project was assessed to be most sensitive to extreme rainfall, flash flood, storms, and winds.

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Sensitivity	Exposure (Current & Future Climate)		
	Low	**Medium**	**High**
Low	Rising sea levels, Landslides, Freeze –thaw damage, Drought, Heat, Wildlife Fires	-	-
Medium	-	Cold Spells and Snow	
High	-	-	Extreme Rainfall, Flash Flood, Storms and Winds

Table 9.5 Exposure of the Development to Climate Hazards Without Mitigation

9.5.2 Greenhouse Gas Emissions Assessment

All projects have the potential to emit greenhouse gas (GHG) emissions to the atmosphere during the construction, operational and decommissioning phase of the development. Direct GHG emissions may be caused by operational activities and project commissioning / decommissioning.

Indirect GHG emissions may be due to increased demand for energy and indirect GHG generating activities. Indirect GHG activities linked to the development projects may include transport, space heating of buildings/offices or loss of habitats that provide carbon sequestration, (e.g., through land-use change).

The significance of a project's GHG emissions should be based on its net impact, which may be positive or negative. Where GHG emissions cannot be avoided, the significance of a project's emissions shall be reduced by mitigation or project design. Where GHG emissions remain significant but cannot be reduced further approaches to compensate project emissions should be considered.

Currently in Ireland, there is no set methodology to evaluate significance criteria or a defined threshold for GHG emissions for the mineral extraction industry. Due to the inconsistences between the different methods and their assumptions for assessment, there is no single agreed method by which to assess a project carbon budget. The method of assessment varies according to the type and scale of the development.

Where the GHG emissions cannot be avoided, the mitigation should aim to reduce the development emissions at all stages.

For the purpose of this assessment, GHG emissions have been calculated for the proposed development based on realistic assumed annual energy use at the proposed development in future years.

For the purposes of assessment, it is assumed that the total volume of traffic generated in the future by all extraction activities at the development site will be on average 23 trips each way

per day for max 300 days per year. It has also been assumed that the average distance travelled for each delivery will be 50 km each way.

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It is estimated that c. 80,000 litres of diesel will typically be consumed in a year to power mobile crushing plant and on-site loading plant and equipment. It is also assumed that the weighbridge, wheelwash, pumps and lighting and heating for site offices, welfare facilities and other buildings will collectively consume c.250,000 kWh of electrical power per year.

Total annual GHG emissions associated with the proposed site activities are presented in Table 9.6

Type	Annual value	Distance Travelled	Conversion factor	Calculated	Total annual CO_{2e} kg
Traffic (trips)	~14,000 No.	50km	3.42464[a]	2397.25	
Energy Diesel	80,000 litres		1.034[b]	82,720	
Electrical Power (Offices / weighbridge, etc.)	250,000 kWh		0.2548[c]	63,700	
TOTAL					**148,817.25**

[a] Conversion factor for 2024: HGV Diesel (All HGVs Average Laden Value): UK Government GHG Conversion Factors for Company Reporting

[b] Conversion factor for 2020 Primary Energy Conversion SEAI: diesel.

[c] Conversion factor for Irish power grid 0. 2548 kg CO2 / kWh (Conversion Factors: SEAI Statistics: SEAI, 2023)

Table 9.6 GHG Emissions Calculations

Based on the calculated total of 148,817.25 CO_{2eq} kg and a comparison to Ireland's national total emissions (including LULUCF) of 60.62 Mt CO_{2eq} in 2023, it is assessed that the proposed operations would represent a maximum of 0.000245% of Ireland's annual CO_{2eq} emissions. This represents a **negligible** impact.

The initial phase of the proposed development will be very brief with minimal GHG emission; mostly related to the stripping of overburden and construction of screening berms. All of the necessary plant and infrastructure is in-situ. Based on the scale and extent of proposed activities, GHG emissions generated by the proposed development are assessed as not making a significant contribution to Ireland's annual CO2eq emissions.

9.5.3 Direct Impacts

The proposed development is for a maximum annual extraction rate of up to 120,000 tpa. A quarry of this size would be considered to be a small size scale of operation. GHG emissions associated with the quarry are expected to have an imperceptible negative long-term impact with respect to regional or local climatic conditions.

9.5.4 Indirect Impacts

GHG emissions from plant, machinery and HGVs at the Kilchreest Quarry will represent of the order of 0.000245% of Ireland's national carbon budget, which is a long-term, imperceptible impact in terms of Ireland's contribution to climate change.

9.5.5 Residual Impacts

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It is considered that because of the mitigation measures incorporated into the design that the only residual impact in terms of the local climate may arise from the GHG emissions, albeit likely, direct, long term, imperceptible, negative effects with respect to Ireland's contribution to climate change. It is considered that following completion of the extraction and restoration works there will be an imperceptible positive impact with respect to climate due to restoration of the lands to a natural habitat. The land-use change from a quarry to a natural habitat will result in a net increase in carbon sequestration, and thus a long-term, imperceptible, positive impact in terms of climate change.

9.6 MITIGATION MEASURES

Mitigation is designed to increase the resilience of the development, or wider environmental receptors, to climate change and focuses on increasing capacity to absorb climate related shocks.

As the development is not expected to affect the local climate or microclimate of the area, there is no requirement for mitigation within this development proposal in respect of climatic issues beyond those currently in place. Therefore, there are no mitigations proposed specifically with regard to the local or regional climate. Any impact on the natural environment will be mitigated to the greatest degree practical, thereby minimising any associated impact on the climate.

Climate change mitigation can be integrated into the proposed development, in order to reduce the emissions of GHGs. For example, significant avoidance of GHG emissions can be achieved by the use of power by mains electricity as compared to diesel generators. Where GHG emissions cannot be avoided, the significance of a project's emissions can be reduced by mitigation, such as use of energy efficient plant, appropriately sized plant, and maintaining equipment to optimise process efficiency.

The proposed development will ultimately lead to the restoration of the quarry lands to natural habitat, which will generate no further emissions from fossil fuels or dust, further lessening any impact on the climate.

9.6.1 Project Adaptation Against Expected Climate Change Effects

In the context of climate change, measures to increase the adaptive capacity of the proposed development and disaster risk reduction strategies can be developed with a view to reducing vulnerability and increasing its resilience. Significant incidents related to the climate change that affect operation of the proposed development should be recorded for future analysis.

Based on a development vulnerability assessment (see section 1.5.1) measures to improve the resilience of the project to extreme rainfall, flash flood, storms, and winds are required.

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The resilience of infrastructure to withstand storms, heavy rainfall events and high winds associated with extreme weather events triggered by climate change needs to be integrated into the design of the on-site infrastructure. However, as all the required site infrastructure is already in-situ, there are only limited opportunities to augment climate resilience.

Table 9.7 details mitigation measures for the proposed development relating to climate change adaptation.

Main Concerns Related to:	**Proposed Alternatives or Mitigation Measures**
Extreme Rainfall, Flood, Flash Flood	Consider changes / flexibility in operations that provide for increased run-off across paved areas and possible increases in seasonal groundwater levels.
	Design / provide adequate surface water drainage / discharge to ground.
Storms and Winds	Ensure activities / production can proceed safely during high winds and storms.
	Ensure the choice of equipment deployed on the project is weather efficient.
Risk Reduction Mechanism	Secure insurance for damage of assets / site incidences.

Table 9.7 Mitigation Measures Related to Climate Change Adaptation

9.6.2 Proposed Reduction of GHG Emissions

Table 9.8 details mitigation measures for the application site in respect of reduction of GHG emissions

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Main Concerns Related to:	Proposed Alternatives or Mitigation Measures
Increased demand for energy	Consider using renewable energy sources / suppliers. Use low carbon construction materials where possible.
Direct GHG emissions	Use energy efficient machinery / energy
GHG emissions related to transport	Unnecessary equipment / transport journeys should be avoided by management of transport and travel demands. Equipment should not be left idling. Future fleet electrification may be possible.

Table 9.8 Mitigation Measures Related to Reduction in GHG Emissions.

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CHAPTER 10

NOISE & VIBRATION

10. NOISE AND VIBRATION

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10.1 INTRODUCTION

This noise and vibration impact assessment has been prepared to accompany a planning application, which seeks permission for the continuation and extension of the existing quarry in the townland of Isertkelly North, Kilchreest, Loughrea, Co. Galway.

The lands proposed for the extraction of limestone is accessed via a private road and enters onto a local road which is an authorised access. The planning application boundary is 12.66 hectares with the proposal for extraction of limestone within c 7.5 hectares using conventional drilling and blasting techniques and mineral reduction using mobile crushing and screening. The quarrying excavation operation will progress in a westerly and southerly direction from the existing quarry boundary.

The proposed development will be a continuation of the current quarrying activity. There are no proposed amendments to the inputs, processes or outputs at the existing quarrying activity as part of this application, other than the proposed extension of the activity boundary and extraction areas. An extraction capacity of up to 120,000 tonnes per annum is sought to provide the applicant with the ability to respond to demand for aggregates in the region. . All existing prefabricated building are to be removed and replaced with a permanent office building which will contain offices, toilet, canteen etc. A new plant maintenance shed will also be constructed. Permission is sought for a period of 25 years in order to extract a known resource.

This Noise Impact Assessment report has been prepared by Mervyn Keegan. Mervyn Keegan is a Director of the environmental consultancy, AONA Environmental Consulting Ltd. Mervyn Keegan's areas of professional expertise are in Noise Control & Acoustics and Air Quality & Odour consultancy, including impact assessment and mitigation design. Mervyn Keegan has over 25 years of environmental consultancy experience. Mervyn is a full member of the Institute of Acoustics, the Institute of Environmental Sciences and the Institute of Air Quality Management. Mervyn has a Bachelor of Science Degree (Applied Sciences), a Master of Science Degree (Environmental Science) and a Diploma in Acoustics in Noise Control. AONA Environmental Consulting Ltd. is an independent consultancy specialising in Environmental Impact Assessment and Licensing. Mervyn Keegan has prepared in excess of ten Noise & Vibration and Air Quality & Climate impact assessments per annum for quarry developments in the Republic of Ireland, Northern Ireland and the UK in the last 20 years and is an expert in the awareness and understanding of the relevant legislation and guidance that pertains to best practise in such assessments. Mervyn Keegan has appeared as an Expert Witness at oral hearings, public inquiries and legal hearings. Mervyn Keegan has produced Noise, Air Quality & Odour Impact Assessment reports to assess the impacts of a range of development types including roads, residential developments, industrial developments, quarries and mines and wind energy developments among others.

10.2 METHODOLOGY

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10.2.1 Impact Assessment Methodology

The assessment of the noise and vibration impacts has been undertaken as follows:

- A daytime noise survey in proximity to the nearest noise sensitive locations, to establish the current ambient noise levels in the area.
- AONA Environmental also recorded noise levels in close proximity to existing quarry face extraction activities, mobile crushing and screening and associated haul road activities on the existing active quarry site. Subsequently, an accurate sound power level for these sources has been determined to allow for accurate noise prediction modelling in order to accurately predict future noise levels at the nearest residential properties.
- A prediction of the specific noise levels at the surrounding residential properties from the proposed quarrying, quarry face extraction activities, mobile crushing and screening and associated haul road activities at the quarry site using CadnaA noise prediction software.
- A comparison of the measured existing noise levels and the predicted noise levels at the surrounding residential properties (Noise Sensitive Receptors [NSR's], Ref's: NSR 1 - 8) against relevant guidelines.

10.2.2 Relevant Guidelines and Standards

The noise and vibration impact assessment has been undertaken with regard to the following established standards and guidelines to determine the impact of the proposed Quarry site activities on the surrounding noise environment and assess for the potential for noise disturbance at existing noise sensitive receivers in the locality:

- Quarries and Ancillary Activities, Guidelines for Planning Authorities, April 2004, Department of the Environment, Heritage and Local Government. (DoEHLG Guidance)
- Environmental Management Guidelines Environmental Management in the Extractive Industry (Non-Scheduled Minerals), Environmental Protection Agency (2006)

The Quarries and Ancillary Activities, Guidelines for Planning Authorities states that following with regard to the control of noise and blasting;

'Control of noise: Noise-sensitive uses in the vicinity of a quarry, such as dwellings, schools, hospitals, places of worship or areas of high amenity, require that the amount of noise be minimised. The sensitivity to noise is usually greater at night-time (20.00 to 08.00) than during the day, by about 10 dB(A). Many quarries are situated in areas of low background noise and it is appropriate to consider this when setting noise limits. In general, it can be expected that complaints will result where the noise from quarrying and associated activities are between 5 to 10 dB above the background noise levels. In areas of higher background noise levels, the EPA recommends that ideally, if the total noise level from all sources is taken into account, the noise level at sensitive locations should not exceed a L_{Aeq} (1 hour) of 55 dB(A) by daytime and

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a L_{Aeq} (15 minutes) of 45 dB(A) by night-time. Audible tonal or impulsive components in noise emissions (e.g. the reversing siren on a lorry, required for safety reasons) can be particularly intrusive, and such components should be minimised at any noise-sensitive location.

It may be necessary to raise the noise limits to allow temporary but exceptionally noisy phases in the extraction process, or for short-term construction activity which cannot meet the limits set for routine operations, e.g. the construction of baffle mounds, which bring long-term environmental benefits.

The developer may be required to carry out noise surveys to measure noise levels at the site boundary near sensitive locations, as agreed in advance with the planning authority. Surveys should be carried out in accordance with the EPA's "Environmental Noise Survey – Guidance Document" (2003). Noise monitoring should be carried out on a quarterly basis (or as otherwise agreed), and commenced prior to the commencement of development. The results should be reported to the planning authority within 3 weeks (or as agreed). 95% of all noise measured shall comply with the specified limit values. No individual noise measurement should exceed the limit values by more than 2 dB(A).

Control of blasting: Nearby residents (e.g. within 500 meters) need to be given advance notice when blasting operations are due to take place, which should only be carried out between 09.00 and 18.00 hours, Monday to Friday (except in emergencies or for health and safety reasons beyond the control of the developer). Similarly, such residents should be given the "all clear" signal by means of sirens or other agreed measures when blasting has been completed.

The EPA recommends that to avoid any risk of damage to properties in the vicinity of a quarry, the vibration levels from blasting should not exceed a peak particle velocity of 12 millimeters per second as measured at a receiving location when blasting occurs at a frequency of once per week or less. In the rare event of more frequent blasting, the peak particle velocity should not exceed 8 millimeters per second. The nature of the underlying rock can influence the way blast vibrations are transmitted through the ground to locations outside the site, so it is important that such information (including predicted vibration levels in adjacent noise-sensitive receptors) be submitted with the planning application where relevant.

Blast noise is characterised by containing a large proportion of its energy within a frequency that is below the normal hearing range and is therefore termed "air overpressure." The EPA recommends that blasting should not give rise to air overpressure values at the nearest occupied dwelling in excess of 125 dB(Lin)$_{max.\ peak}$ with a 95% confidence limit.

The developer should carry out blast monitoring (ground borne vibration and air overpressure) for each blast. The monitoring locations should be as agreed within the planning authority and shall be established prior to the commencement of blasting. The results should be reported to the planning authority on a regular agreed basis. Ground borne vibration levels measured at the nearest occupied dwelling should not exceed the specified limit values. 95% of all air

overpressure levels measured at the nearest occupied dwelling shall conform to the specified limit value. No individual air overpressure value should exceed the limit value by more than 5 dB(Lin)'.

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As outlined in the Environmental Management Guidelines Environmental Management in the Extractive Industry (Non-Scheduled Minerals), Environmental Protection Agency (2006), the Environmental Protection Agency (EPA) has produced a Guidance Note for Noise in Relation to Scheduled Activities (EPA, 1996). It deals in general terms with the approach to be taken in the measurement and control of noise, and provides advice in relation to the setting of noise Emission Limit Values (ELV) and compliance monitoring. In relation to quarry developments and ancillary activities, it is recommended that noise from the activities on site shall not exceed the following noise ELVs at the nearest noise-sensitive receptor:

- Daytime: 08:00–20:00 h $L_{Aeq\ (1\ h)}$ = 55 dB(A)
- Night-time: 20:00–08:00 h $L_{Aeq\ (1\ h)}$ = 45 dB(A)

Note:

- 95% of all noise levels shall comply with the specified limit value(s). No noise level shall exceed the limit value by more than 2 dB(A).
- On-site activities should be permitted during night-time hours where they comply with the noise ELVs (e.g. heating up of asphalt plants, loading of materials).
- Where existing background noise levels are very low, lower noise ELVs may be appropriate.
- Audible tones or impulsive noise should be avoided at night.
- It is also appropriate to permit higher noise ELVs for short-term temporary activities such as construction of screening bunds, etc., where these activities will result in a considerable environmental benefit.
- In relation to blasting activities within quarry development, it is recommended that the following vibration and air overpressure ELVs are adopted and applied at the nearest vibration and air overpressure sensitive location (e.g. a residential property):
  Ground-borne vibration: Peak particle velocity = 12 mm/s, measured in any of the three mutually orthogonal directions at the receiving location (for vibration with a frequency of less than 40 Hz)
  Air overpressure: 125 dB (linear maximum peak value), with a 95% confidence limit.
- Normal hours of blasting should be defined (e.g. 09:00–18:00 h Monday to Friday), and provision should be included to permit blasting outside these hours for emergency or safety reasons beyond the control of the quarry operator.
- It is recommended that quarry operators provide advance notification of blasting to nearby residents through use of written notes, signage at site entrance, telephone, or warning sirens (or a combination of these methods).

On the basis of the above, the following noise limits are suggested for the operation of the quarry site including extraction activities using conventional drilling and blasting techniques

and mineral reduction using mobile crushing and screening as well as noise from the value-added manufacturing activities which will use rock from the quarry to manufacture a number of construction products.

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The equivalent sound levels attributable to all on-site operations associated with the development shall not exceed 55 dB(A) L_{eq} over a continuous one hour period between 0700 hours and 1900 hours on Monday to Friday inclusive, and 0700 hours and 1400 hours on Saturday, when measured at any noise sensitive receptor. Sound levels shall not exceed 45 dB(A) at any other time.

Condition 6 of the extant planning permission states the following :

"During the operational phase of development, the noise level at existing sensitive locations shall not exceed a Laeq (1 hour) of 55dB (A) between 0800 and 1800 and an Laeq (15 minutes) of 45 dB (A) between 1800 and 0800. Noise monitoring shall be carried out at the noise monitoring locations N1 to N4 as indicated in the EIS documentation on a quarterly basis in accordance with the EPA "Environmental Noise Survey – Guidance Document", 2003".

10.2.3 Relevant Guidelines and Standards

CadnaA has been developed to allow detailed noise predictions to be undertaken in accordance with:

- ISO 9613-2:2024 Acoustics – Attenuation of sound during propagation outdoors – Part 2: Engineering method for the prediction of sound pressure levels outdoors.
- BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. Noise

The CadnaA noise prediction model allows for noise from all sources entered into the model to be undertaken simultaneously. The noise model can take topographical effects, ground absorption, screening effects, reflections and focusing effects, among others, into consideration. The modelling software calculates noise levels based on the emission parameters and spatial settings that are entered. The model calculates the propagation of the sound from each noise source and produces a noise level contour map and graphics in proximity to a facility with colour coded noise level contours.

Model parameters, sources, and settings have been incorporated into the model as detailed in Table 10.1. The noise model has been produced using accurate and verifiable noise level readings taken in proximity to existing operational quarry site activities and ensures that the noise prediction model provides an accurate verifiable prediction at all noise sensitive receptors in the vicinity of the proposed Quarry site. Thus, the noise prediction model provides an appropriate level of confidence when assessing specific noise impact from the proposed Quarry site.

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AONA Environmental has undertaken a site noise survey with source specific noise level readings taken in close proximity to the main noise sources on existing quarry sites, which will operate during the proposed development. This allowed for the generation of accurate sound power levels for all main noise sources on the site. For the purposes of noise impact assessment, the Sound Power level (L_W) was determined by measuring the Sound Pressure Level (L_P) at a specific distance from the noise source and assuming a Directivity Index (Q) of 2, i.e. hemispherical propagation, using the following equation;

$$L_W = L_p + |10 \cdot \log\left(\frac{Q}{4\pi \cdot r^2}\right)|$$

Parameter	Source	Details
Horizontal distances – Quarry and surrounding area	Collins Boyd	Scaled drawings in AutoCAD format.
Quarry Dimensions	Collins Boyd	Scaled drawings in AutoCAD format.
Receiver Locations	AONA Environmental	In outdoor amenity areas adjacent to nearest residential properties @ 1.5m height.
Plant types, location & Sound Power Level	Collins Boyd / site operator.	Source noise measurements were undertaken in close proximity to plant and equipment on existing quarry site. This allowed for an accurate Sound Power Level L_w to be assigned to active plant.
Ground Absorbtion	AONA Environmental	A Ground Absorbtion Rate – G = 0.5 has been used in the model, which is appropriate for the surrounding land type.

Table 10.1 Modelling Parameters, Source and Assumptions

10.3 ASSESSMENT OF BASELINE NOISE & VIBRATION CONDITIONS

10.3.1 Baseline Noise Survey

A baseline noise survey was completed by AONA Environmental on Friday 22nd November 2024 to establish the current ambient noise levels in the area. There are a number of noise sensitive receptors located in the vicinity of the site access along the local road at Isertkelly North, Kilchreest, Co. Galway. The adjacent Roadstone Quarry has been closed since July 2024, with no known date for re-commencement.

One noise monitoring location (NML 1) was selected in proximity to existing residential properties in the vicinity of the site access along the local road. The noise monitoring location is representative of the existing background noise level at the noise sensitive receptors (NSR's) located in the vicinity of the proposed quarry extension.

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The 'baseline' noise monitoring survey has been conducted in accordance with *ISO 1996, Acoustics – Description, Measurement and Assessment of Environmental Noise* and with reference to the 2016 EPA publication, *"Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4).* Weather conditions on the date of the survey were dry, calm and approximately 7°C.

The noise monitoring was undertaken using a Norsonic Precision Sound Analyser Nor140 (Serial No. 1402988 – Calibration Date – 13/04/2023). The sound level meter was located at a height of ~1.5m off the ground. A wind shield was used on the microphone throughout the survey and the sound level meter was calibrated before, during and after the survey. The Time Weighting used was Fast and the Frequency Weighting was A-weighted. The principal noise measurement parameters recorded during the survey was the equivalent continuous A-Weighted Sound Pressure Level, $L_{Aeq, T}$. and the background noise level $L_{A90, T}$. A statistical analysis of the measurement results was also completed so that the percentile levels, LAN, T, for N = 90% and 10% over specific measurement intervals were also recorded. The percentile levels represent the noise level in dB(A) exceeded for N% of the measurement time. The measurement parameters recorded during the baseline survey are defined as follows:

- L_{Aeq} is the A-weighted equivalent continuous steady sound level during the sample period.
- L_{A10} is the A-weighted sound level that is exceeded for 10% of the sample period and is generally used to quantify traffic noise.
- L_{A90} is the A-weighted sound level that is exceeded for 90% of the sample period and is generally used to quantify background noise.
- A-weighted Decibel (dBA): Decibels measured on a sound level meter incorporating a frequency weighting (A Weighting) which differentiates between sound of different frequency (pitch) in a similar way to the human ear. This takes account of the fact that the human ear has different sensitivities to sound at different frequencies.

The noise monitoring location (NML) and the noise sensitive receptor locations (NSR's) selected for the noise impact assessment are shown in Figure 10.1. Note: NSR 4 and NSR 7 are in the ownership of Kilchreest Quarry.

Figure 10.1 Noise Monitoring Location (NML1) and Noise Sensitive Receiver (NSR) locations in proximity to the nearest residential properties to the Kilchreest Quarry Site

NML 1							
Date	Time	Duration	L_{Aeq} (dB)	L_{AMax} (dB)	L_{AMin} (dB)	L_{A10} (dB)	L_{A90} (dB)
22/11/2024	10:21	00:08:32	54.9	77	26.4	44.6	29
22/11/2024	10:30	00:15:00	56.2	79.7	25.9	42.2	28.2
22/11/2024	10:45	00:15:00	53.6	78.3	26.1	46.5	29.1
22/11/2024	11:00	00:15:00	61.3	83.8	29.8	53.4	32.1
22/11/2024	11:15	00:10:18	60.8	80.3	28.7	50.4	31.3
22/11/2024	12:31	00:13:32	59	82.3	25.4	48.4	27.6
22/11/2024	12:45	00:15:00	58.2	82.7	33.7	46.4	34.6
22/11/2024	13:00	00:15:00	59.7	81.3	33.6	51.7	34.8
22/11/2024	13:15	00:15:00	61.3	85.9	26.4	51.8	29.4
22/11/2024	13:30	00:02:07	61.3	79.3	27.5	56.1	30.8
Average			*59*	*81*	*28*	*49*	*31*

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Table 10.2 Baseline Noise Monitoring Results in Proximity to the Nearest Residential Receivers to the Kilchreest Quarry

At NML 1, in close proximity to the local road, near to the quarry access road and approximately 350m from the centre of the existing quarry extraction area, the measured noise level is in excess of the quarry noise limit of 55 dB L_{Aeq}. However, this primarily due to passing traffic on the local road. The background noise level L_{A90} at the NML is approximately 31 dB(A) with existing operations at the Kilchreest Quarry site. This low background noise level indicates that the existing quarry does not cause a significant noise impact at the noise sensitive receiver locations along the local road. Operations at the Roadstone quarry were also noted to be insignificant at the noise sensitive receiver locations along the local road.

The noise level at NML 1 is representative of the existing noise level at NSR 1 - 8. The following plant and equipment was noted to be in operation in the existing quarry on the date of the survey;

- Komatsu PC 210 excavator [vegetation clearance at edge of extension area]
- Hitachi Zaxis 350 lch excavator [moving rock at top of quarry near the excavator]
- Volvo L150H loader [filling lorries]
- Hitachi ZW330 loader [filling screener]
- Crusher (Metso Lokotrak LT1213)
- Chipping plant - Screener - Kleemann and Powerscreen 1000 max trax rock crusher. [Also, a small mobile screener - Maxtec, not operating]

10.3.2 Compliance Noise Surveys

In accordance with the relevant existing planning conditions, Kilchreest Quarry undertake Quarterly Noise Monitoring Reports at the monitoring locations shown in Figure 10.2.

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Figure 10.2 Noise Monitoring Location (NMLs) as Described in Condition 6 of the Extant Planning Permission

The monitoring locations NSL2 and NSL3 are considered to be "noise sensitive locations" as defined by the EPA while N1 and N4 are defined as “boundary noise locations” where the specified limit values do not apply. It has continually been reported that at monitoring locations NSL2 and NSL3, during both daytime and night-time monitoring periods, noise emission values at both NSL2 and NSL3 were within the prescribed limits as stated in the planning conditions.

10.3.3 Baseline Vibration Survey

No vibration monitoring data is available for the area in proximity to the Quarry site. Baseline vibration monitoring with the use of a vibrograph has not been undertaken at the nearest residential properties to the Quarry site. The DoEHLG Guidance provides a limit for ground-borne vibration: Peak particle velocity = 12 mm/s, measured in any of the three mutually orthogonal directions at the receiving location (for vibration with a frequency of less than 40

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Hz). The DoEHLG Guidance provides a limit for Air overpressure: 125 dB (linear maximum peak value), with a 95% confidence limit. These limits cannot be exceeded by existing and/or future proposed blast practices.

10.4 PREDICTED NOISE & VIBRATION IMPACTS

10.4.1 Noise Impact Assessment

It is proposed that the mineral will be extracted in a phased manner. The development will be undertaken in five phases, as described in the Project Description.

The hours of operation associated with the proposed mineral extraction at the Quarry site will be during daytime hours, between 0800 – 1700 Monday to Friday and 0800 - 1300 on Saturdays.

It is anticipated that the site will be worked at a rate of approximately 120,000 tonnes per annum. The aggregate products will be stockpiled on the quarry floor, prior to being transported off-site via HGV. This will result in an average of c. 25-30 lorries to and from the site daily.

For the purposes of the noise prediction model and to facilitate an assessment of the worst case scenario the methods of extraction will include excavation at source, mobile crushing and screening, loading for transport off site. Drill rig operation and blasting occurs every two months.

AONA Environmental has undertaken noise level readings in close proximity to the noise sources on site, i.e. excavation at source, mobile crushing and screening and HGV vehicle movements. The equivalent continuous sound pressure levels (L_p) were measured at a reference distance from the individual items of plant and machinery and a corresponding sound power level (L_w) determined. The Overburden Removal works will involve the use of an excavator, haul truck and possibly a dozer for bund construction. This allowed for an accurate noise model of the future proposed noise sources on site to be prepared. The sound power levels used in the noise models are presented in Table 10.3.

For the purposes of noise impact assessment, the Sound Power level (L_w) was determined by measuring the Sound Pressure Level (SPL) at a specific distance of 10m from the noise source and assuming a Directivity Index (Q) of 2, i.e. hemispherical propagation, using the following equation;

$$L_W = L_p + \left|10 \cdot \log\left(\frac{Q}{4\pi \cdot r^2}\right)\right|$$

Therefore, the main noise sources and their relevant sound power levels used in the prediction model are as follows;

Source	ID	L_W used in Noise Model (dB)
Face Excavator & Loader	Hitachi Zaxis 350 lch excavator / Komatsu PC210-10 excavator	115 dB L_W (Point Source – combined activity)
Crushing & Screening Plant	Crusher (Metso Lokotrak LT1213) & Chipping plant - Screener - Kleemann and Powerscreen 1000 max trax rock crusher.	120 dB L_W (Point Source)
Unloading / Stockpiling Area	Volvo L150H loader [filling lorries] Hitachi ZW330 loader [filling screener]	104 dB L_W (Point Source)
Bund construction	Komatsu PC 210 excavator	104 dB LW (Point Source)
Haul Road truck movements		105 dB LW (Line Source) – 2 two-way trips per hour at 10 mph

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Table 10.3 Noise Levels Associated With Daily Operations

In terms of periods of air drilling prior to blasting, this is a relatively infrequent activity in a quarry which takes place periodically over approximately 2 days every two months on average in advance of blasting requirements. The air drilling associated with blasting is not a daily operation. However, pursuant to the EIA regulations, an Applicant is required to assess the worst-case scenario. Therefore, the assessment includes the air drilling at locations most proximate to the nearest receivers to present a worst-case simulation. As with all hard rock quarries, where blasting is the normal method of extraction, drilling of holes in preparation for blasting involves the use of a mobile rig to drill holes through the upper rock surface parallel to the active face. The duration of drilling prior to each blast will vary with the number and depth of charge holes required. Drilling of holes will continue to be carried out during permitted operational hours. BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise, outlines the following sound pressure level data measured at 10m from a drill rig noise source. This data has been used to determine a representative average noise level from the use of the drill rig during intermittent use in each phase of future proposed operation. Based on the use of 16T drill rig, noise levels are predicted from periodic drilling on site. Also, with the deepening of the quarry, the benches / quarry walls will attenuate noise breakout from the drill rig operations.

Table C.9 **Sound level data on hard rock quarries**

Ref no.	Equipment	Power rating, kW	Equipment size, weight (mass), capacity	Octave band sound pressure levels at 10 m, Hz								A-weighted sound pressure level, $L_{Aeq,T}$ dB at 10 m
				63	125	250	500	1k	2k	4k	8k	
	Drilling blast holes											
1	Tracked mobile drilling rig	317	20 t / 125 mm dia.	86	92	85	88	84	83	78	77	90
2	Tracked mobile drilling rig	270	23 t / 110 mm dia.	94	95	90	91	87	85	80	73	92
3	Tracked mobile drilling rig	186	16 t	77	83	82	84	85	85	84	79	91
4	Tracked mobile drilling rig	321	—	83	84	79	85	82	79	75	71	87

Outlined in Table 10.4 below are the predicted worst-case noise levels that will occur at noise sensitive receptors (NSR 1 - 8) from the quarry face excavation at source, mobile crushing and screening, loading for transport off site and HGV movements.

NSR Ref.	Existing dB(A)	Phase 1 dB(A)	Phase 2 dB(A)	Phase 3 dB(A)	Phase 4 dB(A)	Phase 5 dB(A)	Drilling dB(A)
NSR 1	43.7	43.7	46.7	44.4	48.6	44.6	48.7
NSR 2	40.1	41.3	43.9	42.2	46.8	42.2	46.5
NSR 3	38.7	40.8	43.4	41.8	46.4	41.5	46.1
NSR 4 (F.I.)	*49.5*	*49.5*	*50.5*	*48.9*	*49.8*	*49.5*	*53.3*
NSR 5	42.9	43.2	45.4	46.5	43.3	43.4	54.2
NSR 6	37.7	33.9	43	47.4	41.2	40.1	54.3
NSR 7 (F.I.)	*38.8*	*35.8*	*44.7*	*49.6*	*43.7*	*42.8*	*55.8*
NSR 8	34.1	38	44	48.3	43.7	39.3	52.8
Max.	43.7	43.7	46.7	48.3	48.6	44.6	54.3
Limit	55						

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Table 10.4 Worst-case predicted noise level (dB $L_{Aeq, 1Hr}$) at Noise Sensitive Receptors (NSR 1 - 8) during the proposed quarry extension activities versus Noise Limit. [See CadnaA noise model outputs shown in Noise Prediction Model Figures 1 – 6]

Note: (F.I.) => in the ownership of Kilchreest Quarry.

Air drilling prior to blasting, takes place periodically over approximately 2 days every two months

Table 10.4 outlines the predicted noise levels at sensitive receptor locations due to the noise sources within the proposed quarry application boundary and worst-case noise levels due to all noise sources within the site during the quarry face removal, associated crushing and screening of the mineral and transport off site.

There is no predicted exceedance of the noise limit of 55 dB $L_{Aeq, 1 Hour}$ during the quarry face removal, associated crushing and screening of the mineral and transport off site. A highest predicted noise level of <50 dB $L_{Aeq, 1 Hour}$, occurs during all of the future proposed extraction Phases at a noise sensitive receivers when extraction in the proposed extraction area progresses from Phase 1 - 5. A slight exceedance of the 55 dB(A) limit may occur at NSR 7 during short-term drilling activities prior to blasting but this property is owned by the applicant.

These noise level predictions are based on a worst-case extraction rate. The predicted noise levels indicate the future noise levels due to the removal and transport of the mineral will be in compliance with the noise limit due to HGV movements and continuous activity at the working face area including excavation and associated crushing and screening of the mineral and transport off site. The proposed future quarry face design will act as a noise barrier between the working face area and the nearest residential properties as the quarry descends to lower levels. Therefore, the quarry face will act as an effective noise barrier in relation to the noise sensitive receiver locations.

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At all noise sensitive receiver locations, the proposed mineral extraction development, can be undertaken so as not to result in an exceedance of the 55 dB $L_{Aeq,\ 1\ Hour}$ limit.

The removal of overburden, earth bund / noise barrier construction and the restoration of the quarry void will be undertaken during an short time period per annum and there will be no exceedance of the noise limit of 55 dB $L_{Aeq,\ 1\ Hour}$ during such periods. The CadnaA noise model outputs are shown in Noise Prediction Model Figures 1 – 6. The CadnaA noise models are available to the relevant authorities upon request.

Blasting:

Blasting will take place throughout each phase of the proposed quarry development. Blasting of the rock is likely to result in an instantaneous significant noise impact. However, this is a short–term noise impact and results in an instantaneous increase in noise levels during daytime hours with immediate reversion back to preceding noise levels. A typical sound level from blasting, measured at 15 m from the source is 94 dB(A) (Hoover 1996). Table 10.5 shows the estimated noise levels in the vicinity of an active blasting site. The accepted reduction in noise levels with distance from a blast is based on the assumption that the sound level drop off rate equates to 6 dB per doubling of distance. Blasting parameters including PPV and Air Overpressure have been set at 12mm/sec and *125 dB (Lin)*$_{max.\ peak}$ for all proposed operations in the Republic of Ireland.

Distance to receiver (m)	Sound Level At Receiver Location dB(A)
15	~ 94
30	~ 88
60	~ 82
120	~ 76
240	~ 70
480	~ 64
960	~ 58

Table 10.5 Estimated Blast Noise in the Vicinity of the Proposed Quarry Area

As indicated in Table 10.5, sensitive receivers within approximately 500m of the blasting site could be exposed to instantaneous noise levels of approximately 65 - 70 dB(A). However,

these blasts will result in short–term and instantaneous noise impacts at all residential receivers in the vicinity of the quarry and do not constitute a significant noise impact.

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Restoration Works:

The noise levels due to any dozer and haul truck activities during restoration works are unlikely to, but may periodically, result in a noise level that exceeds the noise limit of 55 dB $L_{Aeq,\ 1\ hour}$. It is accepted that all operators will have some noisier short-term activities that cannot meet the limits set for normal operations such as overburden removal, bund construction, restoration works, etc. Overburden removal, bund construction, restoration works, etc will be carried out during a short working period window per annum. The restoration activities at the end of the quarry life-span will bring a longer term environmental benefit and the daytime limit of 55 dB $L_{Aeq,\ 1\ Hour}$ is unlikely to be exceeded for such works.

10.4.2 Vibration Impact Assessment

The drill rig operations and blasting for the quarrying process will take place every two months. The drilling using an air drill and compressor will operate for a maximum of approximately two days every two months.

All neighbours will be notified in advance of upcoming blast dates and times. Blast monitoring results will be maintained by the applicant/operator to indicate that vibration levels fall below the limits prescribed by the DoEHLG in their relevant guidance. Therefore, it is considered that any potential vibration impact in relation to the occasional blasting will be negligible. The following general blast design control measures will ensure compliance with recommended guidance levels;

- The optimum blast ratio is maintained and the maximum instantaneous charge is optimised.
- Explosive charges are properly and adequately confined by a sufficient amount and quality, of stemming.
- Accurate face surveys (profiling) are undertaken to assist with blast design and specification.
- No blasting is carried out outside 10:00 – 18.00 hours on working days (Monday to Friday). There is no blasting carried out on Saturdays, Sundays or public holidays.
- All nearby dwellings are given advance notice of blasting.

10.4.3 Assessment of Impacts Against Likely Evolution of Baseline Scenario

The evolution of the baseline is not considered to significantly alter from the current baseline at the quarry site. In terms of the part of the site comprising of an existing quarry, the mineral won and worked at the site has been, and continues to be, applicable to a wide variety of construction uses. The quarry has been operated at the site for over 15 years. Given the nature and properties of the mineral at the quarry site, it is unlikely that the approved method

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of extraction (drill and blasting) will alter. Similarly, it is also considered unlikely that the operations will evolve from that currently experienced at the site, with crushing and screening plant and equipment continuing to be utilised to produce single sized aggregates. Whilst plant, machinery and vehicles used in connection with quarrying processes may become more efficient in the future, it is impossible to predict the extent to which this would affect noise emissions at the quarry. It is however reasonable to conclude that with the continued improvement in quarry machinery, that impacts associated with the same are considered likely to reduce in the future. Given the same, it is considered unlikely that the baseline scenario will evolve to a position whereby mineral extraction ceases at the site or where operations differ significantly to those currently undertaken. Assessment of the proposed development project against any evolution of the current baseline scenario would therefore extend beyond the reasonable effort required, as stated in the EIA Regulations. As such, the current baseline scenario is the appropriate baseline for the purposes of assessing impacts within this report.

The quarry has been in operation and formed part of the environment for in excess of 15 years with appropriate planning permission for mineral extraction and transport granted. For the reasons outlined above it is considered that the baseline scenario, as measured, for the purposes of assessing impacts is the appropriate baseline as provided for by the Environmental Regulations.

The measured existing background noise levels (LA90 values) recorded in the vicinity of the closest receivers to the site can be summarised as follows;

- Existing noise level at NML between the hours of 0800 – 1700 Monday to Friday and 0800 - 1300 on Saturdays is ~59 dB L_{Aeq} / 31 dB L_{A90}. The noise monitoring data and subjective notes indicate that during daytime the existing noise levels at NML 1 are primarily influenced by cars passing on the local road, with quarrying activity faintly audible.

In summary, the quarry is operational for in excess of 10 years and is an established part of the background noise level in the area.

10.4.4 Decommissioning Impacts

When the proposed quarrying and associated manufacturing operations on the site cease in the future, noise levels from de-commissioning of the industrial structures in the Quarry site and / or the regrading of the benches in the existing extraction area and subsequent infill with groundwater will be short-term noise impacts. Such activities may include overburden removal, bund de-construction, restoration works, de-commissioning of plant and equipment, etc. Typically, such works will be carried out during an 8 week window per annum. Such activities will be subject to a higher noise limit of 70 dB(A) as distinct from normal site operations

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10.5 MONITORING

Subject to planning conditions, annual, bi-annual or quarterly noise monitoring surveys will be undertaken at the Quarry site. The noise monitoring surveys will be carried out to evaluate and assess the noise impacts that the quarry site activities have on the local receiving noise environment and to assess compliance with standards contained within the Planning Conditions. The noise monitoring survey will be conducted according to *ISO 1996, Acoustics – Description, Measurement and Assessment of Environmental Noise* and with reference to the 2016 EPA publication, *"Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4).*

10.6 MITIGATION MEASURES

The following mitigation measures will continue to be employed to minimise operational noise impacts;

- Working hours during site operations will be restricted to daytime hours as outlined;
  - 0800 – 1700 Monday to Friday and
  - 0800 - 1300 on Saturdays.
- An on-site speed limit will be enforced for all traffic. Drivers of vehicles will be advised of the speed limits through the erection of signs i.e. a typically recommended on site speed limit of 10 mph.
- Where practicable, the use of quiet working methods will be selected and the most suitable plant will be selected for each activity, having due regard to the need for noise control.
- The operator will employ the best practicable means to minimise noise emissions and will comply with the general recommendations of BS 5228. To this end, the operators will use "*noise reduced"* plant and/or will modify their construction methods so that noisy plant is unnecessary.
- By positioning potentially noisy plant or operations as far as possible from noise sensitive receivers the transmission of sound can be minimised. For example, earth mounds and/or stacks of material on site can be used in such a way that they act as a physical barrier between the source and the receiver. Proposed perimeter bunding will minimise noise breakout from the site and the quarrying noise in the quarry space will be attenuated by the working face of the quarry.
- Mechanical plant used on site will be fitted with effective exhaust silencers. Vehicle reverse alarms will be silenced appropriately in order to minimise noise breakout from the site while still maintaining their effectiveness. All plant will be maintained in good working order. Where practicable, machines will be operated at low speeds and will be shut down when not in use.

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- Employees working on the site will be informed about the requirement to minimise noise and will undergo training on the following aspects:
  - The proper use and maintenance of tools and equipment
  - The positioning of machinery on-site to reduce the emission of noise to the noise sensitive receivers
  - Avoidance of unnecessary noise when operating plant and equipment
- It is recommended that should complaints be received from nearby residential properties periodic noise monitoring will be undertaken during operational works to determine noise levels at noise sensitive receivers. On the basis of the findings of such noise monitoring, appropriate noise mitigation measures should be implemented to reduce noise impacts. Where excessive noise exposure levels are recorded, further mitigation measures should be employed which may include temporary screening of the nearest receiver to on-site activities.
- The establishment stage of the development will include the removal of overburden and the erection of perimeter screening bunds. Advanced earthen screening bunds along the southern, eastern and northern boundaries will be constructed using overburden material stripped from the proposed extraction area. The bunds will be finished with topsoil and seeded/planted with specified species.

10.7 CONCLUSIONS

A detailed noise impact assessment has been undertaken. Representative existing background noise levels have been measured in proximity to the nearest residential properties to the quarry site.

The predicted noise levels have been established based on actual measured noise levels in proximity to actual plant and machinery that is used in the quarry site. Therefore, accurate worst-case predictions of future noise levels relative to each phase of development has been provided.

The predicted noise levels at the noise sensitive receivers due to the proposed mineral extraction and transport will meet the DoEHLG Guidance noise limit of 55 dB $L_{Aeq,\ 1\ Hour}$.

The significance of the noise impact of the proposed mineral extraction related activities depends on the duration of each activity, the particular items of plant used and the time at which the activity occurs. All practical measures will be taken to ensure that the noise emissions associated with the proposed quarry extension and associated operations do not cause excessive noise impact upon the local residents.

In summary, when the measured baseline noise levels and the predicted noise levels from the proposed mineral extraction are compared, there will be no exceedance of the relevant noise limits outlined in The Quarries and Ancillary Activities, Guidelines for Planning Authorities.

The proposed development is therefore not considered to result in a significant effect upon the environment in terms of noise.

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CHAPTER 11

MATERIAL ASSETS

11. MATERIAL ASSETS

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11.1 Introduction

This chapter examines the effects of the proposed development on material assets. The proposed development is described in Chapter 2 and should be read in conjunction with this chapter. The proposed development includes the excavation, processing and transport of rock and other natural materials within the site and externally. The excavation level will not extend beyond 40m. A settlement lagoon and a Wastewater Treatment Plan are the primary designed treatment systems on site.

11.2 Scope of Examination

The EPA Guidelines on the Information to be contained in an EIAR (2022) describe material Assets as built services and infrastructure. Traffic is included because in effect traffic consumes transport infrastructure. Sealing of agricultural land and effects on quarrying potential come under factors of land and soils. This chapter will assess the impacts on the following infrastructure – electricity, telecommunications, gas, water, sewerage and waste management. The author of this chapter is Mr. Stephen Boyd, Chartered Engineer who has over 25 years' experience in designing, delivering and monitoring infrastructure projects. There were no difficulties encountered in completing this chapter.

11.3 Regulatory Background

This chapter had regard to the Guidelines on Information to be contained in EIAR (EPA 2022). The study area is the quarry and its vicinity. The desk top study used published information, knowledge of the applicant, other sections of this EIAR and publically available mapping. The sources of information include –

- Galway County Development Plan 20-30
- My Plan 1
- OSI Maps
- Planning Register Galway County Council

11.4 Built Services

The built services in relation to this application are for the most part already in place. The scale and scope of the proposed development is similar to existing development in terms of consumption of material assets

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(a) Water Supply – the onsite well services the existing washrooms and sanitary facilities. It also supplies the existing tank/reservoir on site which is used for dust suppression as required.
(b) The existing site office is already connected to telecommunications networks. These will not need to be upgraded to service the proposed development.
(c) There is an on-site sewage treatment system which has the capacity to serve the proposed development. There will not be any significant loading increase on the existing system.
(d) The site already has an electricity supply and no upgrade or additional capacity is needed.
(e) Waste Disposal – the existing quarry does not generate any waste outside of domestic type waste arising from the office, wash facilities and canteen. These are collected by a licenced waste contractor and will continue for the duration of quarrying. Any waste generated from plant maintenance also use licenced operators.
(f) Transport – the road network in the vicinity has been the subject of detailed analysis in Chapter 14 and evidence of adequate capacities have been demonstrated.

11.5 Cumulative Impacts

An examination of the planning register since 2016 indicates that there are no proposed developments which will have significant impacts on the capacity of material assets in the region. It is unlikely that new development most of which are small in scale and emote from the immediate vicinity of the quarry will be affected by the quarry. The converse is also the case.

11.6 Mitigation Measures

There are no new significant impacts on built assets arising from the proposed development. There are no mitigation measures proposed.

11. 7 Residual Impact Assessment

There are no residual impacts anticipated on the material assets.

11.8 Planning Policy Framework

The subject site is within the administrative area of Galway County Council and the current County Development Plan 22-28 provides a planning and development justification for the proposed development. The EIAR demonstrates that the proposed quarry accords with the vision of the Council with respect to the sustainable development of quarries. By their nature, stone aggregates can only be harvested where they occur. The cost of haulage is a major component and determines the economic competitiveness and efficiency of quarries. Proximity to developing settlements, existing and proposed infrastructure is what makes

quarries sustainable development. Extractive industry of the type existing and proposed in this application gives rise to detrimental environmental and residential amenity effects.

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In the CDP quarries were examined in Chapter 4 Rural Living and Development as they are invariably located there. They are seen as important components of the rural economy in the county. The preference for the Council is to promote the continued sustainable extraction of existing quarries over the development of new quarries on Greenfield sites. The policy objectives in the CDP include having adequate supply of aggregates to facilitate planned development. In terms of environment protection having regard to the habitats directive, statutory guidelines for quarries and the relevant DM Standard 18. The potential for worked out quarries to become facilities for C&D waste and proper regard for landscaping quarries themselves and the landscape character of areas are relevant considerations.

The proposed development, with the mitigations included in the EIAR, meet all the relevant policy requirements in the CDP with regard to environmental impacts. In addition to the current and past environment management practices demonstrated, the existing quarry has operated at acceptable levels over long periods and the proposal to continue quarrying on these lands will accord with proper planning.

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CHAPTER 12

CULTURAL HERITAGE

12. ARCHAEOLOGICAL, ARCHITECTURAL AND CULTURAL HERITAGE

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12.1 INTRODUCTION

Cultural Heritage is defined by UNESCO as "the legacy of physical artefacts and intangible attributes of a group or society that are inherited from past generations, maintained in the present and bestowed for the benefit of future generations" (www.unesco.org/new/en/cairo/culture/tangible-cultural-heritage). In terms of the present project, Cultural Heritage is assumed to include all humanly created features on the landscape, including portable artefacts, which might reflect the prehistoric, historic, architectural, engineering and/or social history of the area.

The Heritage Act (1995) contains a list of various aspects of heritage, including archaeological monuments and objects, architectural heritage, fauna, flora, geology, heritage gardens and parks, heritage objects, inland waterways, landscapes, monuments, seascapes, wildlife habitats and wrecks.

The Cultural Heritage of the area of the proposed project was examined through an Archaeological, Architectural, and Historical study. The Archaeological and Architectural studies involved a documentary/ cartographic search and focussed field inspection of the area, while the Historical study involved a documentary search.

This chapter discusses the receiving environment from a Cultural Heritage perspective. It provides information with respect to previously identified baseline data and assesses the impact of the proposals on identified sites and areas of Cultural Heritage interest and/or potential.

12.2 METHODOLOGY

12.2.1 Definition of Study Area

The subject development lands (application red-line boundary) and an area of *c.* 1000m surrounding such lands were determined to be the Study Area for Cultural Heritage. The extent of the Cultural Heritage Study Area was chosen on the basis of the topography of the subject site and environs and to reflect an appropriate context for the development, beyond which it was considered that a development of this nature would have no direct/indirect impacts.

12.2.2 Paper Survey

As part of a documentary/cartographic search, the following principal sources were examined from which a list of sites and areas of Cultural Heritage interest/potential was compiled:

- Record of Monuments and Places (RMP) – Co. Galway

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- Sites and Monuments Record (SMR); National Monuments Register, Register of Historic Monuments (RHM), National Monuments Service Wreck Viewer & Lists of Monuments subject to Preservation Orders (PO) – www.archaeology.ie
- Topographical File Records of the National Museum of Ireland
- Annual Archaeological Excavation Bulletin – www.excavations.ie
- Historic cartographic and aerial photographic records of Ordnance Survey Ireland/Fáilte Éireann – www.osi.ie
- National Inventory of Architectural Heritage (NIAH) – Galway County Council – www.buildingsofireland.ie
- Heritage Council Data – www.heritagemaps.ie
- Documentary and cartographic sources (See Appendix 12.1)
- Galway County Development Plan 2022-2028 (GCDP)
- Placenames Database of Ireland – www.logainm.ie
- National Folklore Collection (The School's Collection) – www.duchas.ie

12.2.2 Field Inspection

From the preceding paper survey, a list of cultural heritage sites/sites of cultural heritage potential was compiled for inspection. The Proposed Development Area (PDA) and a *c.* 1000m area surrounding the boundaries of such lands were assessed for the presence of archaeological monuments by reference to map and aerial photographic sources. Intensive field surveys of the subject lands were undertaken in late October 2024 and early January 2025.

An attempt was also made to identify previously unrecorded sites of cultural heritage potential within, and in the immediate environs of, the proposed development area.

Sites of cultural heritage potential identified on the basis of the paper survey were inspected in an attempt to confirm their locations on the ground and to determine, if possible, their likely extent.

12.2.3 Consultation

Consultation with the National Monuments Service (NMS), Department of Housing, Local Government and Heritage was undertaken with respect to Archaeological Heritage in July 2024 and it was recommended that the development be subject to an Archaeological Impact Assessment, as follows:

- Archaeological Geophysical Survey of the proposed development area (licensed as required under the National Monuments Act).

- Based on the results of the above survey and follow-up consultation with NMS, a comprehensive programme of archaeological test excavation (licensed as required under the National Monuments Act) is required.
- A report detailing the results of these archaeological works; the report must contain a comprehensive archaeological impact statement and set out appropriate measures to mitigate the impacts of the proposed development on the archaeological resource.

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The results of the required Geophysical Survey and follow-up programme of Archaeological Testing are discussed below in Section 12.3.2.6.

12.3 RECEIVING ENVIRONMENT

12.3.1 Local History

The subject PDA lands form part of the townland of Isertkelly North, the civil parish of Isertkelly and barony of Loughrea (O.S. 6" Map: Galway Sheets 104 & 114). The name Isertkelly derives from the Irish *Díseart Ceallaigh* – the 'hermitage of the Kellys' – and is first recorded in about 1200 (Placenames Database – www.logainm.ie); the 'hermitage' is likely associated with a Church and Graveyard to the west-southwest of the subject PDA (See SITE CH-12; Section 12.32.3. below).

In the early historic/medieval period, the general area of the present South Galway, largely coextensive with the present diocese of Kilmacduagh, was known as *Aidhne*. It was bounded on the west by *Loch Lurgain* (Galway Bay) and the district of Burren in County Clare; County Clare also bounded *Aidhne* on its south and south-east sides, with the eastern extent formed by the low mountains of Slieve Aughty; the plains of *Uí Mhaine* formed the boundary to the northeast, the area around Athenry (*Maigh Mucruimhe*) formed the northern boundary and to the northeast it was bounded by the parish of Maree which was in the territory of *Uí Bhriúin Seola* (MacNiochoill (1972, 37). At this time, the *Aidhne* branch of the *Ui Fiachrach* dynasty emerged as the ruling *tuath* in this part of Connacht, and the area became known as *Uí Fiachrach Aidhne*; its most important septs/families included *Ó hEidhin, Ó Seachnasaigh, Ó Cléirigh* and *Mac Giolla Cheallaigh*. By the 8th century the power of its kings were greatly curtailed and became minor vassals of the Kings of Connacht.

When Connacht was subinfeudated by the Anglo-Normans in 1235, Maurice Fitzgerald of Offaly acquired extensive territories under the de Burgh overlord of Connacht, including what became known as the 'cantred of Aidhne' (Knox, 1901, 366); however, in around 1300, all of the Fitzgerald lands in Connacht were transferred to, or acquired by, the de Burgh earl of Ulster and lord of Connacht. At this time Ardrahan served as an important settlement centre of the Anglo-Norman cantred of *Ui Fiachrach Aidhne* and in a 1321 Extent or valuation of the Manor of Ardrahan, taken as part of an *Inquisition Post Mortem* following the death of

Thomas de Clare, one William fitz Hubert de Burgh was given as a freeholder of the manor, which included lands at Isertkelly (Knox, 1903, 183).

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Following a decline in the Anglo-Norman power in Connacht during the early fourteenth century, the Burkes, and their various associated family groups became the dominant family in County Galway. The Burkes descended from *Richard Mór de Burgh*, 1st Lord of Connacht (died 1243), son of William de Burgh; they held the title Clanricarde (Irish: 'Richard's Family') which was subsequently used in the title of the earldom created by Henry VIII in 1543.

As the population of the various branches of the Burkes expanded, they consolidated their positions for the most part within the confines of the lands with which their particular family group had become associated. The territory of the MacHubert Burkes was known in the late medieval and early modern period as 'Pubbell MacHubert' or 'the people of MacHubert,' centred about Isertkelly in what was the old parish of that name and about the parish of Killinan. As such their lands lay deep within the wider territory of Clanricarde in the half barony of Loughrea, not distant from the centre of power of the MacWilliam Burke chieftains. Like many partly-Gaelicised septs of Anglo-Norman origin, by the late fourteenth and early fifteenth centuries the head of the sept was known by a Gaelic title or patronymic, derived from a common ancestor of the branch. In the case of the de Burghs or Burkes based about Isertkelly, the name MacHubert was said to derive from their reputed ancestor Sir Hoibeard or Hubert, that younger son of Walter earl of Ulster. It was this family who were responsible for the construction of Isert Kelly Castle (Site CH-12 below).

Figure 12.1 Extract from 1670 Map – Isertkelly is marked 'Isrekelly'

When the Roman Catholic King James II was deposed and the crown offered to his Dutch son-in-law, the Protestant Prince William of Orange and his wife Mary, the Irish Catholics rose up in support of King James, and an army was sent by the French King to reinforce James' Irish supporters, the Jacobites. In March 1689 James landed in Ireland to head his army here, hoping to regain his throne through Ireland. At the outbreak of war in Ireland between the Jacobites and the Williamite supporters of William and Mary, many of the most prominent Roman Catholic landholders of county Galway had taken up commissions as officers in the newly formed Irish Jacobite regiments. Four regiments raised from county Galway saw active service throughout the war and among those from about the east Galway area who served as

officers in those regiments was Captain Garrett Burke, a descendant of the MacHubert Burkes. The war concluded with the defeat of the Jacobite army and the signing in October 1691 of the Treaty of Limerick. Much of Garrett Burke's estate in east Galway was forfeited and was transferred, with other lands in the region to Trustees of the Crown; in 1703 the Trustees sold a large estate of land in east Galway, including the lands at Isertkelly, to Sir William Scawen, a wealthy English banker.

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At the same time, Dudley Persse, an Anglican priest and former Dean of Kilmacduagh, purchased 371 Irish acres of forfeited land in the parish of Killinan; subsequent to this, in the early decades of the eighteenth century the Persses acquired extensive estates about the parishes of Isertkelly and Killinan, the former lands of the MacHubert Burkes. They constructed a new mansion known as Roxborough on what was the former Burke lands at Cregrosty and which was thereafter was the seat of the Persse family for 245 years until destroyed by fire in 1922 during the Irish Civil War; in the mid eighteenth century the family purchased the lands about Moyode and Castleboy from a London merchant who had acquired part of the property of Sir William Scawen in County Galway (Fahey, 1893, 321), and which were subsequently known as Castleboy Demesne. Persse founded a dynasty that was to dominate society in Galway and Connacht into the early 20th century. The family was prolific, members including: William Persse, Irish volunteer (c. 1728 – 1802), Henry Stratford Persse, writer (died 1833), Sarah Persse, suffragist, fl. 1899, Augusta, Lady Gregory, Irish nationalist, landlord, author and dramatist (1852–1932) and Hugh Lane, Irish art dealer, collector and gallery director (1875–1915).

The Roxborough Estate is indicated by Taylor and Skinner in 1777 (Figure 12.2), with a more detailed depiction illustrated by William Larkin in 1819 (Figure 12.3).

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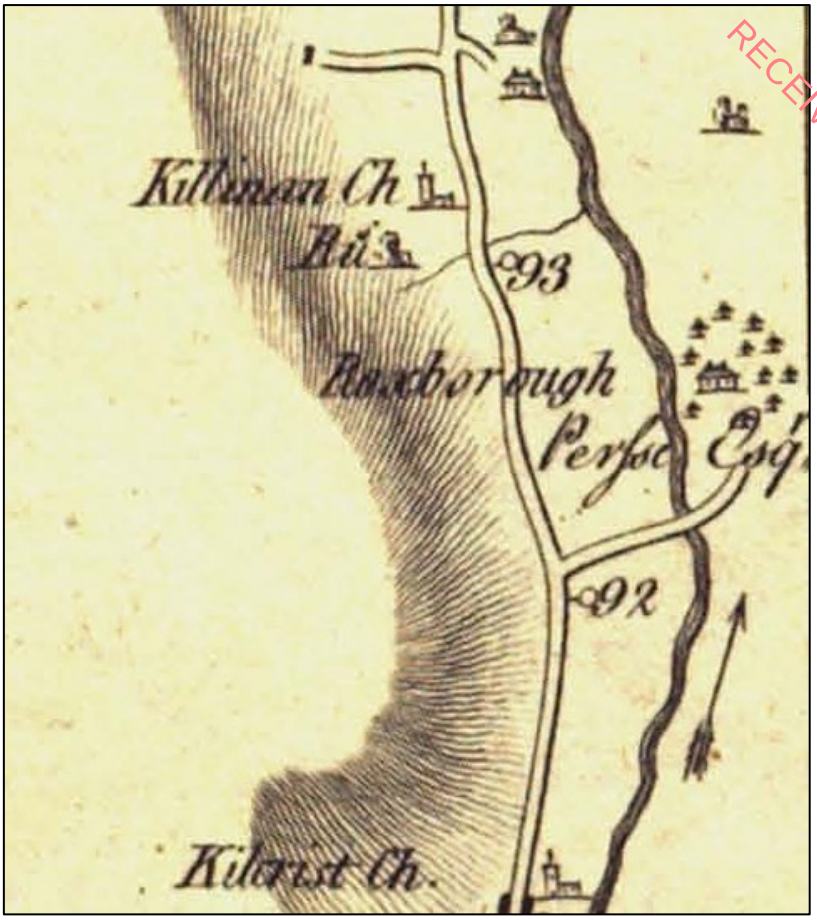

Figure 12.2 Extract from Taylor & Skinner – 1777 (Sheet 92)

Figure 12.3 Extract from William Larkin's Grand Jury Map of 1819 (Sheet 11)

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Lewis (1837, Vol. 2, 26) described the parish of Isertkelly as containing 282 inhabitants and notes that Castleboy Demesne, the "seat of R. Persse, Esq", contained the ruins of an ancient castle in 'good preservation'. He further noted that the parish was a vicarage, in the diocese of Kilmacduagh, forming part of the union of Killinane; the rectory was appropriate to the see; the tithes amounted to £34, of which £6 was payable to the Ecclesiastical Commissioners, and the remainder to the vicar.

The Ordnance Survey map of 1839 (Figure 12.4) indicates that the PDA was formed by all, or parts of six agricultural fields, with the northern extent formed by a townland boundary between Isertkelly North and Ballinla; likewise, the public road to the south acts as a townland boundary. There are no indications of any structures within, or in the immediate area of the PDA.

Griffith's Valuation (*Primary Valuation of Ireland 1848-64*) of 1856 notes that the entire townland of Isertkelly North was owned by Dudley Persse but was separate from the Castleboy Demesne/Roxborough Estate lands. In that regard, the latter lands were largely bounded by a stone wall bonded with mortar, sections of which are still partially extant along the southern edge of the public road to the south of the PDA – Plate 12.1.

Plate 12.1 Example of former Estate Wall to Castleboy Demesne/Roxborough Estate

The Ordnance Survey map of 1922 (Figure 12.5) indicates that the PDA lands were still in agricultural use, with some marshy area indicated in the centre; the northern extent was formed by three fields, with that to the south now formed by a single large field.

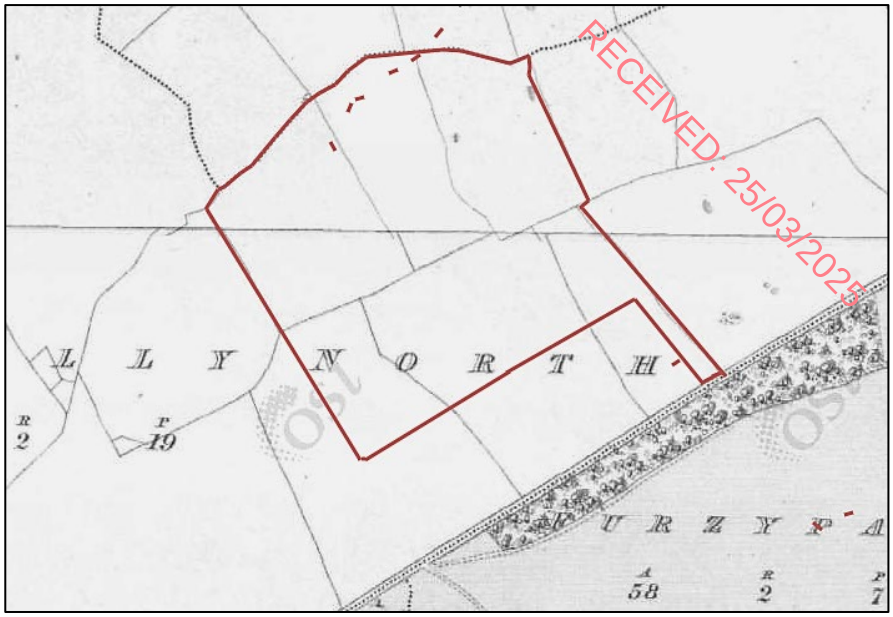

Figure 12.4 Extract from Ordnance Survey Map of 1841

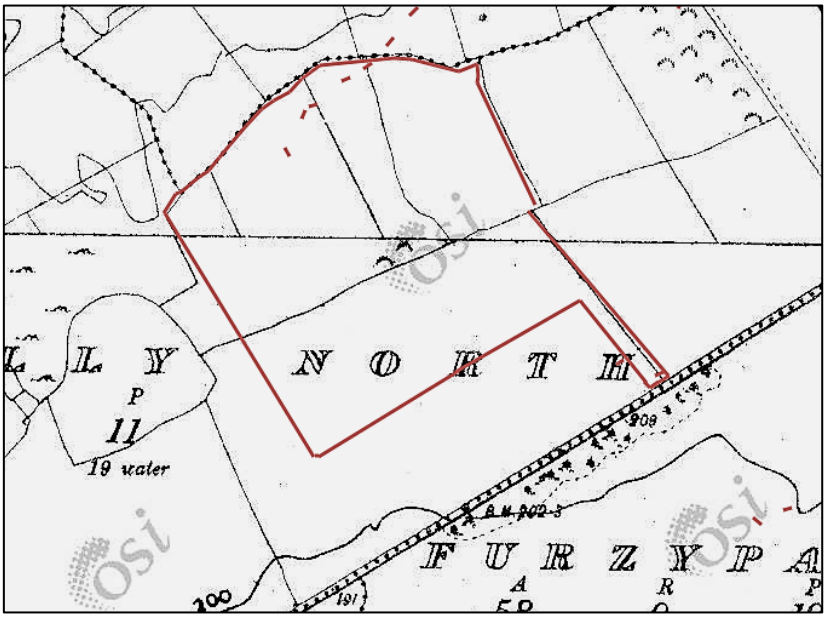

Figure 12.5 Extract from Ordnance Survey Map of 1922

A number of private and agricultural-related residential plots were subsequently developed fronting onto the public road to the south, and outside the extent of the PDA. Further changes were made to the field division boundaries, resulting in the present layouts which, within the extent of the PDA, comprises all, or parts of seven individual fields (Plate 12.2), with the boundaries largely formed by simple dry-stone walls (Plate 12.3). In addition, a quarry was developed in the adjacent townland of Ballinla by Roadstone around 2000, following which the existing quarry, within the PDA, was opened in 2007.

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Plate 12.1 Aerial View of Site and immediate environs

Plate 12.2 Example of drystone wall field boundaries within PDA

12.3.2 Archaeological Heritage

12.3.2.1 Introduction

Archaeology is the study of past societies through their material remains and the landscapes they lived in. "The archaeological heritage consists of such material remains (whether in the form of sites and monuments or artefacts in the sense of moveable objects) and environmental evidence" (DoAHG 1999, p9).

Archaeological heritage comprises all material remains of past societies, with the potential to enhance our understanding of such societies. It includes the remains of features such as settlements, burials, ships and boats and portable objects of all kinds, from the everyday to the very special. It also includes evidence of the environment in which those societies lived. The terms "site" or "monument" are used generally to refer to fixed structures or areas of

activity, as opposed to particular moveable objects. Historic wrecks are also part of the archaeological heritage (DHLG&H, 2021, 3).

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The area examined included the PDA (application red-line boundary), as well as an area of c. 1000m surrounding the defined boundaries of the site, where possible.

The area under assessment is part of a landscape which is rich in historical and archaeological material. The general region has attracted settlement from early times as evidenced by the presence of monuments dating back to the prehistoric period. Continuity of settlement is illustrated by artefacts dating to the Bronze Age and by identified monuments ranging from Neolithic to Medieval and Post-Medieval remains.

The siting preferences of particular monument types are well documented. Broadly speaking, the general landscape of the proposed development area offers a potential setting for the discovery of archaeological sites and remains, as follows:

- The general rolling nature of the landscape is a favoured position for the location of prehistoric burial sites, ringforts and enclosure sites in the general region surrounding the subject development lands.
- The area's adjacent watercourses are a favoured landscape for Fulachta Fiadh (prehistoric cooking sites). In addition, these features generally occur in groups

12.3.2.2 Statutory Protections and Relevant National Policies

The statutory and administrative framework of development control in zone of archaeological potential or in proximity to recorded monuments has two main elements:

(a) Archaeological preservation and licensing under the National Monuments Acts/ Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023 and

(b) Development plans and planning applications under the Planning Acts.

❖ National Monuments Acts 1930-2004

Section 12 (1) of the National Monuments (Amendment) Act, 1994 provides that the Minister for the Environment, Heritage and Local Government 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 to each county of the State. This is referred to as the 'Record of Monuments and Places' (RMP), and monuments entered into it are referred to as 'Recorded Monuments'.

Section 12(3) of the National Monuments (Amendment) Act 1994 provides for the protection of monuments and places in the record, stating that

"When the owner or occupier (not being the Minister) of a monument or place which has been recorded under subsection (1) of this section or any person proposes to carry out, or to cause or permit the carrying out of, any work at or in relation to such monument or place, he shall give notice in writing of his proposal to carry out the work to the Minister and shall not, except in the case of urgent necessity and with the consent of the Minister, commence work for a period of two months after having given the notice".

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❖ Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023

This Act (October 2023) repeals the National Monuments Acts 1930 to 2004 and replaces those Acts with provisions for the protection of historic heritage, provisions for the protection of archaeological heritage, provisions for the regulation of certain activities in the interests of such protection and provisions enabling the State to ratify or accede to certain international conventions which relate to such protection or regulation; to give effect to the EIA Directive and the Habitats Directive in relation to the carrying out of works at, on, in, under, to, or within the immediate surroundings of monuments; to give further effect to the Valletta Convention; to consequentially repeal or amend certain other enactments; and to provide for related matters.

The Act contains a range of provisions that seek to streamline and simplify existing systems and processes, including the automatic legal protection for finds of archaeological sites, a system of civil enforcement to be used as an alternative to, or to supplement criminal proceedings, and an appeal process for license applications.

In terms of monument protections, the key change will be the creation of a single Register of Monuments to replace the statutory Record of Monuments and Places (RMP) and the non-statutory Sites and Monuments Record (SMR); two levels of protection are provided, Special and General, and automatic protection will be afforded newly discovered monuments.

Although the Act has been signed into law, it will be enabled on a phased basis and the provisions of the National Monuments Acts 1930 – 2014 are still in force.

❖ Galway County Development Plan 2022-2028

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The following relevant Archaeological Heritage Objectives are set out in Section 12.6 of the Plan:

ARC 4	**Protection of Archaeological Sites** Protect archaeological sites and monuments their settings and visual amenity and archaeological objects and underwater archaeological sites that are listed in the Record of Monuments and Places, in the ownership/guardianship of the State, or that are subject of Preservation Orders or have been registered in the Register of Historic Monuments, or that are newly discovered and seek to protect important archaeological landscapes.
ARC 5	**Development Management** All planning applications for new development, redevelopment, any ground works, refurbishment, and restoration, etc. within areas of archaeological potential or within close proximity to Recorded Monuments or within the historic towns of County Galway will take account of the archaeological heritage of the area and the need for archaeological mitigation.
ARC 9	**Recorded Monuments** Ensure that any development in the immediate vicinity of a Recorded Monument is sensitively designed and sited and does not detract from the monument or its visual amenity.
ARC 10	**Zones of Archaeological Potential** To protect the Zones of Archaeological Potential located within both urban and rural areas and around archaeological monuments generally as identified in the Record of Monuments and Places. Any development within the ZAPs will need to take cognisance of the potential for subsurface archaeology and if archaeology is demonstrated to be present appropriate mitigation (such as preservation in situ/buffer zones) will be required.

In addition, the following Archaeological Heritage related Development Management Standard in included in Chapter 15 of the Plan:

DM Standard 61: Archaeological Conservation and Preservation (Urban & Rural Areas)

The National Monuments Acts 1930-2004 provide for the protection of archaeological heritage, including the establishment of a Record of Monuments and Places (RMP), which is a national inventory of archaeological sites and monuments. Some archaeological sites and monuments may also be of significant architectural heritage value and afforded dual protection as a Recorded/National Monument under the National Monuments Acts and as a protected structure under the Planning and Development Acts.

The Department of Arts, Heritage and the Gaeltacht's full database of archaeological monuments can be accessed at www.archaeology.ie

In considering proposals for development, applicants are advised to consult the Archaeological Constraints Maps (available for viewing in the Planning Department) in order to ascertain whether their development is located in an area of archaeological potential. Developers are strongly advised to have pre-application discussions if their site is located in such an area. All planning applications for new development, redevelopment, any ground

works, refurbishment and restoration, etc. within areas of archaeological potential or within close proximity to Recorded Monuments or within the historic towns of County Galway (Ardrahan, Athenry, Dunmore, Eyrecourt, Loughrea and Tuam) will take account of the archaeological heritage of the area and the need for archaeological mitigation. Any persons proposing to carry out works at or in relation to a recorded monument must give 2 months written notice to the Minister for Arts, Heritage and Gaeltacht (DAHG).

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Developers should give due consideration to the following:

- *Archaeology & Development: Guidelines for Good Practice for Developers;*
- *Framework and Principles for the Protection of Archaeological Heritage, DAHG* (1999).

12.3.2.3 Archaeological Inventory

The Archaeological Survey of Ireland (ASI) inventory database is known as the Sites and Monuments Record (SMR). The SMR contains details of all monuments and places (sites) where it is believed there is a monument known to the ASI pre-dating AD 1700 and also includes a selection of monuments from the post-AD 1700 period. The Record of Monuments and Places (RMP) (Section 12.3.2.2 above) is a subset of the SMR; monuments included in the RMP are legally protected and are generally referred to as “Recorded Monuments”. The addition of a monument to the ASI SMR database does not, of itself, confer legal protection. The reclassification of a monument does not affect its legal status in any way.

There are no previously identified monuments located within the PDA and no surface traces of archaeological potential were noted by an examination of historic maps, aerial photographs of satellite imagery (e.g. Google Maps and Bing Maps); likewise, no surface traces of potential interest were noted by the surface reconnaissance surveys undertaken within the PDA and overall landholding.

There are fifteen previously documented monuments located within the wider defined study area (Section 12.2.1 above), some of which comprise more than one element – SITES CH-3, CH-4, CH-6, CH-8, CH-11, CH-12 and CH-13. These are listed below in Table 13.1. All the monuments are included in the RMP (Figure 12.6), apart from CH-11(B) (SMR No: GA114-054002; Enclosure) and one element of SITE CH-13 (SMR No: GA114-054) is a National Monument.

The monument classifications and descriptions are included in Appendix 12.2 and Appendix 12.3, respectively.

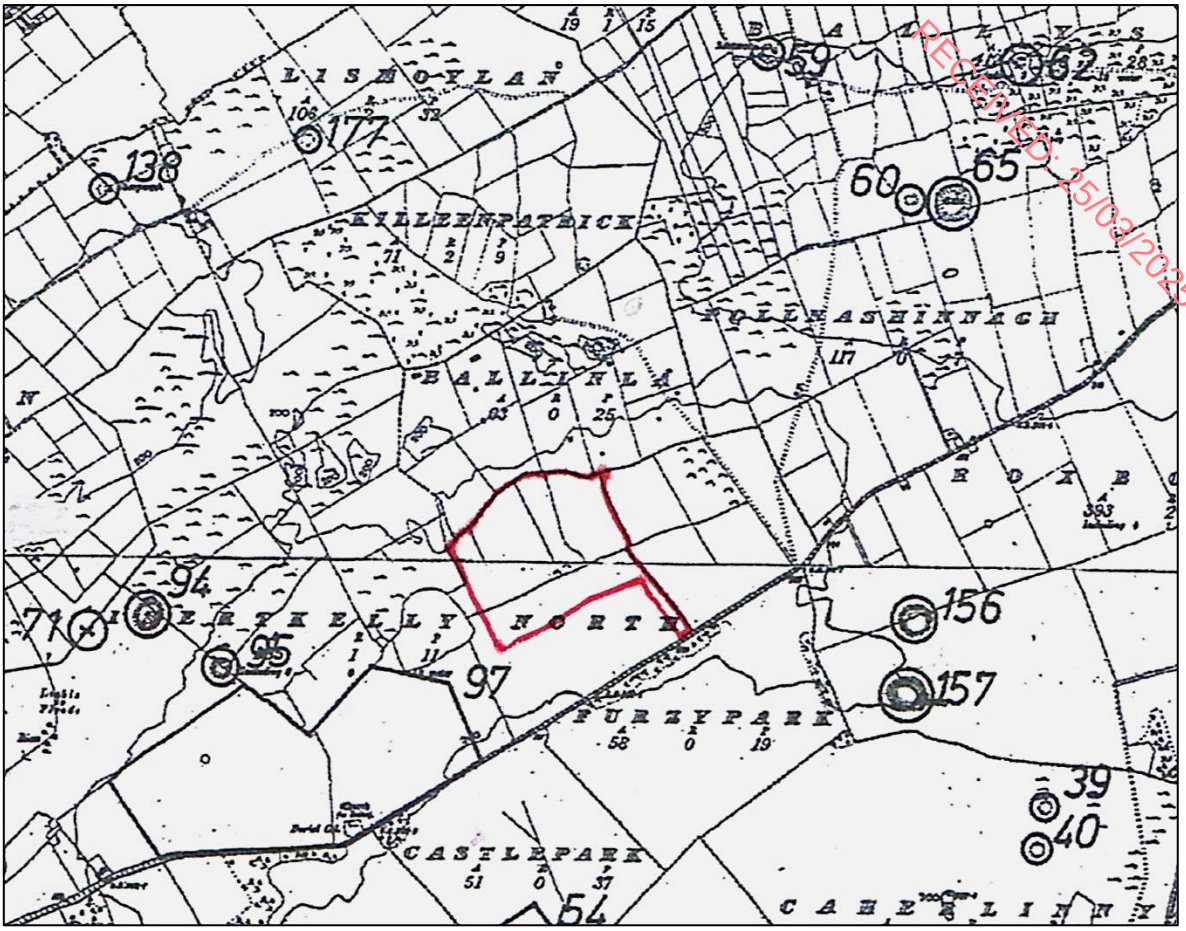

Figure 12.6 Extract from RMP (Galway Sheets 104 & 114) indicating locations of RMP Monuments and established RMP Zones within defined study area

The following abbreviations/codes are used in relation to **Table 13.1**:

- **Site No.**: Individual site number assigned to site with respect to the defined study area
- **SMR No**.: Individual number assigned to site in the Sites and Monuments Record (SMR) of the Archaeological Survey of Ireland
- **ITM**: International Transverse Mercator Grid Reference (centre of monument)
- **Classification:** Brief nature of the archaeological site as listed in the SMR
- **DMS:** Deserted Medieval Settlement
- **NM:** National Monument
- **RMP**: Listed in the Record of Monuments and Places
- **Distance:** Distance between RMP Zone and extent of PDA

Site No.	SMR No.	ITM	Classification	Townland	Protection	Distance
CH-1	GA104-138	550962 713991	Ringfort - rath	Fiddaun	RMP	1065m
CH-2	GA104-177	551417 714094	Ringfort - rath	Lismoylan	RMP	840m
CH-3	GA104-059 GA104-059001	552456 714292	Ringfort – rath Souterrain	Ballyshea	RMP	968m
CH-4	GA104-062 GA104-062001	553023 714268	Ringfort – rath Souterrain	Ballyshea	RMP	1262m
CH-5	GA104-060	552772 713956	Barrow – mound barrow	Ballyshea	RMP	877m

CH-6	GA104-065 GA104-065001	552872 713950	Ringfort – rath Souterrain	Ballyshea Pollnashinnagh	RMP	940m
CH-7	GA114-156	552787 713001	Ringfort - rath	Roxborough	RMP	477m
CH-8	GA114-157 GA114-157001	552772 712840	Ringfort – rath Souterrain	Boxborough	RMP	540m
CH-9	GA114-039	553080 712581	Ringfort - rath	Caherlinny	RMP	830m
CH-10	GA114-040	553061 712489	Ringfort - rath	Caherlinny	RMP	861m
CH-11	GA114-054 GA114-054001 GA114-054002	551916 712190 551873 712292	Tower House (A) Bawn (A) Enclosure (B)	Castlepark	NM RMP	551m
CH-12	GA114-097001 GA114-097002 GA114-097003	551525 712543 551461 712651 551525 712543	Church (B) DMS (A) Graveyard (B)	Isertkelly North	RMP	230m
CH-13	GA114-095 GA114-095001	551229 712905	Ringfort – rath Souterrain	Isertkelly North	RMP	523m
CH-14	GA114-094	551064 713026	Ringfort - rath	Isertkelly North	RMP	636m
CH-15	GA114-071	550990 713054	Ringfort - rath	Fiddaun Isertkelly North	RMP	722m

Table 12.1 Archaeological Inventory

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Note: The RMP Zone established for SITE CH-12 is not indicated in the Historic Environment Viewer (HEV) – www.archaeology.ie; this indicates an SMR Zone of Notification (ZoN) for SMR Nos GA114-097001 (Church) and GA114-097003 (Graveyard) and a point-location for GA114-097002 (Deserted Medieval Settlement) – see Figure 12.10.

12.3.2.4 Archaeological Artefacts

A search of the Topographical Files of the National Museum of Ireland indicates that no 'stray' finds are listed for the townland of Isertkelly North.

12.3.2.5 Results from Documented Archaeological Investigations within Study Area

A review of the Archaeological Excavations Database (www.excavations.ie) and the files of the NMS indicate that no previously licenced archaeological investigations have been undertaken within the extent of the PDA or wider landholding; however, a number of investigations have been undertaken in the environs of the lands, as follows:

- Investigations by Martin Fitzpatrick (Licence No: 04E1117) were undertaken within the RMP Zone established for GA114-097 (Site CH-12); The stratigraphy revealed in trenches was similar and consisted of sod and topsoil, 0.1–0.2m in depth overlying bedrock. No features of archaeological significance were encountered.
- Topsoil-stripping with respect to the quarry to the immediate north (Ballinla Td) of the subject PDA was undertaken in 2001 and 2002 by Anne Carey (Licence No: 01E0167);

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nothing of archaeological significance was discovered; a denuded field-clearance cairn was surveyed and its removal was monitored.

- Additional, unlicensed, monitoring of topsoil stripping associated with the above quarry at Ballinla was undertaken by Charles Mount in 2007; nothing of archaeological interest was uncovered.
- investigations have also previously been undertaken to the south of the site, at the tower house known as Isert Kelly Castle (GA114-054; SITE CH-11). These excavations (E4548) are part of a research project being conducted by Dr Rory Sherlock (2023) for the Galway Archaeological Field School. The work began in 2014 with the most recent investigations carried out in 2024.

12.3.2.6 Results from Site Specific Geophysical Survey

A Geophysical Survey of the overall PDA, together with lands to the immediate west and northwest, where possible, was undertaken by Archaeological Consultancy Services Unit Ltd (ACSU) under licence 24R0573 issued by the Department of Housing, Local Government and Heritage; a total of eight fields were surveyed, with the PDA comprising all of Fields 1 – 4, together with the eastern halves of Fields 5 and 6. The survey was conducted using a Bartington GRAD 601-2 dual-sensor fluxgate gradiometer system mounted on a GPS-based non-magnetic cart system with four mounted sensors, with a sample interval of 0.25m and a traverse interval of 1m, with variations in the magnetic field between -100nT to +107.834nT.

The results (grey-scale) of the survey are illustrated below in Figure 12.7 and an interpretative plan illustrated in Figure 12.8.

A number of anomalies were detected, as described below in Table 12.2

Anomaly No:	Form/Nature of Anomaly	Possible Source(s) of Anomaly	Description
N/A	Archaeology (?)	Possible pits ,postholes, kilns, cut features, spreads/deposits	Sporadically occurring anomalies throughout the survey area that may represent features of archaeological significance but may also be natural in origin.
N/A	Linear Feature	Former field boundary	A southwest to northeast aligned positive linear anomaly located to the south of Field 8 that corresponds with a former field boundary depicted on the First edition Ordnance Survey (OS) 6-inch map, surveyed in 1837.
N/A	Linear Feature	Agricultural Tillage	A series of parallel positive linear anomalies in Field 2 that represent scarring from agricultural tillage.

Table 12.2 Descriptions & Interpretations of Detected Geophysical Anomalies

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Figure 12.7 Grey-scale results of Geophysical Survey

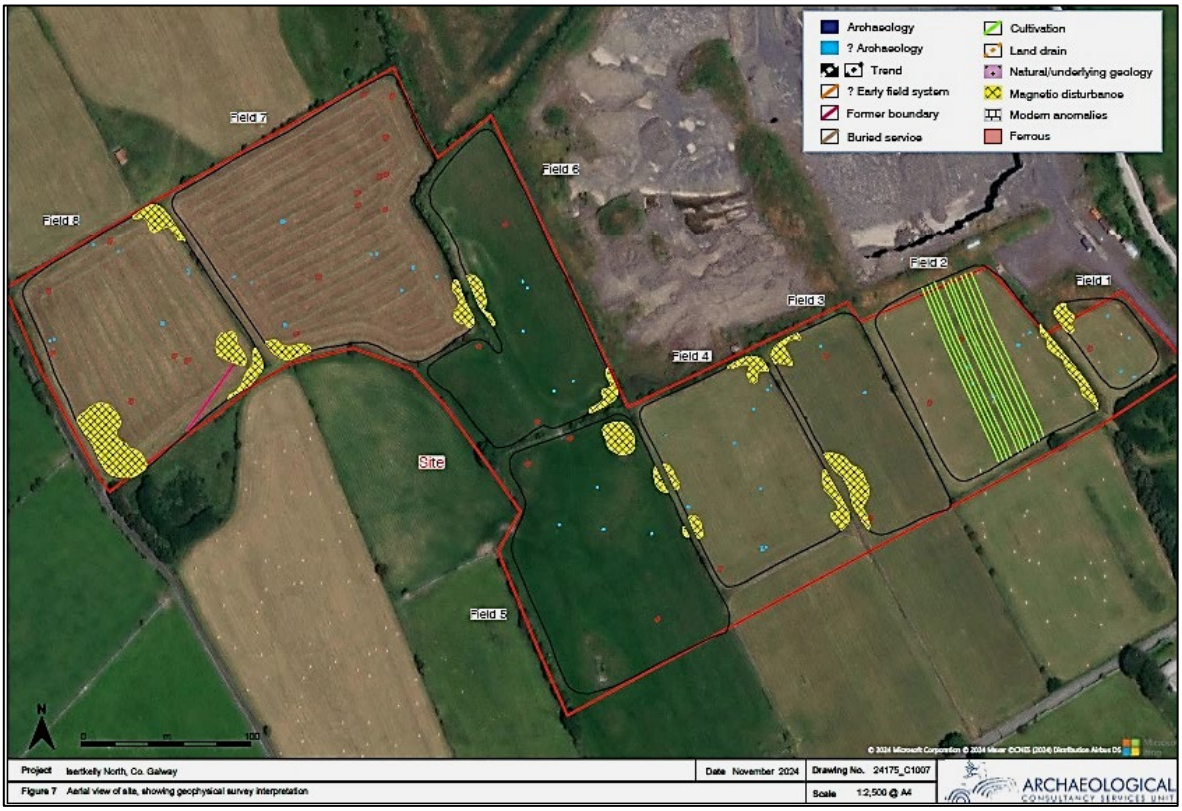

Figure 12.8 Interpretation Plan of Geophysical Survey Results

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12.3.2.7 Results of PDA-Specific Archaeological Testing

A programme of intrusive Archaeological Testing was undertaken within the extent of the subject PDA Lands in mid-January 2025 and under licence (Ref: 25E0022) from the Department of Housing, Local Government & Heritage. The primary aim of the testing was to determine the archaeological nature of the anomalies detected by the Geophysical Survey within such lands, as well as to collate some physical background information concerning the general nature of the archaeological potential of the lands.

A total of twenty-nine trenches, of varying lengths and orientations, were excavated, the locations of which are illustrated below in Figure 12.9. All trenches were excavated by machine fitted with a 1.5m-wide toothless bucket, following which the sides and bases of the trenches were visually examined; the positions of the detected geophysical anomalies were further cleaned by hand using a hoe and the resultant spoil was 'raked-through' to increase the chances of artefact recovery. In addition, in some trenches the subsoil was also excavated to a shallow depth in order to determine, with certainty that no subsurface features of archaeological interest existed within the areas of testing.

The results of the testing programme are contained in Appendix 12.4. In summary, the testing programme indicated the topsoil was relatively shallow across the testing area (generally 100 – 150mm in thickness) and that the subsoil contained concentrations of large stones and boulders. No subsurface features of archaeological interest were uncovered and no artefacts of archaeological/historical interest were recovered.

Figure 12.9 Locations of Archaeological Test Trenches

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12.3.3 Architectural Heritage

12.3.3.1 Introduction

Architectural heritage has several definitions and meanings for people. The definition set out in the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 1999 states that "architectural heritage" means all-

a. Structures and buildings together with their settings and attendant grounds, fixtures and fittings,
b. Groups of such structures and buildings, and
c. Sites, which are of architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest.

12.3.3.2 Architectural Inventory

A. Record of Protected Structures

Section 51 of the Planning and Development Act, 2000 (as amended) requires a Development Plan to include a record of structures which form part of the architectural heritage of the County and are to be protected. County Councils draw up these lists, referred to as the Record of Protected Structures (RPS). The RPS is a section of a Development Plan in which each structure is given a reference number

There are no protected structures within the meaning of the Planning and Development Act, 2000 situated within the boundaries of the PDA or wider Defined Study Area.

B. National Inventory of Architectural Heritage

The National Inventory of Architectural Heritage (NIAH) is a state initiative under the administration of the Department of Housing, Local Government and Heritage. It was established on a statutory basis under the provisions of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999. Its purpose 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. It is intended that the NIAH will provide the basis for the recommendations of the Minister for Housing, Local Government and Heritage to the planning authorities.

There are no structures identified by the NIAH as being located within the boundaries of the PDA or wider Defined Study Area.

C. Unrecorded Sites/Features of Architectural Heritage Interest

There is one site located immediately outside the extent of the PDA which is considered to be of Architectural Heritage Interest, but which is not subject to any protections or designation. The feature is a Water Pump positioned to the immediate east of the existing site entrance from the local public road (ITM: 552287 712985); its location (Isertkelly North Td) is indicated in Figure 12.10 as SITE CH-16 and it is described in Appendix 12.3.

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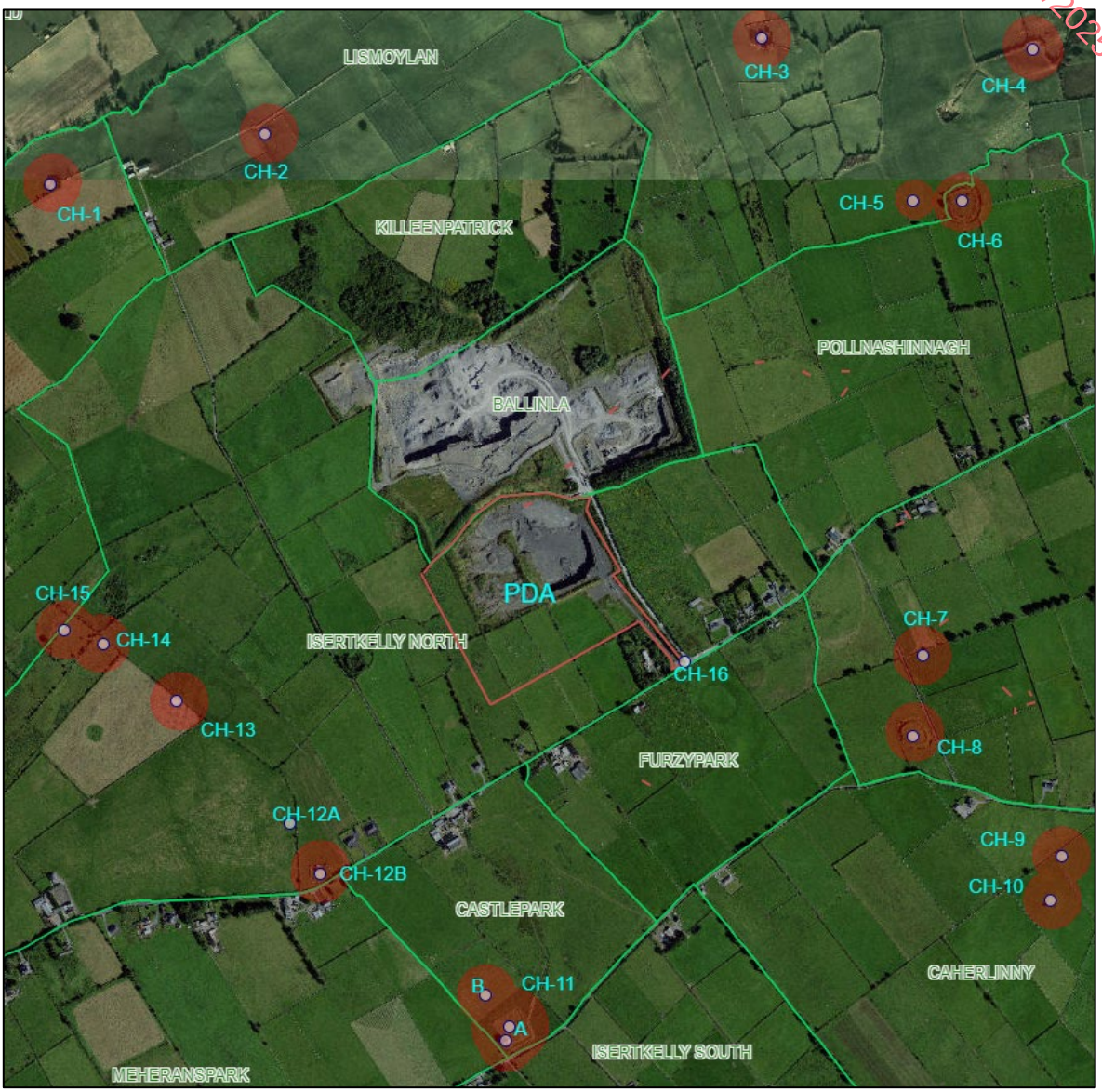

Figure 12.10 Locations of Cultural Heritage Sites Identified Within Defined Study Area

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12.4 POTENTIAL IMPACTS

12.4.1 Site Preparation Stage

12.4.1.1 Local History

The general historical background to the subject development area was introduced above in Section 12.3.1. In summary, there are no significant historical events or associated topographical/physical features associated with the PDA or immediate environs which have the ability to be impacted upon by the proposed development.

12.4.1.2 Archaeological Heritage

The general archaeological background to the subject development area was introduced above in Section 12.3.2.

In summary, as noted in Section 12.3.2.2, there are fifteen previously recorded monuments/groups of monuments, identified on the basis of the Paper Survey, located within the defined Study Area, none of which are located within the extent of the PDA; the nearest monuments to the PDA is SITE CH-12 (A) – SMR No: GA114-097002; Deserted Settlement – Medieval), the closest extent of the RMP Zone of which is located approximately 240m to the southwest (Figure 12.6).

No additional sites or features of archaeological potential were noted by an inspection of historic maps, aerial photographs or satellite imagery; likewise no surface features of archaeological interest were noted by surface reconnaissance surveys of the site.

The extent of the PDA and part of the wider landholding was the subject of a Geophysical Survey, as discussed above in Section 12.3.2.6. A small number of anomalies were detected, most of which were interpreted as deriving from natural/geological sources or agricultural-related activities. A subsequent programme of intrusive archaeological testing did not uncover any subsurface remains of archaeological interest or potential.

Given the foregoing, it is considered that there is no potential for the discovery of hitherto unrecorded subsurface archaeological features and that no impacts to Archaeological Heritage will occur by works associated with the Site Preparation/Development Phase.

12.4.1.3 Architectural Heritage

As discussed above in Section 12.3.2.3, there are no protected structures, within the meaning of the Planning and Development Act, 2000, or NIAH-listed structures, situated within the extent of the PDA or wider Defined Study Area.

One unrecorded feature located immediately outside the extent of the PDA which is considered to be of Architectural Heritage Interest, but which is not subject to any protections or designation. The feature is a Water Pump (SITE CH-16) positioned to the immediate east

of the existing site entrance from the local public road – Plate 12.4; it is set back from the road edge on a raised stone platform and bounded by walls.

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No additional works to the entrance are required of the subject development and it is considered that no physical impacts to the feature will occur as a results of the development proceeding.

Plate 12.4 SITE CH-16 from south

12.4.2 Operational Phase

12.4.2.1 Local History

The general historical background to the subject development area was introduced above in Section 12.3.1. In summary, there are no significant historical event-features associated with the PDA lands which have the ability to be impacted upon by the proposed development.

12.4.2.2 Archaeological Heritage

The general archaeological background to the subject development area was introduced above in Section 12.3.2. In summary, there are no previously recorded monuments within the extent of the PDA or immediate environs.

There are fifteen previously recorded monuments/groups of monuments, identified on the basis of the Paper Survey, located within the defined Study Area, some of which have extant elements but cannot be viewed from the PDA due to existing topographical nature of the intervening lands. The only monument which can be viewed from the PDA is CH-11(A) – SMR NO: GA114-054; Castle-Tower House – as illustrated in Plate 12.5; however, the tower house and associated bawn are located at a distance of 650m from the nearest extent of the PDA and, consequently, it is considered that no impacts to the setting of the monument will occur and that any impacts on the views from the tower house will be insignificant and temporary, albeit of long duration.

Plate 12.5 SITE CH-11(A) as viewed from southwest corner of PDA

12.4.2.3 Architectural Heritage

There are no protected structures, within the meaning of the Planning and Development Act, 2000, or NIAH-listed structures situated within the boundaries of the proposed development lands or wider Defined Study Area.

One previously unrecorded feature of architectural heritage interest was noted; the feature is a Water Pump (SITE CH-16) positioned between the vehicular entrances to the two existing quarries – Plate 12.4 above. It is considered that no additional impacts to the setting of this feature will occur as a result of the development proceeding.

12.4.3 Potential Cumulative Impacts

It is not considered that the cumulative effect of the proposed development will cause any increased impacts to identified sites of Cultural Heritage interest. This is due to the locations of such sites with respect to the subject development lands and the existing nature of such sites.

12.5 MITIGATION MEASURES

12.5.1 Site Preparation/Development Phase

12.5.1.1 Local History

There are no potential impacts on any on sites features or areas of historical interest. Consequently, no mitigation measures are considered.

12.5.1.2 Archaeological Heritage

There are no previously recorded monuments located within the extent of the PDA and no subsurface features were uncovered during the programme of Archaeological Testing, the trench layout of which was guided by a Geophysical Survey.

It is considered that the PDA lands are of no archaeological potential and, consequently no mitigation measures are deemed necessary.

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12.5.1.3 Architectural Heritage

As noted above in Section 12.3.3 there are no protected structures, within the meaning of the Planning and Development Act, 2000, or NIAH-listed structures, situated within the boundaries of the PDA or wider study area.

A previously unrecorded/undesignated feature of interest (SITE CH-16: Water Pump) is located between the roadside entrances to the two existing; as noted above in 12.4.1.3, it is considered that no physical impact on this feature will occur as a results of the development proceeding; consequently, no mitigation measures are necessary.

12.5.2 Operational Phase

12.5.2.1 Local History

The general historical background to the subject development area was introduced above in Section 12.3.1. In summary, there are no significant historical event-features associated with the proposed development lands which have the ability to be impacted upon by the proposed development. Consequently, no mitigation measures are deemed necessary.

12.5.2.2 Archaeological Heritage

The general archaeological background to the subject development area was introduced above in Section 12.3.2. In summary, there are no previously recorded monuments within the extent of the PDA or immediate environs.

There are fifteen previously recorded monuments/groups of monuments, identified on the basis of the Paper Survey, located within the defined Study Area, some of which have extant elements but cannot be viewed from the PDA due to existing topographical nature of the intervening lands. The only monument which can be viewed from the PDA is CH-11(A) – SMR NO: GA114-054; Castle-Tower House – as illustrated in Plate 12.5 above; however, the tower house and associated bawn are located at a distance of 650m from the nearest extent of the PDA and, consequently, it is considered that no impacts to the setting of the monument will occur and that any impacts on the views from the tower house will be insignificant and temporary, albeit of long duration.

Given the foregoing, it is considered that no mitigation measures are necessary.

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12.5.2.3 Architectural Heritage

As noted above in Section 12.3.3 there are no protected structures, within the meaning of the Planning and Development Act, 2000, or NIAH-listed structures, situated within the boundaries of the PDA or wider study area.

A previously unrecorded/undesignated feature of interest (SITE CH-16: Water Pump) is located between the roadside entrances to the two existing quarries; as noted above in 12.4.2.3, it is considered that no increased visual/setting impact on this feature will occur as a results of the development proceeding; consequently, no mitigation measures are necessary.

12.6 PREDICTED RESIDUAL IMPACTS

12.6.1 Construction Phase

There are no predicted impacts in terms of Cultural Heritage.

12.6.2 Operational Phase

There are no predicted impacts in terms of Cultural Heritage.

12.6.3 Cumulative Impact

There are no predicted impacts in terms of Cultural Heritage.

12.6.4 'Worst-Case' Scenario

Given the nature of the PDA lands, the historical background, results of intrusive archaeological investigations and the locations of monuments/structures of archaeological and architectural heritage interest within the overall study area, it is considered that there are no predicted 'worst-case' scenarios from the perspective of Cultural Heritage.

12.7 MONITORING AND REINSTATEMENT MEASURES

Post-development monitoring issues or reinstatement measures with respect to cultural heritage are not considered a requirement with respect to the subject development.

12.8 INTERACTIONS

It is considered that the development will not have any impacts with respect to overall Cultural Heritage. Consequently, there will be no interactions with any other aspects of the environment.

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CHAPTER 13

LANDSCAPE & VISUAL

IMPACT ASSESSMENT

RMDA
LANDSCAPE ARCHITECTS + CONSULTANTS

12 THE LANDSCAPE and VISUAL IMPACT ASSESSMENT

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12.1.0 Introduction

This Landscape and Visual Impact Assessment (LVIA) prepared by Ronan MacDiarmada & Associates Ltd (RMDA) was informed by a desktop study and a survey of the site and receiving environment in November 2024. The assessment is in accordance with the methodology prescribed in the Guidelines for Landscape and Visual Impact Assessment, 3rd edition, 2013 (GLVIA) published by the UK Landscape Institute and the Institute for Environmental Management and Assessment.

The report identifies and discusses the impact the proposed development at Kilchreest, Galway has on the existing Landscape or environment.

RMDA has been commissioned by Isertkelly Ltd. , to prepare a Landscape and Visual Impact Assessment to accompany a submission on the subject lands for a quarry at Kilchreest.

This assessment should be read in conjunction with Images that have been prepared for the scheme (refer to the proposed views for photos in attached report), which should also be read in conjunction with this report.

Fig 01.- Landscape Masterplan.

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12.1.2 Statement of Authority

RMDA provides specialist landscape and visual services for projects from inception, through site/route selection, environmental impact assessment (EIA) and the planning process, to detailed design and construction. The company specialises in landscape character assessment (LCA) and landscape and visual impact assessment (LVIA) – for a wide variety of projects.

Ronan MacDiarmada is the chapter's main author, and Peter Lynch, Landscape Architect provided oversight and review. Ronan MacDiarmada, B.Agr. Sc. (Land. Hort.) is the director of Ronan MacDiarmada & Associates Ltd and is graduate of University College Dublin. He is a qualified Landscape Architect and a Corporate Member of the Irish Landscape Institute. He has specialised in Landscape and Visual Assessment (LVIA) and has over twenty years of experience in a range of projects, from large scale strategic design, master planning and detailed design to LVIA and landscape planning, including Strategic Housing Developments throughout Ireland.

12.2.0 Methodology Used

Landscape and Visual Assessment Methodology: -

This assessment is based on the following guidelines:

- "Advice Notes on Current Practice in the preparation of Environmental Impact Statements", Environmental Protection Agency (2015)
- "Guidelines on the Information to the Contained in Environmental Impact Statements", Environmental Protection Agency (2002).
- "*Draft 2017 EPA Guidelines on Environmental Impact Assessment", Environmental* Protection Agency.
- "Advice Notes for Preparing Environmental Impact Statements" Draft (September 2015)
- *"Guidelines for Landscape and Visual Assessment"*, 3rd Ed., Landscape Institute and Institute of Environmental Management and Assessment, 2013.

The following Methodology was used in this assessment:

1. A desk top study of the proposed site and its environs, including reviewing aerial photography and ordinance survey documents.
2. A site survey was undertaken to determine the character of the landscape and

the surrounding area, including site visits during the month of September 2024.

3. An assessment of the proposed development was carried out by examining the layout plans, elevations, and sections to determine the impacts of the development.
4. An evaluation of these impacts was carried out in accordance with the criteria set out in the EPA guidelines.
5. A review of statutory planning and other documentation in order to ascertain the local and wider significance; and visiting the site and surrounding area during September and preparing a photographic record of views and landscape features.

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12.2.1 Definition of Landscape

Ireland is a signatory to the European Landscape Convention (ELC). The ELC defines landscape as

'an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors'.

This definition is important, as it defines that the landscape is not only a physical and visual amenity but provides for a range of functions: As a cultural resource, the interaction of man and landscape has formed the basis of much of our cultural heritage and values. The rhythms of the land as it was settled has informed what Kilchreest is today. The landscape provides opportunities for passive and active recreation. It contributes to the sense of place, as over time and place various histories and interactions have formed a sense of place for the local populations. The landscape provides a historic record, it also is a resource for food production, sources of energy and in the natural cycle, oxygen, water. as the source for materials for living. In particular the landscape has the ability to renew itself.

Kilchreest and its environs is that of a rural setting and this is defined in GLVIA-2013 in the following manner (Section 2.2):

"Landscape is about the relationship between people and place. It provides the setting for our day to day lives. The term does not mean just special or designated landscapes and it does not only apply to the countryside"

12.2.2 Forces for Landscape Change

Landscape in Kilchreest, Co. Galway is not unchanging. It has changed with the settlement pattern over the last several hundred years. It has

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progressed from wilderness to agriculture and settlement. The patterns of settlement have been driven primarily by economic need and the requirement to provide shelter and a food resource. In this frame, it has to be accepted that change shall occur and it requires finding an appropriate balance between economic, social and environmental forces and values.

In this the landscape proposals have focused on the existing hedgerows and the retention and augmentation of same. This is done to minimise visual impact, create and retain existing habitats. It is wished to retain the sense of value and place in the location in which local residents work and reside. This shall encourage the growth of community in Kilchreest. Although there is a quarry in existence, the proposed application deals with extension of the quarry. Therefore, it follows an existing pattern of development in the area, the landscape shall be respected in the form of retention of existing hedgerows and the reintroduction of habitat areas. The proposal is set back from the road, it is part of an existing quarry and adjacent to an active quarry (Roadstone) to the north.

There has been considerable quarrying activity in this area, with an existing quarry and adjoining quarry to the north. While the quarry itself may be screened from public roads, the dust created by vehicles emerging from the quarry is clearly evident and creates an adverse visual impact.

12.2.3 Nature of Impacts

Impact on landscape arising from development has two distinct but closely related aspects. The first is impact in the form of change to character of the landscape that arises from the excavation of the existing landform and the proposed quarry into the existing context. The second aspect is the visual impact; which depends on the degree and nature of change in the visual environment. It is recognised that the combined impact on character and views will draw responses, the significance of which will be partly informed by an individual's subjective perception of how much the changes matter.

The assessment of landscape/Landscape and visual impacts include:

- Direct impacts upon specific landscape elements and buildings within and adjacent to the site.
- Effects on the overall pattern of the landscape elements that give rise to the

character of the site and its surroundings. https://scanner.topsec.com/?d=107&r=show&u=https%3A%2F%2Fwe.tl%2Ft-YFFaXmfBrn&t=bc200196b86f4669930caacedbc7b0a248706585

- Impacts upon any special features or interests in or around the site. ▪ Direct impacts of the scheme upon views in the landscape.
- Overall impact on landscape character and visual amenity

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In determining the Visual Impacts, the following definitions were used to assess the significance of the impacts:

Table 1 - 1.2.4 Impact Significance Criteria.

No Impact:	There are no changes to views in the visual landscape.
Imperceptible Impact:	An impact capable of measurement but without noticeable consequences.
Slight Impact:	An impact which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Impact:	An impact that alters the character of the environment in a manner that is consistent with existing and emerging trends.
Significant Impact:	An impact which, by its character, magnitude, duration, or intensity alters a sensitive aspect of the environment.
Profound Impact:	An impact which obliterates sensitive characteristics.

Table 2 - Terms used to describe Quality of visual impact:

Neutral Impact:	A change which does not affect the quality of the landscape.
Positive Impact:	A change which improves the quality of the environment or landscape.
Negative Impact:	A change which reduces the quality of the environment or landscape.

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Table 3 - Terms used to describe the Duration of visual impact.

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Momentary Effects:	Seconds to Minutes.
Brief Effects:	Less than a day.
Temporary Effects:	Less than a year.
Short-term Effects:	Lasting 1 to 7 years.
Medium-term Effects:	Lasting 7 to 15 years.
Long-term Effects:	Lasting 15 to 60 years.
Permanent Effects:	Lasting over 60 years.
Reversible Effects:	Effects that can be undone.
Frequency of Effects:	Describe how often the effect will occur.

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12.3.0 Receiving Environment

1.3.1 Description of the Receiving Environment

The proposed development is in Kilchreest, and the site forms part of an existing quarry. There are currently site offices on the existing quarry

There are a few houses along the main road close to the proposed development at this location. There are no protected structures on the site, with the nearest protected structure 848.56 m to the south-east of the site and another 992.9m to the north-east of the site, both being ring forts. There shall be no impact upon these structures and visually cannot be seen from this location.

Fig. 02. - General Site Location and Study Area - Outlined in Red

Image 01 . Front entrance to the Plant

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Kilchreest is characterised as an open field system with existing native hedgerows and occasional stone walls. There are a number of quarries in the local vicinity and the subject site is directly adjacent to a Roadstone plant.

It is envisaged that this quarry shall provide material for the construction industry.

The local environment is agricultural in nature, although quarries and yards exist in the vicinity and is the obvious reason for the quarry activity in the locality, providing raw material, tarmacadam – stone for the construction industry.

The existing hedgerows and trees on the boundary shall be retained, however there is no grassland to be protected.

12.3.2 Policy Context of Receiving Environment

The historical character of the subject site shows how the landscape has been shaped by the interaction of man & landscape over time. The field systems and walls are a direct result of this activity.

The subject site is located within the landscape character area of Central Galway Complex Landscape.

The landscape value for the location of the quarry is of moderate value. The field systems are bounded by native hedgerows and trees and occasional stone walls. This fits with the description of the Central Galway Complex Landscape provided by Galway County Council – “an extensive plain of grasslands comprising medium-to-large fields with low enclosures and many areas of low stone walls. This area contains the majority of the county's population with associated high levels of rural housing, roads and settlements.”

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12.3.2 Protected Views

There are no protected views or scenic routes on or near the subject site.

12.3.3 Built Heritage.

The proposed lands at Kilchreest do not have buildings or archaeological items on the Record of protected Structures. The proposed has a moderate landscape value.

12.3.4 Implications of Development Plan Policy

The Development Plan identifies a number of Landscape Character Areas which should be considered as part of this Assessment. These include:

- Landform & Elevation Map of landscape Character Areas
- Historical Map of Landscape Character Areas
- Landscape Character Types
- Landscape Character Areas Map
- Landscape Values map
- Galway LCA: Central Galway Complex Landscape Type

The overall image of this landscape is one of agricultural land, albeit locally it has changed to an extraction industry of a quarry.

12.4.0 Summary of Landscape Characteristics and Values

12.4.1 Landscape Values

The GLVIA Guidelines sets out the methodology for assigning landscape sensitivity. This is based on combining judgements on landscape value, and landscape susceptibility.

Landscape values are derived from both indications of value as seen in national and local policy, as well as other indications that a landscape or landscape element, is valued. The site has a landscape character of moderate value.

In addition to formal designations at international, nation and local level, the GLVIA refers to criteria which can help to describe landscape values in landscapes that are not covered by designations. These include the following:

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• **Landscape Quality/Condition:** The location of the development is in a rural area, It is of moderate landscape value.

• **Cultural Heritage/Conservation value:** The proposed site is Galway LCA: Central Galway Complex Landscape Type – and is not part of a conservation area.

• **Aesthetic/Scenic Quality**: The site is in located in a rural area directly adjacent to an existing quarry – quarries.

• **Perceptual aspects**: A landscape may be valued for its perceptual qualities, such as wildness or tranquillity. The site consists of a filed system with a rising landform to the centre of the site.

• **Public Accessibility and Recreation Value**: The site is in private ownership and not publicly accessible.

• These values can further be categorised in two ways – values which should be conserved, and those that provide opportunity for enhancement. It is proposed to reinforce the concept of field boundary system.

12.4.2 Conservation Values

The conservation values indicate those aspects of the receiving environment which are sensitive and could be negatively impacted on by the proposed development. These values form the potential landscape and visual constraints to the proposed development.

Kilchreest has no protected structures or protected views/prospects and is not located in a conservation area. There is a Roadstone plant directly to the North of the subject lands.

The perimeter hedgerows shall all be retained and augmented. Where none is present, a new native hedgerow and trees shall be planted. Where no hedgerow is present, a landscape buffer of 5 – 8m is also proposed along the entire perimeter of the subject site. This shall add to the landscape quality –and provide for habitat renewal - adding and increasing the level of habitat of the environment.

12.4.3 Enhancement Values

The enhancement values reflect change that is occurring in the landscape and

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its inherent robustness.

These include:

• The proposed development is an extension of an existing quarry.

• The land is in this area has been traditionally used for Quarry development, with existing quarry/quarries adjacent to the proposed development.

• The proposed development retain and extend the existing hedgerows with a new landscape buffer of native tree planting proposed along the perimeter of the site.

12.5.0 Characteristics of the Proposed Development

The proposed development shall broadly comprise of an excavated Quarry extending to an existing Quarry. It shall be excavated for material for construction purposes.

The proposal shall be screened on all sides by existing and proposed hedgerows and trees. A further belt of trees and hedgerows shall be planted in a 5 – 8m wide belt surrounding the subject site.

The Soft Landscape proposals shall compliment the development aesthetically and functionally and shall tie in with the existing and surrounding landscape, providing Habitat spaces

It is intended to tie in with and assimilate the land into the local landscape befitting of its rural background, as follows:

1. To provide (reintroduce) habitat spaces with planting suitable to the local & new proposed environment.
2. To create new landscape features that will complement and enhance the Landscape.
3. To provide new landscape features in the form of a development that will significantly enhance and retain the character of the area.

12.5.0 Analysis

12.6.1 Likely Significant Impacts and Associated Mitigation Measures

12.6.2 Potential Visual Impact

The proposed development shall be temporarily negative initially – however, as there is ongoing quarrying, the impact shall be moderate as it is consistent with existing quarry activity as part of this

development & to the north. To ameliorate the impact, it is recommended retain existing hedgerow & trees and to plant the landscape buffer of trees and hedge as the first activity.

The visual impact close to the site within 250m, on the adjoining land shall be moderate, however from a distance it is screened by landform & vegetation impact as the trees and landscape buffer respects the natural attributes of the site.

The boundary shall be a well planted and shall provide screening in a short period which shall be a positive visual impact which shall be long term.

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12.6.3 Visual Impacts due to introduction of new structures & Buildings

There will be no introduction of any buildings. There shall be a protective security fence surrounding the entire boundary.

12.6.4 Visual Impacts due to access road

A small road is already in existence and shall be improved to provide access and egress for vehicles. There shall be no parking on the subject site and shall therefore will not impact upon the development. The main access road

Kilchreest quarry and access are in existence already and therefore there shall be no impact on the Landscape.

12.6.5 Visual impacts due to telecommunications/power lines

On this site, the development shall be served from existing services, telecommunications, and power lines. The services on site shall be underground. The opportunity to organise and reduce the telecommunication and services shall be utilised to reduce the visual impact, if any of the development.

12.6.6 Visual Impact of lighting

The lighting of the new development shall be limited and shall be typical of a similar quarry type. The lighting shall be for ongoing works and for security reasons.

Internally the spaces shall be lit by individual columns, which shall not alter materially the visual character of the landscape. The lighting shall benefit the workers, providing ability to find their way in safety. However Therefore, the impact of lighting on the existing landscape

shall be positive in the long term.

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12.6.7 Visual Impact of Landscaping Proposals

The landscape proposals shall consist of:

1. Retention and augmentation of existing hedgerows and trees on the boundary of the proposed quarry.
2. Planting of an extensive 5 – 8m wide landscape buffer around the perimeter of the subject lands to provide screening for the subject site in keeping with the surrounding Landscape

The landscape proposals for the landscape buffer shall include for a range of native trees and hedges. The flowering of these plants shall enable bees to flourish but also increase the texture and colour in the landscape. The introduction of the trees and hedge shall provide for habitat renewal, and this shall be a positive and long-term visual impact.

12.7.0 Avoidance Remedial and Mitigation Measures

12.7.1 Construction Phase

The development of the quarry shall be carried out in an organised basis, with no construction, the main impact shall be on an operational basis.

There are existing offices on site, however, no buildings will be constructed during this phase. The quarry shall be serviced from the existing plant. The proposal shall be in keeping with existing quarries in the area. The quarry shall supply raw material for the construction industry.

12.7.2 Operational Phase

The mitigation measures, including measures taken during the design stage, which have evolved throughout the design process, that have been adopted in the proposed scheme and are detailed in the Landscape Plan, are as follows:

- The reintroduction and planting of native hedgerows and trees.
- The augmentation of existing hedgerows with native hedge planting. ▪ The provision of a landscape buffer of 5 – 8 m to surround the subject site where no existing hedgerow is present.

- Native and pollinator species (as per The All Ireland Pollinator Plan 2021-2025) planting for biodiversity may/shall be incorporated into the planting scheme

Operationally the quarry itself shall be screened from view, but noise and the movement of vehicles such as lorries and trucks shall be the main landscape impact. However, as there are two quarries in the area, there is already existing noise and movement of vehicles.

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12.7.3 Waste handling areas

There shall be minimal need for bin storage, waste shall be collected locally, papers, wrapping and bottles, used by general operatives shall be collected locally and individually into a simple bin. The bin shall be placed in an area away from public view and shall be emptied when full.

12.7.4 Do Nothing Impact

Should the development not proceed it is likely that the site would remain in its present state, a field system. The landscape buffer and hedge and tree planting would not occur and the positive

At present the site is a field adjacent to an existing quarry to the east that shall form part of this development and a quarry to the north that is operational. Therefore, the quarrying activity on this site will remain regardless and landscape impact will remain as it is.

12.8.0 Landscape Impact Assessment Criteria

The following criteria are considered, when assessing the potential impacts on the Landscape resulting from a proposed development,

• Landscape/Landscape character, value and sensitivity.

• Magnitude of likely impacts;

• Significance of landscape effects.

The sensitivity of the Landscape to change is the degree to which a particular setting can accommodate changes or new elements without unacceptable detrimental effects to its essential characteristics. Landscape/Landscape Value and Sensitivity is classified using the

following criteria set out in **Table 4**

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Table 4: Landscape/Landscape Value and Sensitivity – Magnitude of Change

Sensitivity	Description
Very High	Areas where the Landscape character exhibits a very low capacity for change in the form of development. Examples of which are high value townscapes, protected at an international or national level (e.g. World Heritage Site), where the principal management objectives are likely to be protection of the existing character.
High	Areas where the Landscape character exhibits a low capacity for change in the form of development. Examples of which are high value townscapes, protected at a national or regional level, where the principal management objectives are likely to be considered conservation of the existing character.
Medium	Areas where the Landscape character exhibits some capacity and scope for development. Examples of which are townscapes, which have a designation of protection at a county level or at non-designated local level where there is evidence of local value and use.
Low	Areas where the Landscape character exhibits a higher capacity for change from development. Typically, this would include lower value, non-designated townscapes that may also have some elements or features of recognisable quality, where management objectives include, enhancement, repair and restoration.
Negligible	Areas of Landscape character that include derelict sites and degradation where there would be a reasonable capacity to embrace change or the capacity to include the development proposals. Management objectives in such areas could be focused on change, creation of Landscape improvements and/or restoration.

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Impact Significance Matrix – See Table 5.

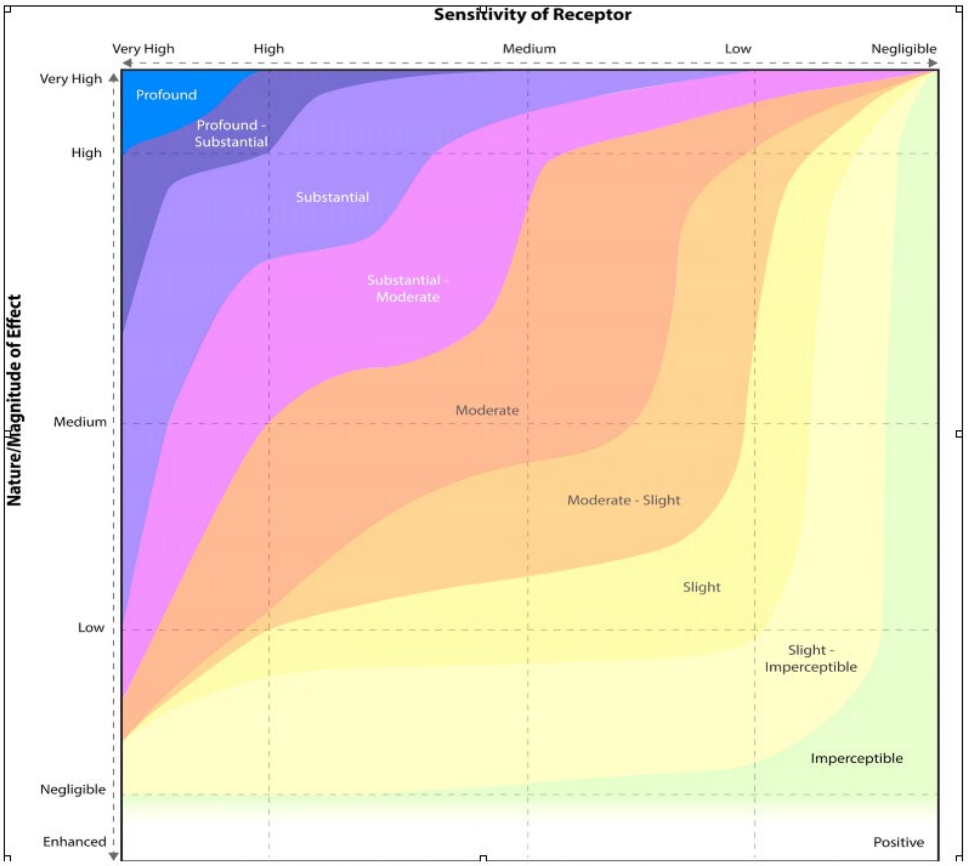

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Table 5: Assessment of Magnitude of Change for Landscape Receptors

Magnitude	Typical Criteria for Landscape Receptors
High	Major removal or addition of landscape features or removal of localised but unusual or distinctive landscape features and/or addition of new conspicuous features and elements which may alter the character of the landscape (with uncharacteristic features being negative and characteristic features being positive). Physical loss of landscape features that are not replaceable or are replaceable only in the long term.
Medium	Moderate removal or addition of landscape features and/or addition of new noticeable features and elements which would be clearly visible but would not alter the overall character of the landscape (with uncharacteristic features being negative and characteristic features being positive). Physical loss of landscape features that are replaceable in the medium term.
Low	Minor removal or addition of landscape features and/or addition of new discrete features and elements which would be perceptible within but would not alter the overall character of the landscape (with uncharacteristic features being negative and characteristic features being positive). Physical loss of landscape features that are readily replaceable in the short term.
Negligible	Barely perceptible removal or addition of landscape features would occur and the development would be barely perceptible in visual/ character terms.

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Fig 10. – Receptor Points

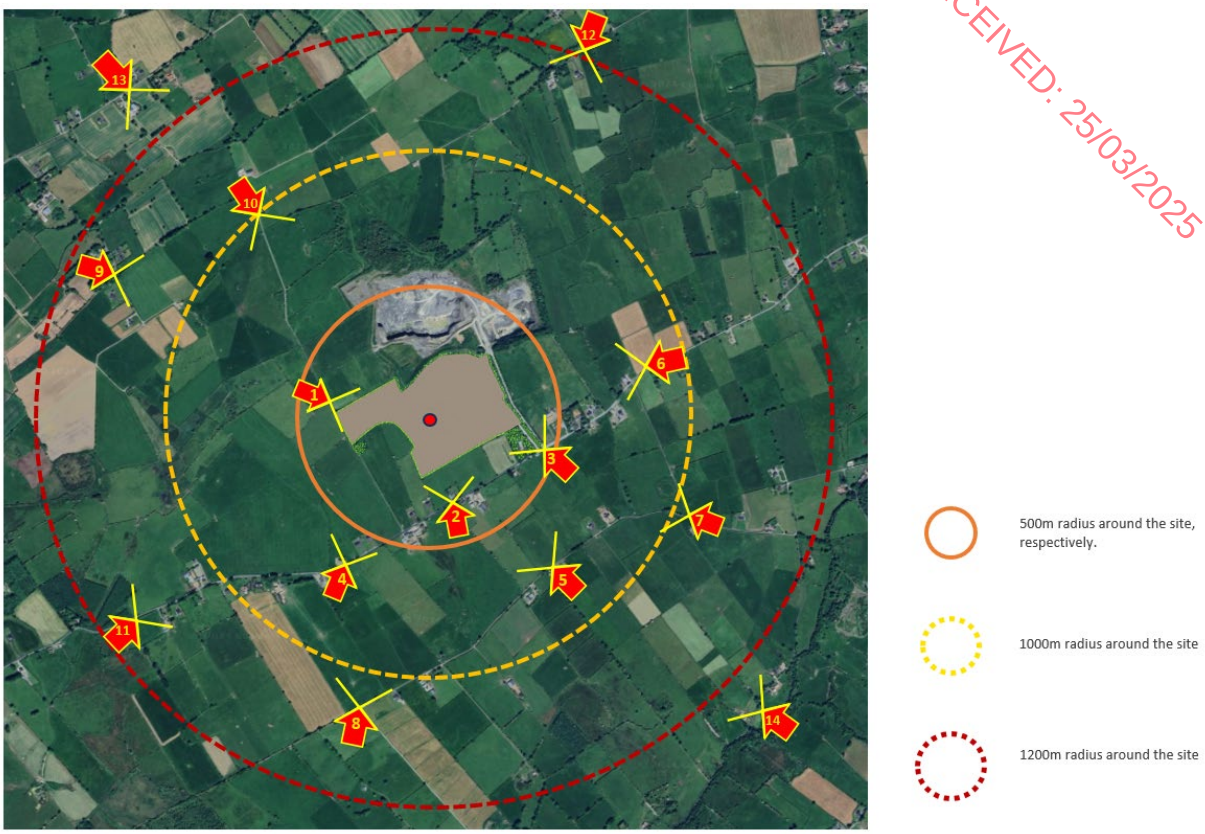
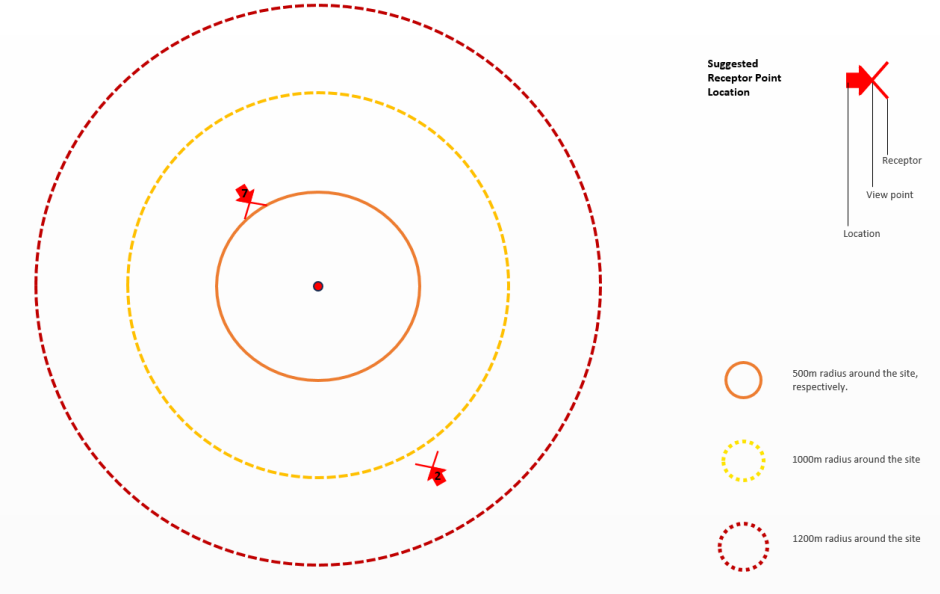


Fig.11. – Receptor View Locations



12.9.0 Visual Selector Interaction

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The 14 no. visual receptors have been assessed and presented to the team. Through a process of dialogue in conjunction with the Collins Boyd,
Consulting Engineers & RMDA Landscape Architects provided locations for the visual receptors. They represent the most significant and sensitive location points. They were based upon the sensitivity of the locations and typical criteria is listed below.

12.9.1 Sensitivity – susceptibility of Receptors.

A visual receptor is a human user of the landscape. The practice has adopted the principle that the sensitivity for each type of visual receptor is inherent to the nature of the activity they are undertaking rather than the view itself.
In accordance with the Institute of Environmental Management and Assessment ("IEMA") Guidelines for Landscape and Visual Assessment (3rd edition 2013) visual receptors most susceptible to changes in views and visual amenity are:

- *"Residents at home.*
- *People, whether residents or visitors, who are engaged in outdoor recreation, including use of public rights of way, whose attention or interest is likely to be focussed on the landscape and on particular views.*
- *Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience.*
- *Communities where views contribute to the landscape setting enjoyed by residents in the area.*
- *Travellers on road rail or other transport routes where such travel involves recognised scenic routes and awareness of views is likely to be heightened".*

Visual receptors that are less susceptible to changes in views and visual amenity include:

- *"People engaged in outdoor sport or recreation, which does not involve or depend upon appreciation of views of the landscape.*
- *People at their place of work whose attention may be focused on their work or activity, not their surroundings and where the setting is not important to the quality of working life".*

12.9.2 Sensitivity

A visual receptor is a human user of the landscape. The practice has adopted the principle that the sensitivity for each type of visual receptor is inherent to the nature of the activity they are undertaking rather than the view itself.

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12.9.3 Images

14 x no images have been prepared surrounding the site to fully illustrate the physical and visual nature of the proposed development.

Table 6: Visual Receptor Sensitivity

Sensitivity	Typical Criteria for Visual Receptors
High	Users of Quarry properties, public rights of way, named viewpoints and scenic roads or railways. Users of cultural heritage features including World Heritage Sites, Registered Parks and Gardens, Scheduled Monuments, Listed Buildings and Conservation Areas where they are known to be tourist destinations or places used by local communities.
Medium	Users of public rights of way (urban or industrial areas) play areas, sporting and outdoor active recreational facilities and rural roads.
Low	Users of office and employment areas, industrial areas and the main road and rail network.

View 1	
Existing View	A little bit above the western corner of the proposed quarry – it would be seen from here, but obscured by the existing hedgerow and shall be further screened by proposed augmentation of the hedge & trees with new planting of native hedgerow & trees.
Proposed View	The planting of whips, Trees and Semi mature trees shall ameliorate the visual impact and with the landscape buffer of trees growth in 3 – 5 years it shall be neutral Landscape impact with a positive long term visual impact.
Impact Significance	Moderate
Quality of Visual Impact	Neutral
Duration of Impact	Short Term – in keeping with existing and local industry
Landscape/Townscape Sensitivity	Medium
Magnitude of Change	Low-Medium
Visual Receptor Sensitivity	Medium - High

View 2	
Existing View	**Parallel to the site on the road leading there, looking north.**
Proposed	The landform is rising gently and is currently screening the existing quarry and shall also screen the quarry extension. The duration of works on the quarry surface shall determine the impact.The landscape impact shall be moderate as part of the land is currently an existing quarry. The growth of trees shall absorb the subject site into the environment, the impact shall be slight to the short – medium term. The visual impact shall be negative in the short term, with intial works and shall be neutral in medium term and positive in long term due to the planting of additional trees and hedges
Impact Significance	Moderate
Quality of Visual Impact	Neutral
Duration of Impact	Short – Medium term
Landscape/Townscape Sensitivity	Medium
Magnitude of Change	Low – Medium
Visual Receptor Sensitivity	Medium - High

View 3	
Existing View	**Between the two entrances of the existing quarry and the one to be expanded, southeast of the site – the area to be seen will remain similar, except for the additional fence along the road to the quarry to be expanded.**
Proposed View	The image shows existing entrance. The Landscape impact shall be dependent on noise and dust from the operation of the quarry. As there are similar operations in the area and a quarry directly adjacent to the proposed quarry extension, the impact shall be slight to moderate. Visually neutral and is screened from view. The visual impact shall be slight, due to additional moving vehicles.
Impact Significance	Moderate
Quality of Visual Impact	Neutral
Duration of Impact	Medium term
Landscape/Townscape Sensitivity	Negligible to Low
Magnitude of Change	Low – Medium
Visual Receptor Sensitivity	Medium – High

View 4	
Existing View	**Next to the Issert Kelly Old Graveyard on the road leading to the northeast to the entrance of the quarry – only the trees around it can be seen.**
Proposed View	The image shows stone walls and the existing field system The subject site is screened from view by existing vegetation and landform. The Landscape impact shall be dependent on noise and dust from the operation of the quarry. However the distance from the quarry it is not seen as an issue therefore the landscape impact due to possible noise and increased traffic shall be imperceptible. There shall be no visual impact and therefore is neutral/positive.
Impact Significance	Imperceptible due to vegetation, landform and walls. Possible slight due to additional traffic from quarry operations
Quality of Visual Impact	Neutral
Duration of Impact	Temporary – Short Term
Landscape/Townscape Sensitivity	Medium
Magnitude of Change	Negligible
Visual Receptor Sensitivity	Medium – High

View 5	
Existing View	**Southeast, opposite the quarry site – only the tree tops of the corridor are visible from this location.**
Proposed	The landform – hill and existing hedgerows and trees shall screen the proposed quarry. The additional growth of proposed trees shall absorb the subject site into the environment, the impact shall be negligible and a positive impact in the medium to long term due to additional planting.
Impact Significance	Imperceptible
Quality of Visual Impact	Neutral – positive.
Duration of Impact	Temporary to Short term, length of time for tree growth, no view of the quarry in this time.
Landscape/Townscape Sensitivities	Medium - High
Magnitude of Change	Negligible to minor
Visual Receptor Sensitivity	Medium

View 6	
Existing View	**East of the quarry, following the road – looking West – Trees, Hedgerows are screening the quarry**
Proposed	The image shows existing field system, with existing walls, agricultural sheds screening the quarry extension. The subject site is also screened from view by existing vegetation. The Landscape visual impact shall be dependent on noise and dust from the operation of the quarry. However the distance from the quarry it is not seen as an issue therefore the landscape impact due to possible noise and increased traffic shall be imperceptible. There shall be no visual impact and therefore is neutral.
Impact Significance	Imperceptible – screened from view Slight – in terms of additional traffic.
Duration of Impact	Brief – no visual view, possible
Quality of Visual Impact	Neutral
Landscape/Townscape Sensitivities	Medium
Magnitude of Change	Negligible
Visual Receptor Sensitivity	Medium

View 7	
Existing View	**Southeast of the quarry, looking northwest– nothing of the site can be seen from here.**
Proposed	The image shows existing field system, with existing vegetation. There shall be no visual or landscape impact from this location and therefore is neutral impact.
Impact Significance	Imperceptible – screened from view by landform & Vegetation.
Quality of Visual Impact	Neutral
Duration of Impact	Momentary
Landscape/Townscape Sensitivities	Medium
Magnitude of Change	Negligible
Visual Receptor Sensitivity	Medium

View 8	
Existing View	**South of the proposed quarry, next to the Isert Kelly Castle – the trees will be visible from this position.**
Proposed	The image shows the existing field system and associated hedgerows, and trees. The subject site is screened from view by existing vegetation. However the distance from the quarry is 1.5Km therefore the landscape impact shall be no impact. There shall be no visual impact and therefore is neutral.
Impact Significance	Imperceptible – screened from view by landform & Vegetation.
Quality of Visual Impact	Neutral
Duration of Impact	Momentary - None
Landscape/Townscape Sensitivities	Medium
Magnitude of Change	Negligible
Visual Receptor Sensitivity	Medium

View 9	
Existing View	**Northwest of the site, right next to a number of houses in a group. None of the quarry may be seen.**
Proposed	The image shows existing stone walls, the existing field system and associated hedgerows, and dense vegetation. The subject site is screened from view by existing vegetation. However, the distance from the quarry is 1.5Km therefore the landscape impact shall be no impact. There shall be no visual impact and therefore is neutral.
Impact Significance	Imperceptible – screened from view by landform & Vegetation.
Quality of Visual Impact	Neutral
Duration of Impacts	Momentary
Landscape/Townscape Sensitivities	Low - Medium
Magnitude of Change	Negligible
Visual Receptor Sensitivity	Medium

View 10	
Existing View	**Part of a private Driveway, looking south East. The existing quarries are difficult to see from this view and therefore the extension would be obscured by vegetation.**
Proposed	The image shows existing stone walls, the existing field system and associated hedgerows, and Trees The subject site is screened from view by existing vegetation. However the distance from the quarry is 812m therefore the landscape impact may possibly be seen. However, the proposed extensive planting and berm will remove any view of quarryu activity in a short term.
Impact Significance	Moderate – in keeping with current land use and activity
Quality of Visual Impact	Neutral
Duration of Impact	Short term
Landscape/Townscape Sensitivities	Low - Medium
Magnitude of Change	Low – Medium
Visual Receptor Sensitivity	Medium

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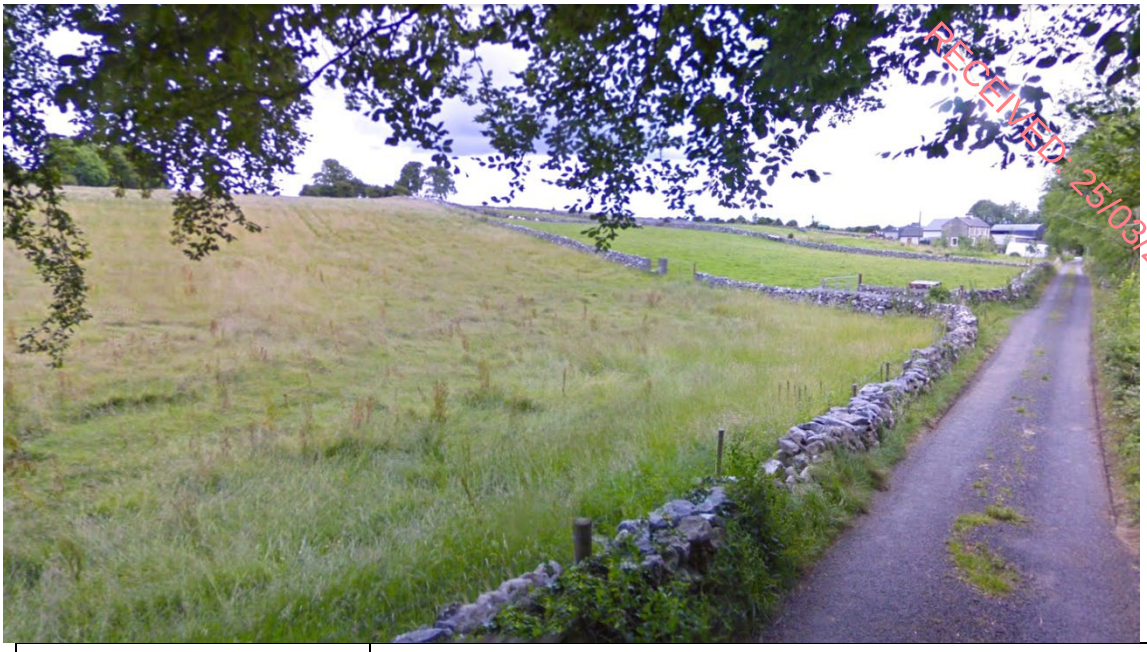
View 11	
Existing View	**Immediately after the forest at Grannagh Beg, following the road, the quarry is directly accessible – nothing may be seen from this location.**
Proposed	The image shows existing field system and associated hedgerows, and Trees. The subject site is screened from view by existing vegetation. However the distance from the quarry is 1.25Km therefore the landscape impact shall be no impact. There shall be no visual impact and therefore is neutral.
Impact Significance	Imperceptible – screened from view by landform & Vegetation.
Quality of Visual Impact	Neutral
Duration of Impact	Momentary
Landscape/Townscape Sensitivities	Medium
Magnitude of Change	Negligible
Visual Receptor Sensitivity	Medium



View 12	
Existing View	**North East of the proposed quarry, beside existing residential and farm buildings – because of the landform – hill and the vegetation nothing will be visible.**
Proposed	The image shows existing stone walls, the existing field system and associated hedgerows, and Trees. The subject site is screened from view Therefore there shall be no visual impact and therefore is neutral.
Impact Significance	Imperceptible – screened from view by landform & Vegetation.
Quality of Visual Impact	Neutral
Duration of Impact	Momentary - None
Landscape/Townscape Sensitivities	Medium
Magnitude of Change	Negligible
Visual Receptor Sensitivity	Medium

View 13	
Existing View	**On the street at Monksfield, looking southeast – the quarry can not be viewed.**
Proposed	The image shows existing stone walls, the existing field system and associated hedgerows, and dense vegetation. The subject site is screened from view by existing vegetation. However the distance from the quarry is 1.5Km therefore the landscape impact shall be no impact. There shall be no visual impact and therefore is neutral.
Impact Significance	Imperceptible – screened from view by landform & Vegetation.
Quality of Visual Impact	Neutral
Duration of Impact	Momentary - None
Landscape/Townscape Sensitivities	Medium
Magnitude of Change	Negligible
Visual Receptor Sensitivity	Medium

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View 14	
Existing View	**Northeast of the site – nothing of the quarry extension may be seen. The image shows existing stone walls, the existing field system and associated hedgerows, and tree. Landform also screens the quarry.**
Proposed	The subject site is screened from view by existing vegetation and landform There shall be no visual impact and therefore is neutral.
Impact Significance	Imperceptible – screened from view by landform & Vegetation.
Quality of Visual Impact	Neutral
Duration of Impact	Momentary - None
Landscape/Townscape Sensitivities	Medium
Magnitude of Change	Negligible
Visual Receptor Sensitivity	Medium

2.0.0 Monitoring

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A Landscape Architect shall be appointed to oversee and monitor the project at construction & operational stage. They shall liaise with other project members in relation to the development of the proposal.

The landscape architect shall overview all hard & soft landscape works and liaise with resident engineer, project team and contractor. The landscape architect shall also inspect the trees; however, most of the monitoring works shall be during and post-civil construction stage. The landscape architect shall review and instruct on details of soft planting, trees and native hedge planting. There shall be a security fence that shall also be constructed to surround the proposal.

During the operational stage, the landscape Architect shall review the state of all planting and trees, The landscape architect shall review for period of 18 months, from practical completion of each stage the standard and quality of the materials and workmanship. A final certificate of completion shall be issued by the landscape architect in respect of this.

2.1.0 Interactions and Cumulative Impacts

Inter-relationships are the interaction /interrelations between the impacts and proposed mitigation for one discipline with another associated discipline.

2.1.1 Material Assets & Land – Property

There are houses just to the south of the proposed quarry, within 300m of the subject site. Although the redevelopment of the site, initially shall be negative, the tree planting and hedgerows grow the visual impact shall be a positive impact. The impact on the surrounding property shall be short term. The existing quarry has established associated land use. The visual impact shall be ameliorated by the existing hedgerows and trees and shall be further enhanced by the proposed landscape buffer.

2.1.2 Biodiversity

There are existing trees and hedgerows on the subject site. There is an opportunity for the proposed planting to introduce pollinator species into the development, with the planting of new hedges and trees and the augmentation of existing trees and hedgerows. This is a positive landscape impact.

Internally a hedgerow shall be removed but the planting of the landscape buffer shall increase the number and range of native trees and plants in the area. This habitat renewal shall provide an environment for wildlife and flora and shall increase the number, length of native hedgerows on the subject site.

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2.1.3 Population & Human Health

The visual impacts will arise for residents located close to the proposed quarry

Any impacts shall be during the operational stage. Specific mitigation measures include the provision of fence around the quarry – to provide protection and a level of screening.

During the Operational phase of the quarry activity, landscape & visual impacts will reduce as the growth of the hedgerow shall screen the quarry. The tree and hedge planting respects the existing landscape boundaries in the local environment and increases the number and range of native plants in the local area.

The impacts of the new buffer planting shall be positive as it reinforces the character of the hedgerows and local field systems. The reintroduction of new habitat areas in the form of hedgerows and trees is a welcome and a positive visual impact.

12.1.4 Difficulties Encountered in Compiling

Kilchreest is an open site with easy access to the site. There were no difficulties encountered on visiting the development area.

12.3.0.0 Conclusion

The visual impact of the development shall be over a period of time, i.e. during the operation of the quarry. The removal of landform and hedge shall be negative at first, due to the removal of the existing hedgerow and the landform in the middle of the site.

However, over time, as the proposed landscape measures mature, it shall present a greater landscape buffer and habitat than is currently in existence. The landscape works in the form of hedgerows and trees shall be a positive visual impact over the long term and with management it shall be remain during the lifetime of the quarry.

The character of the environment in the form of field system shall not change. The proposal is in line with emerging patterns of quarry developments in Kilchreest and it shall provide a valuable resource for

the adjoining and existing quarry. The quarries have been in existence for some time and it is located directly beside the proposed quarry, therefore providing an organised and efficient method of production. There shall be no long truck runs and therefore a reduced impact on the environment and landscape.

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The impacts in the long term will be due to activity such as dust, which may be controlled. The road usage by lorries shall be controlled, as the proposed is an extended one of an existing quarry. it is also adjacent to another quarry operated by Roadstone, therefore no trips are required to deliver material for the quarry. The landscape impact therefore may be controlled in this way.

Therefore, the impact upon the nature of the landscape/Landscape shall be moderate - significant in the short term, with slight impacts in the long term.

12.4.0.0 Non-Technical Summary

The development of the quarry in Kilchreest is in keeping with the character of the area, with a number of similar quarries in the locality.
The proposal combines the coherency of quarry development and respects the character of the adjoining land use in the Kilchreest area.
It is set back from the road and provides extensive screening in the form of native planting.
It shall have a positive impact on the field systems, reintroducing hedgerows and trees that shall bring a renewed habitat to the locality. The addition of this landscape buffer is significant and will increase the biodiversity in the area. This a welcome addition and can shall be planted to operations in the quarry.

The location of the quarry adjacent to an existing quarry of the client and one of adjoining operator – Roadstone means that any impact is in keeping with current land use.

It also reduces truck journeys to a separate location, and the necessity for structures to be constructed to service the quarry.
All the necessary infrastructure is present in the current quarry.

The development shall provide a coherent production and extraction of materials by virtue of the location. It is providing an opportunity to provide a new habitat that shall host a greater range of biodiversity than the current field system.

The quarry shall not detract from the local landscape as the manner of the landscape mitigation shall screen it from public view. It shall extend the lifetime of the existing plant by providing readily available raw material for the production of material for the construction industry.
The quarry shall provide local employment in the extraction process and guarantee the source of material for the construction industry.
The positive social impact from the production of material for housing shall, provide jobs in the construction industry and houses for people for many years to come.

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12.5.0.0 References

• Galway County Development Plan 2022-2028.

• Landscape Character Assessment of County Galway - Roscommon County Development Plan 2022-2028.

• Record of Protected Structures - Galway County Development Plan 2022- 2028.

• Advice Notes on Current Practice in the preparation of Environmental Impact Statements (1995)

• Guidelines on the Information to the Contained in Environmental Impact Statements (2002).

• Revised Guidelines on the information to be contained in Environmental Impact Statements Draft (September 2015)

• Guidelines On the Information To Be Contained In Environmental Impact Assessment Reports Draft (August 2017)

• Landscape Institute and Institute of Environmental Management & Assessment (2013). Guidelines for Landscape and Visual Impact Assessment.

• Planning and Development, Act 2000, as amended.

• EPA EIAR Guidelines (August 2017)

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CHAPTER 14

Traffic Impact Assessment

14 MATERIAL ASSETS - TRAFFIC & TRANSPORT

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14.1 Introduction

This chapter reports the findings of a retrospective assessment on the likely significant effects on traffic and transportation as a result of quarrying / extraction of 120,000 tonnes of material a year from the existing quarry.

Chapter 3 (Description of Development) provides a full description of the Development and describes an overview of operational activities within the site.

14.2 Methodology

This chapter describes the assessment methodology to assess the potential impact the proposed development may have on the surrounding road network. The assessment describes the existing situation at the Site in terms of access while also describing the existing situation and the predicted future situation on the external road network. The methodology adopted for this assessment is summarised as follows:

- Traffic counts were undertaken in October 2024 during a 12-hour period (07:00 – 19:00). Count information was obtained at the existing L8532 / Kilchreest Quarry priority junction.
- Existing Traffic Assessment – A spreadsheet model was created which contains the base year DO-NOTHING traffic count data described above. The traffic count data was used to develop a PICADY model of the existing L8532 / Kilchreest Quarry priority junction.

Future Year Assessment – The estimated future year traffic volumes on the study area road network, as a result of the increase in background traffic and development related traffic was used to assess the future operational performance of the junction at the current year, 5 years after opening and 15 years after opening.

14.2.1 Background

14.2.1.1 Relevant Guidelines, Policy and Legislation

The following guidance documents have been utilised in the assessment of the potential traffic and transport related impacts on the regional and local road network:

- EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports, 2022 [6];
- Traffic and Transport Assessment Guidelines, by Traffic Infrastructure Ireland (formerly the National Roads Authority (NRA)), 2004 [149],
- Transport Infrastructure Ireland Publications (Standards and Technical) documents;
- Guidelines for the Environmental Assessment of Road Traffic, by the Institute of Environmental Management and Assessment, 1994 [150] and.
- County Galway Development Plan 2022-2028 [18].

A summary of the relevant traffic and transport related policy context in relation to the Site is outlined below.

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14.3 Receiving Environment

The existing road network within the vicinity of the application site is illustrated in Figure 14.1 below and is described further below

14.3.1.1 Roads Network

The existing access to the Site is off the L8532 local road. The L8532 travels in an east – west direction providing a link to the R380 and the R458.

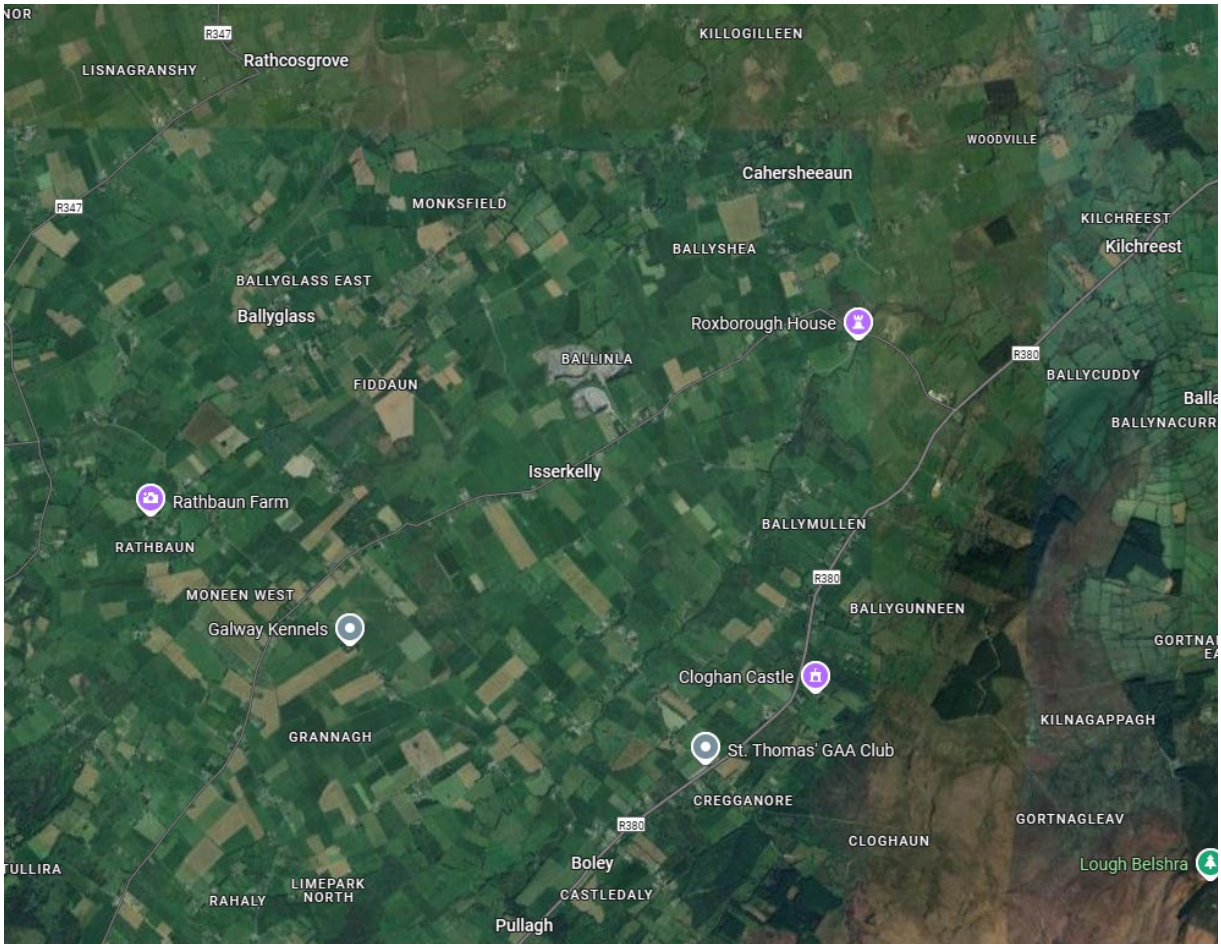

Figure: 14.1 – Site Location

14.3.1.2 Existing Traffic

A traffic count was undertaken by NDC on the 02nd of October 2024 during a 12-hour period (07:00 to 19:00). The count data is provided in Appendix 14.1 – Traffic Counts. Count information was obtained at the following junctions:

- the existing L8532 / Kilchreest Quarry priority junction

The traffic flows during the AM and PM peak hours were abstracted from the surveyed data and are shown in the following tables:

Table 150-2: L8532 / Kilchreest Quarry Priority Junction – 2024 AM Peak Flows

From / To	L8532 (west)	Quarry Access	L8532 (east)	Totals
L8532 (west)	0	4 (3)	22 (1)	**26**
Quarry Access	0	0	4 (2)	**4**
L8532 (east)	18 (1)	2 (2)	0	**20**
Totals	**18**	**6**	**26**	**50**

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Table 150-3: L8532 / Kilchreest Quarry Priority Junction – 2024 PM Peak Flows

From / To	L8532 (west)	Quarry Access	L8532 (east)	Totals
L8532 (west)	0	2 (2)	15 (2)	**17**
Quarry Access	2 (2)	0	3 (2)	**5**
L8532 (east)	24 (3)	2 (2)	0	**26**
Totals	**26**	**4**	**18**	**48**

*No. of HGV's are indicated in the brackets

14.3.1.3 Background Traffic

Transportation Infrastructure Ireland (TII) issues a range of traffic growth factors to be applied to existing traffic flows which are broken down into three groups; low growth, medium growth and high growth. Due to the nature and location of the proposed development it is assumed that medium growth is most likely for the road network surrounding the proposed development.

The zone in which the Site is located is numbered 209 in the TII National Traffic Model. The medium growth factors for each operational phase are as follows:

Table 05-8: Future year Traffic Growth

Zone	2024 Development Operational	2029 Development Operational	2039 Development Operational
209	1.00	+ 9.54%	+ 17.97%

These percentages have been used to predict the increase in background traffic along the road network surrounding the proposed development that will occur in future years. Full summary tables and predicted future traffic flows for 2029 and 2039 future years are included in Appendix 14.2 – Traffic Flow Sheets.

14.3.1.4 Access Arrangements

Access to the Site is via the existing L8532 / Kilchreest Quarry priority junction as indicated on the site layout drawing provided in Appendix A – Planning Drawings. Proposed Site Layout Plan (Sheet 5) Drawing No. 23.129-015

A speed limit of 80km/h applies along the L8532 local road and a speed limit of 30km/h applies along the existing Kilchreest Quarry access road.

14.4 Characteristics and Potential Effects of the Development

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It is proposed to extend the existing quarry which will allow for 120,000 tonnes of material to be extracted from the quarry on a yearly basis. However, it should be noted that the current number of HGV entering and exiting the Site on a daily basis will not change. The extension to the quarry will not result in an increase of HGV traffic.

The number of HGV trips currently entering and exiting the Site during the AM and PM peak hours were abstracted from the traffic count and are shown in the table below:

Table 14-11: Expected AM and PM Peak Flows

	Trips to Development	Trips from Development
AM Peak	5	2
PM Peak	4	4

14.5 Predicted Impact of Proposed Development

A capacity assessment using the computer programme PICADY was carried out for the following junction:

- the existing L8532 / Kilchreest Quarry priority junction

Full details and results of capacity assessments are contained in Appendix 14.3 – PICADY Results. The parameters shown in the tables are defined as follows:

- **Ratio of Flow to Capacity (RFC)** is a factor indicating the flow on a junction arm relative to its capacity. An RFC of 1.0 means the junction has reached its ultimate capacity and an RFC of 0.85 means that the junction has reached its reserve capacity.
- **Avg. Queue** is the average number of vehicles queued over the time period on the junction approach.
- **Queue delay** is the average number of seconds delay to each vehicle in the time period.
- **Total Delay** is the total number of vehicle hours of delay to all vehicles at the junction over the time period.

14.5.1 L8532 / Kilchreest Quarry Priority Junction

The following tables show the predicted RFC values (Ratio of Flow to Capacity), average queue lengths, average vehicle delay and total delays for the L8532 / Kilchreest Quarry priority junction.

Table 05-12: L8532 / Kilchreest Quarry Priority Junction

Year	Period	Approach	Predicted RFC value	Avg Queue (vehicles)	Queue delay (secs./veh.)
2024 Base Flows	AM Peak	L8532 (west)	-	-	-
		Quarry Access	0.00	0	0
		L8532 (east)	0.00	0	6
	PM Peak	L8532 (west)	-	-	-
		Quarry Access	0.01	0	7
		L8532 (east)	0.00	0	6

2029 Development Operational	AM Peak	L8532 (west)	-	-	-
		Quarry Access	0.00	0	0
		L8532 (east)	0.00	0	6
	PM Peak	L8532 (west)	-	-	-
		Quarry Access	0.01	0	7
		L8532 (east)	0.00	0	6
2039 Development Operational	AM Peak	L8532 (west)	-	-	-
		Quarry Access	0.01	0	6
		L8532 (east)	0.00	0	6
	PM Peak	L8532 (west)	-	-	-
		Quarry Access	0.01	0	7
		L8532 (east)	0.00	0	6

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At present the existing L8532 / Kilchreest Quarry priority junction operates within capacity with no queues and minimal delays during the AM and PM peak hour.

In 2029 and 2039 with the Site operational the existing L8532 / Kilchreest Quarry priority junction will continue to operate within capacity with no queues and minimal delays during the AM and PM peak hour.

14.6 Mitigation

HGV traffic can be of particular concern to both local residents and highway users, and the mitigation measures outlined below are designed to alleviate any adverse impacts:

- Kilchreest quarry will adhere to a routing policy to ensure all movements are made via the strategic road network to avoid HGV's passing through residential areas as far as is practical.
- Kilchreest quarry would employ a policy of safety and environmental awareness for all HGV drivers accessing the site.
-

14.7 Cumulative and Indirect Impacts

At present there are no proposed developments that will have a potential to impact on traffic in the area.

14.8 Interactions with Other Environmental Effects

The environmental attributes which Traffic interact with include:

Chapter 5 (Population and Human Health): Climate change and GHG emissions is an important consideration for human health and a pleasant living environment. This is addressed above.

Chapter 9 (Air Quality): Emissions from traffic have a potential to impact on Air Quality in the areas in close proximity to roads. This is addressed in Chapter 9.

Chapter 10 (Climate): Emissions of GHGs from traffic have a potential to impact on the global climate. This is addressed in Chapter 10.

Chapter 11 (Noise and Vibration): Traffic related to the proposed development has the potential to increase noise levels in the local area. This is addressed in Chapter 11.

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14.9 Residual Effects

The flow to capacity – RFC ratios of the junction affected by the Quarry will increase but the junction will remain significantly below capacity. The local roads infrastructure has the capacity to cater for any increased traffic loads and therefore the Quarry will not have a significant impact on this infrastructure.

14.10 Monitoring

All traffic coming to and departing the development will be logged by security at the entrance to the Site. Kilchreest quarry will also continuously monitor the routing policy to ensure all movements are made via the strategic road network to ensure that delays and impact at key junctions are minimised.

14.11 Reinstatement

Not applicable

14.12 Difficulties Encountered

No difficulties were encountered when compiling this chapter.

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CHAPTER 15

INTERACTIONS

SUMMARY

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15.1 Introduction

The proposed development and the measures already in place to mitigate the impacts together with additional measures have been outlined in the preceding chapters of the EIAR. However, for any development with potential for environmental impacts there is always the prospect for interaction amongst the impacts. The results of interactions may exacerbate, reduce or have a neutral effect on the magnitude of the impacts. These have to be systematically examined as part of the EIA process.

The EIAR prepared by Collins Boyd Engineers and Architects on behalf of Isertkelly Ltd is an integrated document rather than a collection of separate reports. The impacts that will arise as a result of interactions between several aspects of the proposed development have been addressed in the main body of each section.

15.1.1 The Interaction of the Foregoing

- The interaction between the various environmental topics has been covered within each of the EIAR Chapters 4-14 where relevant. The interaction between geology and groundwater for example has been examined in Chapter 7.
- The environmental components which might potentially be impacted by a development of this kind and in this location have been identified through the assessment as follows
- Effects on land use and amenity
- Impacts on sensitive receptors locally
- Loss of natural heritage, wildlife habitats and disturbance of flora and fauna.
- Impacts on groundwater, soils and geology.
- Nuisance potential and health impacts due to noise, dust and light emissions.
- Visual impacts on landscape character
- Impacts on material assets, infrastructure and utilities.

A matrix method has been used in which the environmental components are placed on each axis and their interactions summarised, see Table 15.1 below. The purpose of the exercise is to identify interactions. The significance of the interactions is examined in the relevant EIAR chapter. There is a brief overview of the bigger interactions below.

Table 15.1 Impact Interaction

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	Population Human Health 1	Bio Diversity 2	Land Soils Geology 3	Water 4	Air 5	Climate 6	Noise 7	MA 8	Cultural Heritage 9	Land Scape 10	Traffic 11
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											

15.2 Overview

15.2.1 Biodiversity

- Potential interaction associated with the proposed landscape mitigation and restoration proposals are discussed in chapter 5. The impacts from noise and dust deposition on biodiversity are discussed in chapters 8 and 10.

15.2.2 Water

- The potential impacts on water are discussed on biodiversity in chapter 5, soils in chapter 6 and on material assets in chapter 11.

15.2.3 Air Quality

- The interactions of Climate chapter 9, air quality chapter 8 and population and human health are discussed in the relevant chapters of the EIAR.
- The chapter on air quality indicates that the continued implementation of standard industry mitigation measures will leave emission levels well within acceptable limit at any sensitive receptor. The interactions are therefore considered to be acceptable.

15.2.4 Noise and Vibration

- The interaction between noise and population and human health is examined in chapter 10 and biodiversity in chapter 5.
- The assessments presented in chapter 10 indicate that the continued implementation of standard mitigation measures will be sufficient to result in acceptable emission levels in the area.

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15.2.5 Landscape and Visual

- The potential interaction with biodiversity is discussed in chapters 5 and 13. Ultimately the restoration plan will foster new habitats and could at that stage of the development be considered a positive impact.
- The visual impacts from the development will be at the lower end of the scale due to the topography of the area.

15.2.6 Traffic

- The potential interactions with traffic and the population, air quality and noise are examined in chapters 4, 8 and 10.

15.2.7 Population and Human Health

- Human health is considered in the context of the emissions arising. These have all been demonstrated to be within acceptable limits for both existing and proposed quarries.

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