

KYLETALESHA PORTLAOISE, CO. LAOIS

ElAR Volume 2

BM Lynch Construction and Civils Ltd

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1 INTRODUCTION AND METHODOLOGY

1.1 Introduction

This Environmental Impact Assessment Report (EIAR) has been prepared by Synergy Environmental Limited T/A DNV (hereinafter referred to as DNV) on behalf of BM Lynch Construction & Civils Ltd., hereinafter referred to as ‘the Applicant’, who is seeking planning permission for the infilling of soil and recontouring of lands and all associated works at Kyletalesha, Portlaoise, Co. Laois.

This is a live planning application which was granted planning permission by Laois County Council under Planning Reference 23/200, subject to 20 conditions. The notification of the decision to grant permission was appealed to An Coimisiún Pleanála (formerly An Bord Pleanála) in April 2024. As part of An Coimisiún Pleanála’s ongoing assessment of the application, the Commission requested the preparation and submission of an EIAR for the Proposed Development (Case Number: ABP-319585-24). This EIAR is being submitted in response to a request for Further Information from An Coimisiún Pleanála in respect of the live appeal.

A detailed overview of the project is included in Chapter 2 Description of the Development.

This EIAR presents the environmental impact assessment (EIA) process which has been undertaken in accordance with the Planning and Development Regulations 2001 (as amended).

EIA is a process of identifying and evaluating the likely environmental, social and economic effects of a proposed development project, taking into account both adverse and beneficial effects. EIA also involves finding ways and means to reduce adverse effects and enhance beneficial effects. It ensures that planning decisions are made, taking into account the environmental effects and with engagement from stakeholders has been compiled in accordance with all current legislation and best practice guidance.

This chapter describes the methodology by which the EIA was carried out and the EIAR was completed. The methodology used is broadly consistent across all chapters to ensure the EIAR is clear to navigate for the reader.

1.1.1 Quality Assurance and Competency of Experts

Under Article 5(3)(a) of Directive 2014/52/EU it is a requirement that:

“the developer shall ensure that the environmental impact assessment report is prepared by competent experts”

This EIAR has been led and coordinated by DNV. Technical chapters have been prepared by a multi-consultancy team of environmental specialists.

Founded in 2010, Enviroguide is an award-winning, multi-disciplinary environmental consultancy specialising in environmental compliance, ecology, planning, waste management, contaminated land, engineering, and sustainability. Providing end to end environmental consultancy services, Enviroguide consultants hold scientific, engineering, and/or legal qualifications with extensive technical knowledge and extensive practical experience within the environmental consultancy and management sectors. Professional memberships include

the Chartered Institute of Ecology and Environmental Management, the Chartered Institution of Wastes Management (CIWM), the Irish Environmental Law Association, the Institute of Environmental Management and Assessment (IEMA), Engineers Ireland, the Institute of Geologists of Ireland, and the Royal Town Planning Institute.

Enviroguide was acquired by DNV in 2023. DNV is the independent expert in risk management and assurance, operating in more than 100 countries. Through its broad experience and deep expertise DNV advances safety and sustainable performance, sets industry benchmarks, and inspires solutions.

This chapter has been prepared by Michelle Gaffney, Senior EIA consultant with DNV, with over four years' experience in environmental consultancy. Michelle holds a B.A (Hons) in Earth Science from Trinity College and is currently advancing expertise through an MSc in Environmental Sustainability at University College Dublin. Michelle has been involved in the technical input into a range of Environmental Impact Assessment Report Chapters and has been involved in the project management and delivery of a range of chapters for EIARs of a similar scale and nature to the Proposed Development.

This chapter has been reviewed and approved by Catherine Keogan, Technical Director and EIA Lead at DNV. Catherine is an environmental consultant with over 20 years' experience in consultancy, specialising in EIAs for large-scale residential and commercial developments, working closely with a range of developers, planning consultants and architects within the public and private sector.

For each chapter of this EIAR, the author, qualifications, and experience of working on other development projects are detailed. The EIAR Project Team are identified in Table 1-1.

Table 1-1 EIAR Project Team

No.	Chapter	Consultant Name and address	Specialist Area
1	Introduction and Methodology	DNV, 3D Core C, The Plaza, Park West, D12F9T Michelle Gaffney	Multidisciplinary Planning and Environmental Consultants
2	Description of the Proposed Development and Assessment of Alternatives	DNV, 3D Core C, The Plaza, Park West, D12F9T Michelle Gaffney	Multidisciplinary Planning and Environmental Consultants
3	Planning and Development Context	DNV, 3D Core C, The Plaza, Park West, D12F9TN Rachel Redmond	Multidisciplinary Planning and Environmental Consultants
4	Population and Human Health	DNV, 3D Core C, The Plaza, Park West, D12F9TN Rachel Redmond	Multidisciplinary Planning and Environmental Consultants
5	Biodiversity	DNV, 3D Core C, The Plaza, Park West, D12F9TN Beth Simms	Multidisciplinary Planning and Environmental Consultants
6	Land and Soils		

No.	Chapter	Consultant Name and address	Specialist Area
7	Hydrology and Hydrogeology	DNV, 3D Core C, The Plaza, Park West, D12F9TN Nuria Manzananas Gareth Carroll	Multidisciplinary Planning and Environmental Consultants
8	Air Quality	DNV, 3D Core C, The Plaza, Park West, D12F9TN Darragh Grant	Multidisciplinary Planning and Environmental Consultants
9	Climate	DNV, 3D Core C, The Plaza, Park West, D12F9TN Leah Moloney	Multidisciplinary Planning and Environmental Consultants
10	Noise and Vibration	Wave Dynamics, Unit 202, Nesta Business Centre, Old Airport Rd, Santry, Dublin, D09 HP96 Cathal Reck	Acoustic Consultancy Services
11	Landscape and Visual Impact Assessment	DNV, 3D Core C, The Plaza, Park West, D12F9TN Dara Hilliard	Multidisciplinary Planning and Environmental Consultants
12	Archaeology and Cultural Heritage	IAC Archaeology, Unit G1, Network Enterprise Park, Kilcoole, Co. Wicklow, A63 KT32 Johnnie Gallacher	Archaeology and Heritage Consultancy
13	Material Assets – Traffic and Transport	Transport Insights, Suite 30, 21 Baggot Street Lower, Dublin 2, D02 X658 Eoin Munn	Transport Planning Consultancy
14	Material Assets – Waste and Utilities	DNV, 3D Core C, The Plaza, Park West, D12F9TN Mairéad Foran	Multidisciplinary Planning and Environmental Consultants
15	Risk Management	DNV, 3D Core C, The Plaza, Park West, D12F9TN Lakshmi Priya Mohan	Multi-disciplinary environmental, planning and heritage resource management consultancy
16	Interactions	DNV, 3D Core C, The Plaza, Park West, D12F9TN Aisling Jones	Multidisciplinary Planning and Environmental Consultants
17	Mitigation and Monitoring	DNV, 3D Core C, The Plaza, Park West, D12F9TN Darragh Grant	Multidisciplinary Planning and Environmental Consultants

No.	Chapter	Consultant Name and address	Specialist Area
NTS	Non-Technical Summary	Input from all above consultants and compiled by DNV	Multidisciplinary Planning and Environmental Consultants

1.2 Purpose of the EIAR

EIA is a systematic examination of the potential impacts of a Proposed Development on the environment. In assessing the environmental impacts, this EIAR will review the baseline conditions, describe the Proposed Development and identify the potential for likely significant environmental effects during construction and operation.

Where likely significant adverse effects are identified, proposed mitigation measures will be presented to avoid, manage and minimise such effects.

Under Schedule 5 of the Planning and Development Regulations 2001, as amended (the Planning Regulations), an EIAR is required to accompany planning applications for specified projects as part of the EIA process.

The EIAR describes the outcomes of the iterative EIA process. In doing so, it forms the first part of the EIA process that will be completed by the competent authority, which in turn will be required to examine, analyse and evaluate the direct and indirect effects of the development on the various factors listed in Directive 2011/92/EU, as amended by 2014/52/EU (the EIA Directive).

Where likely significant environmental effects are identified that are unacceptable, the EIA process aims to quantify and minimise the effects of the impact that the specified development has on the environment through appropriate mitigation measures and where necessary, subsequent monitoring. This process is illustrated in Figure 1-1.

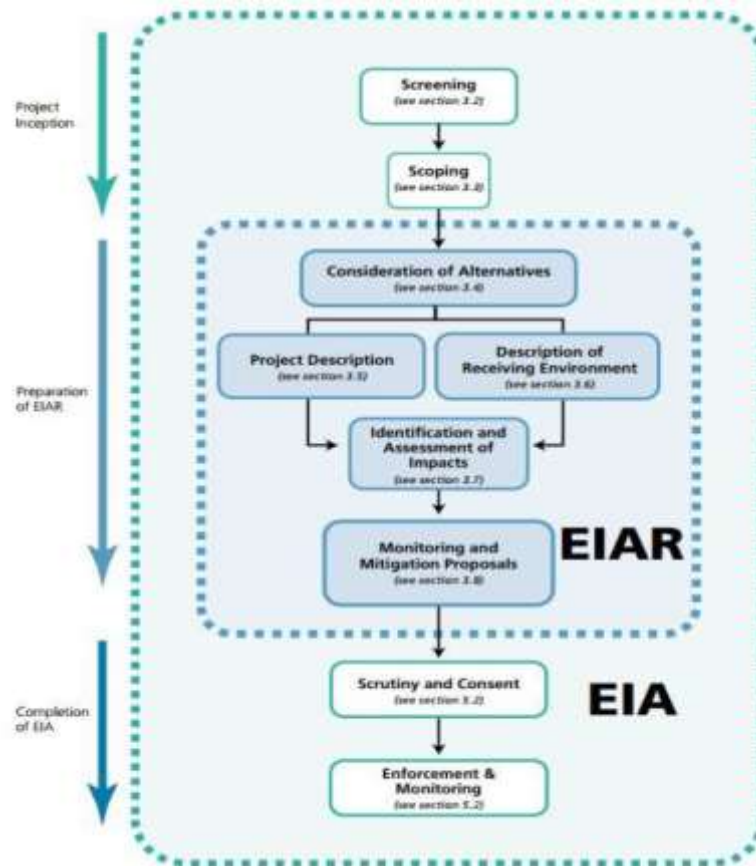


Figure 1-1 EIA Process

The purpose of the EIAR is to provide the relevant competent authority with information on the likely and significant effects on the environment by the Proposed Development. This EIAR reflects the potential cumulative effect of other developments.

1.3 EIA Legislation

The EIA Directive requires EIA to be carried out for certain projects as listed in Annex I of the Directive. The EIA Directive is transposed into Irish law through the Planning and Development Act 2000, as amended, and the Planning and Development Regulations 2001, as amended.

1.4 EIA Guidance Used

This EIAR has been prepared in accordance with all relevant guidance. Topic specific methodology guidance will be set out in the topic chapters. The following general guidance has been used to inform the approach to EIA and present the EIAR chapters.

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA May 2022);
- Environmental Assessments of Plans, Programmes and Projects – Rulings of the Court of Justice of the European Union (European Union 2017);
- Environmental Impact Assessment of Projects – Guidance on Scoping (Directive 2011/92/EU as amended by 2014/52/EU) (European Union 2017);

- Guidance of Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Union 2013);
- Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report (European Union 2017);
- European Commission 2017. Environmental Impact Assessment of Projects Guidance on Screening (Directive 2011/92/EU as amended by 2014/52/EU);
- EU Commission Guidance on Interpretation of definitions of project categories of annex I and II of the EIA Directive (2015);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Government of Ireland 2018);
- Key Issues Consultation Paper on the Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems; (Department of Housing, Planning, Community and Local Government 2017);
- Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions (European Communities 1999);
- Circular PL 05/2018 -Transposition into Planning Law of Directive 2014/52/EU amending Directive 2011/92/EU on the effects of certain public and private projects on the environment (the EIA Directive), and Revised Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government 2018);
- Implementation of Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (European Communities 2003); and
- Office of the Planning Regulator (OPR) Environmental Impact Assessment Screening Practice Note (2021).

The EIA Directive defines EIA as a process whereby Article 1(2)(g) states that EIA means:

“(i) the preparation of an environmental impact assessment report by the developer, as referred to in Article 5(1) and (2);

(ii) the carrying out of consultations as referred to in Article 6 and, where relevant, Article 7;

(iii) the examination by the competent authority of the information presented in the environmental impact assessment report and any supplementary information provided, where necessary, by the developer in accordance with Article 5(3), and any relevant information received through the consultations under Articles 6 and 7;

(iv) the reasoned conclusion by the competent authority on the significant effects of the project on the environment, taking into account the results of the examination referred to in point (iii);

(iii) and, where appropriate, its own supplementary examination; and

(v) the integration of the competent authority's reasoned conclusion into any of the decisions referred to in Article 8a”.

The EIA Directive requires the EIAR to identify, describe and assess, in an appropriate manner and in light of each individual case, the direct, indirect and cumulative significant effects of the Proposed Development on factors of the environment including:

- a) population and human health
- b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC (respectively, the Habitats Directive and the Birds Directive)
- c) land, soil, water, air and climate
- d) material assets, cultural heritage and the landscape
- e) the interaction between the factors referred to in points (a) to (d)

1.5 The Need for an EIA

Annex 1 of the EIA Directive requires as mandatory an EIA for all development projects listed therein. Schedule 5 Part 1, of the Planning Regulations transposes Annex 1 of the EIA Directive directly into Irish planning legislation. An EIAR is required to accompany a planning application for development of a class set out in Schedule 5, Part 1 of the Planning Regulations which exceeds a limit, quantity or threshold set for that class of development. The Proposed Development is not considered to fall under any class set out in Schedule 5, Part 1 of the Planning Regulations and therefore is not subject to mandatory EIA under this section.

Schedule 5, Part 2 of the Planning and Development Regulations 2001 (as amended) sets national thresholds for projects derived from Annex II of the EIA Directive. In transposing Annex II of the EIA Directive into Irish legislation, Schedule 5 (Part 2) of the Planning and Development Regulations 2001 (as amended) establishes mandatory thresholds for each project class.

Following the 2011 amendment to the Regulations (S.I. No. 464/2011), Class 1(c) was substituted and specifies that an EIA is required for:

“Development consisting of the carrying out of drainage and/or reclamation of wetlands where more than 2 hectares of wetlands would be affected.”

For the purposes of these Regulations, “wetlands” are defined in Article 5(1) as *“natural or artificial areas where biogeochemical functions depend notably on constant or periodic shallow inundation or saturation by fresh, brackish, or saline water.”*

The Proposed Development involves the reclamation of 2.92 hectares of wetlands, exceeding the more-than-2-hectare mandatory EIA threshold under Schedule 5, Part 2, Class 1(c) of the Regulations. Therefore, an EIAR is required to accompany the application.

1.6 Scope of the EIAR

‘Scoping’ is a process of deciding what information should be contained in an EIAR and what methods should be used to gather and assess that information. It is defined in EC Guidance on EIA Scoping 2001 as:

“Determining the content and extent of the matters which should be covered in the environmental information to be submitted in the EIAR”.

The content of this EIAR was informed by a scoping process carried out by the Applicant, design team and EIAR consultants to identify the core issues likely to be most important during the EIA process.

The scope of this EIAR has had regard to the documents listed in Section 1.5 together with:

- The requirements of Part X of the Planning Act and Part 10 of the Planning Regulations.
- The requirements of the Laois County Council Development Plan 2021-2027.
- Relevant Regional and National Planning Policy Documents.
- The receiving environment and any vulnerable or sensitive local features and current uses.
- Previous relevant planning history and applications that have been submitted on the subject and adjoining lands.
- The likely and significant impacts of the Proposed Development on the environment; and
- Available mitigation measures for reducing or eliminating any potentially significant undesirable impacts.

In addition, the individual chapters of this EIAR should be referred to for further information on the documents consulted by each individual specialist consultant.

The EIAR prepared for the Proposed Development has endeavoured to be as thorough as possible and therefore all the issues listed in Schedule 6, Sections 1 and 2 of the Planning and Development Regulations have been addressed in the EIAR.

1.7 Purpose and Objective of the EIAR

The purpose of this EIAR is to assist in the EIA process, by identifying likely significant environmental impacts resulting from the Proposed Development, to describe the means and extent by which they can be reduced or mitigated, to interpret and communicate information about the likely impacts and to provide an input into the decision making and planning process.

The fundamental principles to be followed when preparing an EIAR are:

- Anticipating, avoiding and reducing significant effects.
- Assessing and pursuing preventative action.
- Maintaining objectivity.
- Ensuring clarity and quality.
- Providing relevant information to decision makers; and
- Facilitating public and stakeholder consultation.

EIA is an iterative process. The EIAR captures this assessment process and describes its outcomes. The EIAR documents the consideration of environmental effects and provides transparent, objective and replicable documentary evidence of the EIA evaluation and decision-making processes. The EIAR provides information on any identified effects arising as a consequence of the Proposed Development and which:

- Are environmentally based.
- Are likely to occur; and
- Have significant and adverse effects on the environment.

The EIAR also documents how the design of the Proposed Development incorporates measures for the purposes of impact avoidance, reduction or amelioration; as well as to explain how significant adverse effects will be avoided.

The key objective of this EIAR is to inform the relevant competent authority on the acceptability of the Proposed Development, in carrying out an EIA, in order to reach a decision in the full knowledge of the Proposed Development's likely significant impacts on the environment, if any.

1.8 Format and Structure of the EIAR

The formation of an EIAR necessitates the co-ordination and collation of associated, yet diverse specialised areas of assessment. The EIA approach involves the examination of each environmental factor, describing the existing baseline environment, the Proposed Development, its likely impacts and direct and indirect significant effects pertaining to that environmental factor and mitigation measures, where appropriate.

Each technical assessment sets out the relevant legislation, policy, and guidance together with the methodology used to carry out the assessment of potential effects, including the criteria that are used to establish which effects are significant. The significance criteria follow that as defined in the EPA 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' 2022¹ as shown in *Table 1-2* below.

Table 1-2 Description of Effects

Category	Type and Description
Quality of Effects It is important to inform the non-specialist reader whether an effect is positive, negative or neutral.	Positive Effects A change which improves the quality of the environment (for example, by increasing species diversity, or improving the reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).

¹ https://www.epa.ie/publications/monitoring--assessment/assessment/EIAR_Guidelines_2022_Web.pdf

Category	Type and Description
	Neutral Effects No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative/Adverse Effects A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem, or damaging health or property or by causing nuisance)
Describing the Significance of Effects 'Significance' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful (<i>also see Determining Significance</i>).	Imperceptible An effect capable of measurement but without significant consequences.
	Not Significant An effect which causes noticeable changes in the character of the environment but without significant consequences.
	Slight Effects An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate Effects An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
	Significant Effects

Category	Type and Description
	An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.
	Very Significant An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment.
	Profound Effects An effect which obliterates sensitive characteristics.
Describing the Extent and Context of Effects Context can affect the perception of significance. It is important to establish if the effect is unique or, perhaps, commonly or increasingly experienced.	Extent Describe the size of the area, the number of sites and the proportion of a population affected by an effect.
	Context Describe whether the extent, duration or frequency will conform or contrast with established (baseline) conditions.
	Likely Effects The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
	Unlikely Effects The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Describing the Probability of Effects Descriptions of effects should establish how likely it is that the predicted effects will occur so that the CA can take a view of the	Likely Effects The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
	Unlikely Effects

Category	Type and Description
balance of risk over advantage when making a decision.	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Describing the Duration and Frequency of Effects <i>'Duration'</i> is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful.	Momentary Effects Effects lasting from seconds to minutes.
	Brief Effects Effects lasting less than a day.
	Temporary Effects Effects lasting less than a year.
	Short-term Effects Effects lasting one to seven years.
	Medium-term Effects Effects lasting seven to fifteen years.
	Long-term Effects Effects lasting fifteen to sixty years.
	Permanent Effects Effects lasting over sixty years.
	Reversible Effects Effects that can be undone, for example through remediation or restoration.
	Frequency of Effects Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).
Describing the Types of Effects	Indirect Effects (a.k.a. Secondary or Off-site Effects) Effects on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
	Cumulative Effects The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects.

Category	Type and Description
	'Do-nothing Effects' The environment as it would be in the future should the subject project not be carried out.
	'Worst-case' Effects The effects arising from a project in the case where mitigation measures substantially fail.
	Indeterminable Effects When the full consequences of a change in the environment cannot be described.
	Irreversible Effects When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
	Residual Effects The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic Effects Where the resultant effect is of greater significance than the sum of its constituents (e.g. combination of SOx and NOx to produce smog)

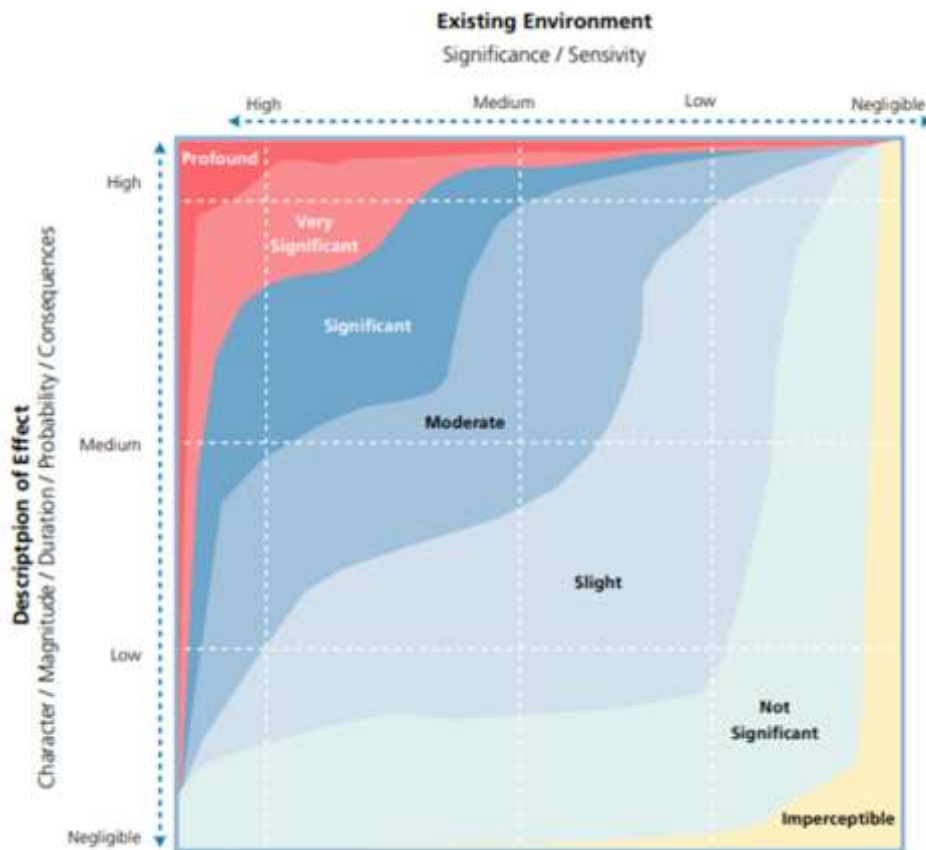


Figure 1-2 :Determining the Significance of the Effect (EPA 2022)

The topics examined in this EIAR are categorised under the environmental factors prescribed under the EIA Directive:

- Population and Human Health.
- Biodiversity.
- Land and Soils.
- Water.
- Air Quality.
- Climate
- Material Assets.
- Cultural Heritage; and
- Landscape and Visual.

The potential likely significant effects caused by the vulnerability of the Proposed Development to risks of major accidents and/or disasters must also be examined.

The structure of the EIAR is set out in *Table 1-3* below.

Table 1-3 Structure of the Environmental Impact Assessment Report (EIAR)

No.	Chapter	Content
1	Introduction	Chapter 1 sets out the introduction, the site description, the general methodology and approach to the EIAR.
2	Description of the Proposed Development & Assessment of Alternatives	As required under Article 5(1)(a) of the EIA Directive, Chapters 2 provides a description of the site, design, and scale of Proposed Development, and as required under Article 5(d), an evaluation of the reasonable alternative design approaches.
3	Planning and Development Context	Chapter 3 sets the national, regional and local policy framework for the Proposed Development.
4	Population and Human Health	Chapter 4 covers the requirement for assessment on potentially significant effects to population and human health as required under Article 3(1)(a) of the EIA Directive.
5	Biodiversity	Chapter 5 covers the requirement of Article 3(1)(b) to assess potentially significant effects on biodiversity (which previously referred only to 'fauna and flora'), having particular attention to species and habitats protected under the Habitats Directive and the Birds Directive.
6	Land and Soils	Chapter 6 covers the requirement under Article 3(1)(c) of the EIA Directive on Land and Soil to assess the type of soil and geology in the area of the Proposed Development and identifies any potentially significant effects.
7	Hydrology and Hydrogeology	Chapter 7 covers the requirement under Article 3(1)(c) of the EIA Directive to assess potentially significant effects to water quality arising from the Proposed Development. This chapter will assess any potential effects from pollution and discharges to surface water.
8	Air Quality	Chapter 8 covers the requirement under Article 3(1)(c) of the EIA Directive on Air to assess potentially significant effects to air quality in the surrounding environment.

No.	Chapter	Content
9	Climate	Chapter 9 covers the requirement under Article 3(1)(c) of the EIA Directive to assess potentially significant effects on Climate Change (greenhouse gas emissions and its vulnerability to climate change).
10	Noise and Vibration	Chapter 10 covers the requirement to assess potentially significant effects from airborne noise and vibration as required under Article 3(1)(a) of the EIA Directive on Human Health.
11	Landscape and Visual Impact Assessment	Chapter 11 covers the requirement under Article 3(1)(d) of the EIA Directive to assess potentially significant effects on the landscape. This chapter will assess any potential visual impacts to landscape caused by the Proposed Development.
12	Archaeology and Cultural Heritage	Chapter 12 covers the requirement under Article 3(1)(d) of the EIA Directive to assess potentially significant effects on cultural heritage.
13	Material Assets – Traffic and Transport	Chapter 13 sets out traffic and transport effects that will be caused on nearby receptors due from increase vehicle movements during the construction phase and operational phase.
14	Material Assets – Waste and Utilities	Chapter 14 covers the requirement under Article 3(1)(d) of the EIA Directive to assess potentially significant effects on material assets. This chapter will identify impacts to existing utilities and infrastructure from the development of the Proposed Development. Article 5(1), Annex IV, point 1(d) requires estimates of quantities and types of waste produced during construction and operation phase. Chapter 12 will also present an assessment of how resources and waste will be managed for the Proposed Development
15	Risk Management	Chapter 15 covers the requirement under Article 3(2) of the EIA Directive, to include the expected effects deriving from the vulnerability of the Proposed Development to risks of major accidents and/or disasters.

No.	Chapter	Content
16	Interactions	As required under Article 3(1)(e) of the EIA Directive, Chapter 16 provides an assessment of the interaction between all of the environmental aspects referred to in this EIAR.
17	Summary of Mitigation and Monitoring Measures	Chapter 17 describes mitigation and monitoring as required under Article 5(1) of the EIA Directive in order to avoid, prevent, reduce, or if possible, offset any identified significant adverse effects on the environment and, where appropriate, describes any proposed monitoring arrangements.

This approach employs standard descriptive methods, replicable prediction techniques and standardised impact descriptions to provide an appropriate evaluation of each environmental topic under consideration.

1.9 Methodology Used to Produce this EIAR

The methodology employed to produce this EIAR is detailed in *Table 1-4* below. The objective is to evaluate each environmental topic, both individually and collectively, in a systematic and objective manner.

The methodology will outline the methods used to describe the baseline environmental conditions as well as predict the likely impacts on the environment of the Proposed Development. The data and survey requirements for each chapter will vary depending on the environmental topic and will be chosen by the particular specialist based on relevant legislation, best practice guidance, policy requirements, and professional judgement. Similarly, the study area is also defined for each environmental topic based on professional judgement and experience.

All environmental topics require desktop reviews of all relevant data at a minimum. These desktop studies are then supplemented by field studies and consultations with relevant stakeholders, for example interested parties, statutory bodies and local authorities, as required for each environmental topic.

Table 1-4 EIA Chapter Approach

Chapter	Description of Section
Introduction	Provides an overview of the specialist area and specifies the specialist who prepared the assessment.

Chapter	Description of Section
Study Methodology	This subsection outlines the method by which the relevant impact assessment has been conducted within that chapter.
The Existing Receiving Environment (Baseline Situation)	This section will describe and assess the receiving environment, the context, character, significance and sensitivity of the baseline receiving environment into which the Proposed Development will fit. This analysis also takes account of any other proposed developments that are likely to proceed in the immediate surroundings.
Characteristics of the Proposed Development	Consideration of the '<i>Characteristics of the Proposed Development</i>' allows for a projection of the '<i>level of impact</i>' on any particular aspect of the environment that could arise. For each chapter those characteristics of the Proposed Development which are relevant to the area of study are described; for example, the chapter on landscape and visual impact addresses issues such as height, design and impact on the surrounding landscape.
Potential Impact of the Proposed Development	This section provides a description of the specific, direct and indirect, effects that the Proposed Development may have. This analysis is provided with reference to both the Existing Receiving Environment and Characteristics of the Proposed Development sections, while also referring to the: (i) magnitude and intensity, (ii) integrity, (iii) duration and (iv) probability of impacts. The assessment addresses whether the impacts are direct, indirect, secondary or cumulative in nature. It also looks at the timescale of such impacts e.g. are they short, medium, long-term, and are they of a temporary, permanent, continuous or intermittent nature, and are they positive or negative impacts. The impact interactions are also addressed.
Avoidance, Remedial and Mitigation Measures	This section of each chapter describes the mitigation measures which are required. The requirement to describe mitigation measures is laid out in the EIA Directive, as implemented by the Planning Act and the Planning Regulations. Avoidance, remedial and mitigation measures describe any corrective or mitigative measures that are either practicable or reasonable, having regard to the potential impacts of the Proposed Development. This includes avoidance, reduction and remedy measures as set out in Section 4.7 of the Development Management Guidelines 2007, to reduce or eliminate any significant adverse impacts identified.

Chapter	Description of Section
Residual Impacts of the Proposed Development	This section allows for a qualitative description of the resultant specific direct, indirect, secondary, cumulative, short, medium and long-term, temporary, permanent, continuous, or intermittent, positive and negative effects as well as impact interactions which the Proposed Development may have, assuming all mitigation measures are fully and successfully applied.
Do Nothing Impact	In order to provide a qualitative and equitable assessment of the Proposed Development, this section considers the Proposed Development in the context of the likely impacts upon the receiving environment should the Proposed Development not take place.
Monitoring	This involves a description of monitoring in a post-development phase, if required. This section addresses the effects that require monitoring, along with the methods and the agencies that are responsible for such monitoring.
Reinstatement	While not applicable to every aspect of the environment considered within the EIAR, certain measures may need to be proposed to ensure that in the event of the proposal being discontinued, there will be minimal impact to the environment.
Interactions	This section provides a description of impact interactions together with potential indirect, secondary and cumulative impacts.
Difficulties Encountered in Compiling Information	The EIA Directive requires that the EIAR includes ' <i>details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information, and the main uncertainties involved</i> ' (EIA Directive, Annex IV, Part 6). Each chapter that contains an environmental baseline and assessment contains a section outlining any difficulties encountered in compiling that chapter.

1.10 Non-Technical Summary

A Non-Technical Summary of the EIAR has also been prepared. The EIA Directive states that one of the objectives of the EIA process is to ensure that the public are fully aware of the environmental implications of any decisions. EPA Guidelines note that the non-technical summary of the EIAR should facilitate the dissemination of the information contained in the EIAR and that the core objective is to ensure that the public is made as fully aware as possible of the likely environmental impacts of projects prior to a decision being made by the competent authority. A Non-Technical Summary of the EIAR has therefore been prepared which summarises the key environmental impacts and is provided as a separately bound document.

1.11 Links between EIAR and Appropriate Assessment

A Screening Report for Appropriate Assessment (AA) has been carried out for the Proposed Development (Roger Goodwillie & Associates, 2023), to determine if there is a risk of effects to any Natura 2000 sites. As the AA screening screened out potential impacts on any Natura 2000 sites, a full Natura Impact Statement (**NIS**) was not required.

While AA is required by the proposer of any plan or project likely to have an adverse effect on a Natura 2000 site, EIA is required for projects listed in Annex I of the EIA Directive. The requirement for EIA relative to projects listed in Annex II of the EIA Directive is determined on a case by case. While these two different types of assessment are independent and are required by separate legislation, namely the Birds and Habitat Directives (i.e. AA) and the EIA Directive (i.e. EIAR) there is a degree of overlap, particularly in the biodiversity chapter of the EIAR.

1.12 Availability of EIAR Documents

As this EIAR is submitted as Further Information to An Coimisiún Pleanála for a live appeal, its availability will be determined by the Commission. Please refer to Laois County Council Planning Reference 23/200 and An Coimisiún Pleanála Case Number: ABP-319585-24, for further information.

1.13 Statement of Difficulties Encountered

No exceptional difficulties were experienced in compiling the necessary information for the Proposed Development. Where any specific difficulties were encountered these are outlined in the relevant chapter of the EIAR.

1.14 Quotations

The application is also accompanied by a Non-Technical Summary of the EIAR, which is laid out in a similar, but condensed format to the main EIAR. The structure, presentation and the Non-Technical Summary of the EIAR, as well as the arrangements for public access, all facilitate the dissemination of the information contained in the EIAR. The core objective is to ensure that the public and local community are aware of the likely environmental impacts of the Proposed Development prior to the granting of consent.

However, it is important to acknowledge that the EIAR by its nature contains statements about the Proposed Development, some of which are positive and some less than positive. Selective quotation or quotations out of context can give a misleading impression of the findings of the study.

The EIA Regulations require that difficulties such as technical deficiencies, lack of information or knowledge encountered in compiling any specified information for the EIAR be described.

2 DESCRIPTION OF THE DEVELOPMENT

2.1 Introduction

This chapter provides a description of the Proposed Development together with the details of the existing environment. In accordance with Article 5(1)(a) of the EIA Directive, the description of the project should comprise:

‘...information on the site, design, size and other relevant features of the project’.

The EIAR must contain information in relation to the environmental impact of both the Proposed Development and all other reasonable alternatives studied. An indication of the main reasons for the option chosen must be given, taking into account the effects of the Proposed Development on the environment.

2.1.1 Quality Assurance and Competency of Experts

This chapter has been prepared by Michelle Gaffney Senior EIA consultant with DNV, with over four years' experience in environmental consultancy. Michelle holds a B.A (Hons) in Earth Science from Trinity College and is currently advancing expertise through an MSc in Environmental Sustainability at University College Dublin. Michelle has been involved in the technical input into a range of Environmental Impact Assessment Report Chapters and has been involved in the project management and delivery of a range of EIARs of a similar scale and nature to the Proposed Development.

This chapter was reviewed by Gráinne Ryan, Principal EIA Consultant at DNV. Gráinne is a Principal Environmental Consultant with 12 years' experience, specialising in EIAs for strategic infrastructure, renewable energy, residential, industrial and pharmaceutical projects. Gráinne has a B.A. in Geography, Planning and Environmental Policy, an MSc in Environmental Policy and a Post Graduate Diploma in Project Management.

This chapter has been approved by Catherine Keogan, Technical Director and EIA Lead at DNV. Catherine is an environmental consultant with 37 years' experience in consultancy, specialising in EIAs for large-scale residential, commercial developments, pharmaceutical, BESS and solar projects working closely with a range of developers, planning consultants and architects within the public and private sector. Catherine has a B.Sc. (Hons) in Analytical Science and a Post Graduate Diploma in Renewable Energy Technology Systems.

2.2 Site Location and Description

The Proposed Development site as shown in Figure 2-1, comprises an elongated land parcel with a total area of 2.92 hectares, located at Kyletalesha, Portlaoise, County Laois, within the eastern extent of the Clonreher Bog peatland. The site lies approximately 2.57 kilometres north of Portlaoise town centre and is located between Portlaoise to the south-east and Mountmellick to the north-west.

Access to the Proposed Development site is gained from the south-east entrance via an existing local gravel access lane leading from the L2117 Local Primary Road. This access forms part of an established private entrance, which is shared with adjoining third-party lands

located to the north. The L2117 joins with the National Secondary Route, the N80, at a controlled junction located approximately 900m south west of the site.

The lands comprising the Proposed Development site consist of Cutover bog. Although the precise historical land-use is not documented, it is considered likely that limited, non-commercial peat extraction took place on the lands in the past.

The ground is wet in nature and is characterised by an overgrowth of self-seeded trees and ground vegetation that has established over time following the cessation of peat-related activity. The existing ground conditions currently render the lands unsuitable for agricultural use and pose risks to both farm machinery and livestock. In relation to topography, the ground levels are below the L2117 Local Primary Road level and decline gradually in a westerly direction, with a number of field drains present throughout the site.

The lands immediately adjoining the Proposed Development site to the north and west, consist of a combination of uncultivated land and areas of existing industrial activity. Lands directly to the west of the Proposed Development site comprise agricultural lands associated with established dairy and beef farming enterprises.

Approximately 750 metres southwest of the Proposed Development site is the former Portlaoise Landfill facility, which now functions as a recycling centre. A number of industrial and waste-related facilities are located approximately 400 metres west of the Proposed Development, each operating under existing waste licences and include:

- AES Recycling Centre Portlaoise;
- Charlie Lawless & Sons;
- Jonathan Ward Ltd Bulk Waste Transport;
- John Styles & Sons and;
- Portlaoise Waste & Recycling Facility.

The wider area has an established history of waste-related activities. In contrast, the Proposed Development involves the recovery and beneficial reuse of a by-product generated from the construction sector. Upon completion, the recontoured landform is expected to provide an improvement on the current land condition.

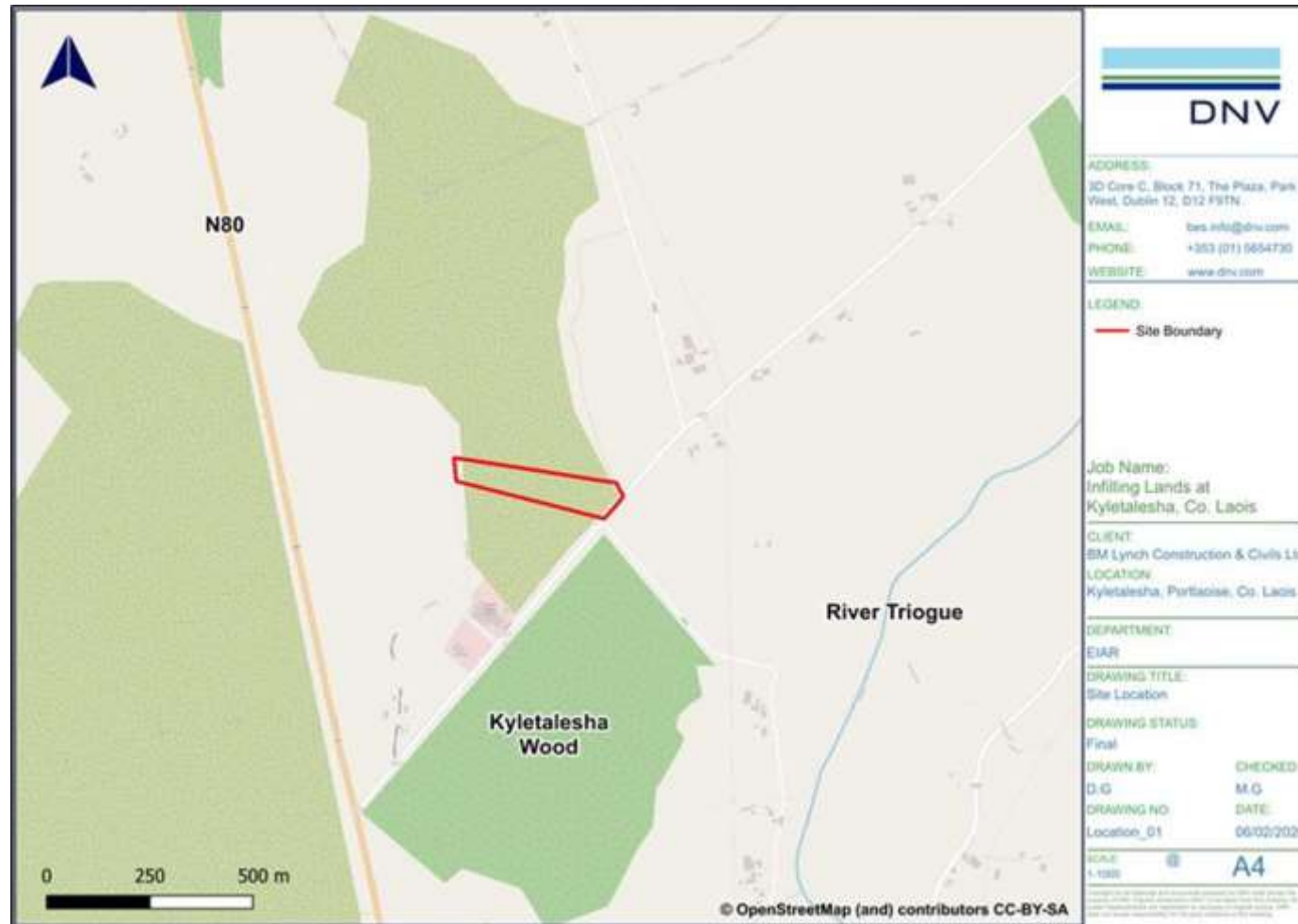


Figure 2-1 Site Location

2.3 Site Background and Site history

The Proposed Development site forms part of the wider Clonreher Bog area, which historically operated as peatland. Following the cessation of peat-related activity, the lands regenerated naturally and have remained unused for productive agricultural purposes due to wet ground conditions. Surrounding lands comprise a mix of agricultural holdings, uncultivated areas, and established industrial and waste-related operations, reflecting a long-standing pattern of mixed rural and industrial land use in this locality.

In accordance with the Laois County Development Plan 2021–2027, the Proposed Development site is located within an “Area under Strong Urban Influence” and lies approximately 2.5 kilometres from both existing and proposed residential zoned lands.

The wider area has an extensive history of waste-related activity, including the former Portlaoise Landfill and a number of licensed waste and industrial facilities located within proximity to the Proposed Development site. However, there is no record of previous development or landfilling activity on the Proposed Development site itself.

The Proposed Development arises from current construction activities in the Portlaoise area, with suitable inert material to be sourced as a by-product under Regulation 27 of the European Communities (Waste Directive) Regulations 2011. The planning history relevant to the surrounding area and landholding is summarised in Chapter 3 of this EIAR.

2.4 Description of the Proposed Development

The Proposed Development comprises the importation of material to in-fill and re-contour the site, which represents the operational stage of the Proposed Development. It comprises the importation of excavated inert soil and stone arising from local greenfield residential development sites in Portlaoise. The applicant proposes, subject to the grant of permission, to import inert soil and stone (by-product) to remediate approximately 2.52 hectares of the total site. On completion, the lands will be recontoured to a maximum finished height of 2.6 metres with an average infill depth of 1.9 metres. All finished ground levels will remain below the adjoining Local Primary Road L2117. The infilling of soil and regrading of land will support future agricultural activity, potential forestry, amenity use, or other appropriate land uses within these low-lying lands, which represents the intended end use of the Proposed Development.

Figure 2-2 illustrates the proposed site location plan, and Figure 2-3 provides a detailed representation of the proposed site layout. These figures are included in Volume 3 Appendix 2-1 and Appendix 2-2, respectively, for further reference.

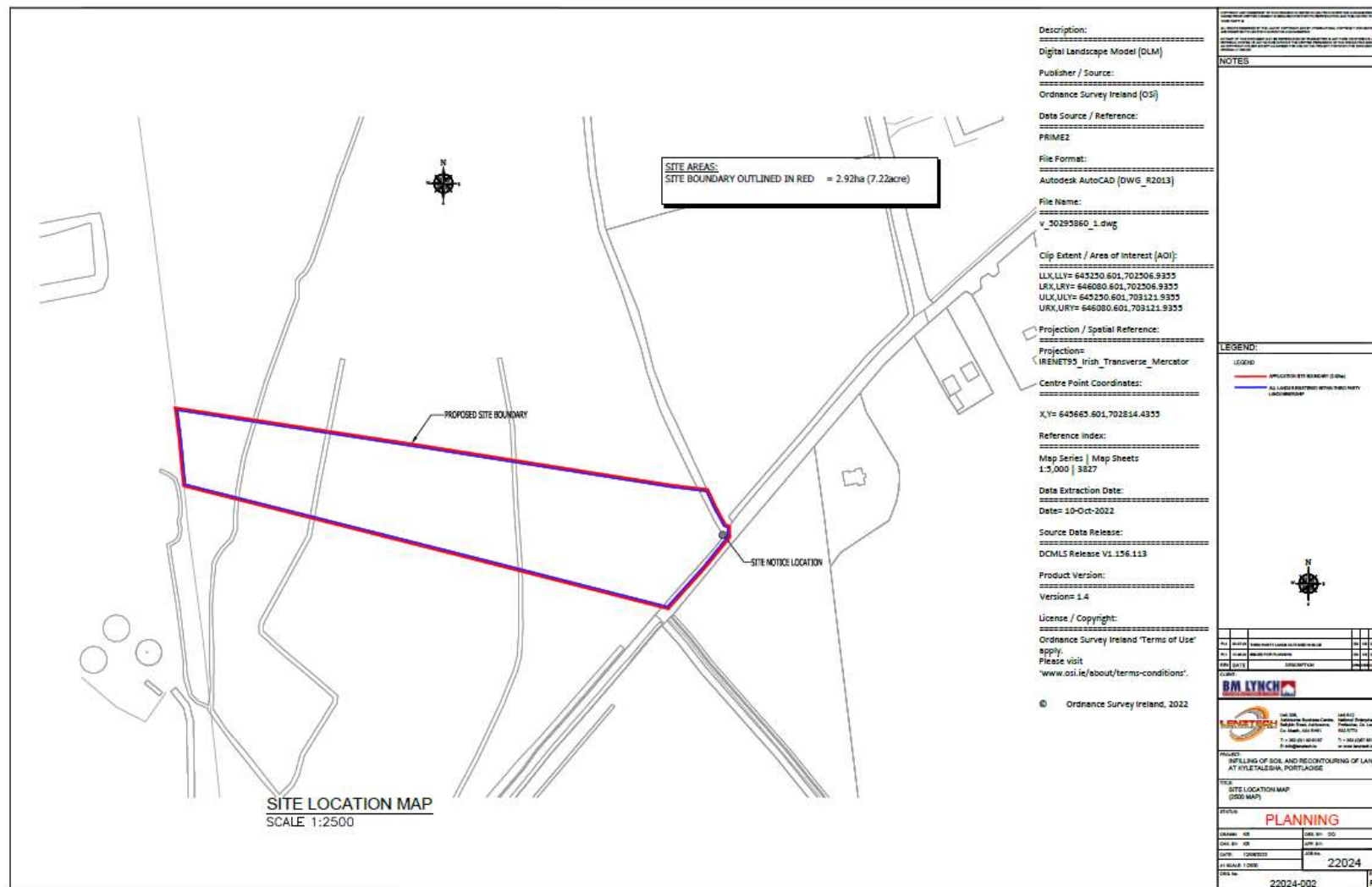


Figure 2-2 Proposed Site Location Plan



A Maximum of 50,250 cubic metres equating to approximately 85,000 tonnes of inert soil and stone shall be imported over a period of approximately 5 years. Importation will be limited to 17,000 tonnes per annum. In addition, a total of 87m³ (150 tonnes) of material will be reused on site from the site preparation stage.

All fill material will comply with Article 27 of the European Communities (Waste Directive) Regulations 2011. The material to be imported meets the criteria for classification as a by-product under Regulation 27 of the same Regulations. No processing of waste is required on site; only clean soil and stone will be brought to site, managed through sampling and testing at the origin. Material classification will follow the TII Specification for Road Works (2024) for Earthworks Materials. Anticipated typical imported materials include Class 5A topsoil, Class 1 general granular fill, Class 2 general cohesive fill and Class U1 non-hazardous material. The proposed infill materials will offer permeability typical of greenfield run-off rates and standard percentage run-off values for soil, reflecting existing drainage patterns. The applicant intends that all material will be sourced locally within a 10 kilometre radius of serviceable zoned development lands in Portlaoise, where the applicant is contracted to provide civil engineering works for residential construction. The Applicant is currently engaged in a number of construction projects within Portlaoise, from which suitable material may arise.

In terms of phasing, It is envisaged that the low lying lands will be infilled from an east to west direction allowing the lands to be trafficked from east to west without the requirements for excessive haul roads to the extreme western boundary. Material will be graded in 200-250mm thick layers to the identified finished levels through the use of suitable plant and equipment such as a 360deg excavator and a track dozer.

A 10-meter buffer will be maintained along the western boundary of the site where no soil importation shall take place to retain the cover of birch and willows.

The sequence of infilling works will be undertaken on a phased basis. The phasing plan is presented in Figure 2-4 (Volume 3 Appendix 2-3) and comprises four (No. 4) phases, as outlined below.

Phase 1 (Phase 1a and Phase 1b)

Phase 1 will consist of regrading works within the eastern portion of the site. Approximately 25,550 m³ of soil and stone material (33,215 tonnes) will be placed during this phase.

Material will be temporarily stockpiled adjacent to the temporary permeable granular unloading area for subsequent regrading. Temporary silt-containment barriers will be installed at all identified bog drains to protect downstream watercourses.

Phase 2

Phase 2 will involve regrading works in the central portion of the site. Approximately 22,250 m³ (28,925 tonnes) of material will be placed during this phase.

The area previously infilled during Phase 1 (eastern section) will be regraded and recontoured, followed by additional infilling within the Phase 2 area.

Phase 3

Phase 3 will comprise regrading works within the western portion of the site. Approximately 18,200 m³ (23,660 tonnes) of material will be placed during this phase.

The area infilled during Phase 2 will be regraded and recontoured during this phase, with infilling undertaken thereafter. The temporary haul route will be extended progressively to facilitate the regrading works.

Phase 4 (Completion Stage)

Phase 4 will comprise the completion and final recontouring of the site. The western area infilled during Phase 3 will be regraded and recontoured to achieve the final landform.

Upon completion of the regrading works, the temporary haul route and all associated granular material will be fully removed.

The re-profiling of the surface will be carried out to allow for the planting of native grassland and will be supervised by a qualified landscape architect to ensure that the filling is carried out in a manner that will derive maximum benefit from this.



Source Control stormwater management will be used for run-off from the access road and hardstanding areas, with infiltration measures provided as close to source as possible to minimise hydrologic impact on existing drainage ditches and watercourses. Access road run-off will be collected by road gullies, routed to catchpit manholes with integrated silt collection sumps, then passed through a bypass separator before disposal to ground via an on-site infiltration trench sized in accordance with BRE Digest 365 Soakaway Design and wrapped in geotextile as part of the filtering system. Existing drainage features, including drainage ditches and bog drains, will be identified and surveyed prior to commencement, retained, and any required modification will be undertaken in accordance with Series 600 of the TII Specification for Road Works and the NRA Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes. Drains will be filled with clean washed Clause 6A material without fines or dust and wrapped in geotextile that allows water to flow in all directions. Material will be placed by end tipping without compaction. Run-off from exposed soils will be intercepted by silt containment barriers installed in advance of receiving drainage features.

Up to five haulage vehicles may be used during peak bulk excavation periods. Each vehicle will be recorded and logged at departure from the source site for control and quantity monitoring. Daily records will be maintained at the source of origin by the plant operator or banksman loading vehicles, or alternatively by main site access or security personnel at the construction site entrance. The site logbook will be collected daily by the contracts manager. These data will be available for inspection at all times by the licensing body. For irregular or once-off low-volume deliveries, a designated operator and keyholder will manage access to ensure that only suitable licensed material is accepted. Prior to deposition, the consignment note for each load will be inspected by the site supervisor and each load will be evaluated in accordance with the site's waste acceptance procedure.

Acceptance of material will occur between 08:00 and 17:00 Monday to Friday and infrequently between 09:00 and 13:00 on Saturdays, with no operations on Sundays or Bank Holidays. No site lighting is proposed and deliveries will occur only during daylight hours to avoid artificial lighting and light spill.

Plant and wheel washing facilities and road sweepers will be provided as required to prevent mud or deposits entering the public road network. Washing facilities will be located on designated hard standings at least 10 metres from the nearest watercourse or drain. The selection of any wheel wash system will be confirmed prior to construction and as part of any Article 27 application. The option of a dry wheel wash system by Conquip is currently proposed and is suited for heavy machinery and delivery or muck away vehicles to ensure that local roads are kept clean. The Conquip wheel wash is suited to remote locations as it does not require a water supply to function.

2.5 Construction Phase of the Proposed Development

The construction phase of the Proposed Development is anticipated to last a duration of 5 days and will require the clearance of majority self-seeded trees and vegetation across the site, together with a series of enabling works to prepare the area for the subsequent infilling and regrading operations. The roadside boundary hedge on the northern and eastern sides of the site will require partial removal as necessary to facilitate sightlines and access. As the land parcel is comprised of cutover bog, there is no defined internal hedgeline or fenceline. Upon

first establishing and delineating the registered boundary, any trees or planting along the boundary will, where possible, be retained.

These preparatory works will also include the installation of temporary site fencing, the establishment of buffer strips to adjoining lands, the protection of existing site drainage infrastructure, the construction of a Temporary Construction Compound (TCC), and the formation of the site access, including road widening works.

The location of all drainage features will be identified and surveyed prior to commencement for record and maintenance purposes, and all existing drainage ditches and bog drains will be retained.

The construction phase will include the establishment of a TCC, approximately 11.5 m² in size, as shown on Figure 2-5. The TCC is expected to accommodate a temporary modular building which will be used for site offices, monitoring of incoming vehicles, and welfare facilities, including toilets with sealed waste storage for off-site removal. It will also provide parking for construction staff, visitors, and construction vehicles, secure storage for tools and small parts, a small reception area, and a fuelling point or mobile fuel bowser operated in accordance with CIRIA best-practice guidelines. The TCC will be in use for the duration of the operational infilling stages.

Welfare facilities will be provided for the full duration of the construction and operational period. These facilities will include provisions for waste management, refuelling, power supply, potable water, and the safe storage of chemicals and materials. The TCC will be formed by stripping and regrading the topsoil, followed by the installation of a geotextile membrane and a layer of imported stone. The stripped topsoil will be stored adjacent to the compound within a linear bund typically no greater than 2 m in height. Superficial soil will be stripped and stored separately from the topsoil, and will be stored in a similar manner, subject to the volume of material requiring excavation. Uncontaminated surface run-off from the compound will be directed to a swale or infiltration area to prevent discharge to the existing drainage ditch. All other run-off from the wider site will continue to follow existing natural drainage patterns and newly installed drainage routes.

Upon completion of the operational phase (as detailed in Section 2.4 Phase 4 (Completion Stage), the compound area will be reinstated. Reinstatement works will include the removal of imported granular material and the underlying geotextile, the gentle ripping of the exposed substrate, and the replacement of the stored superficial soil and topsoil. The surface will then be re-seeded as required. Where ground conditions allow, inert materials such as the imported stone may be retained in place, with reinstatement achieved through the replacement of stored soils. In these circumstances, the area would be kept on record and could be reused as the Temporary Construction Compound during any future decommissioning phase.

Welfare facilities will comply with the Health and Safety Authority (HSA) Requirements for Construction Site Welfare Facilities (2017). Facilities will include mobile toilets and/or self-contained welfare cabins with sealed waste storage, with all sewage waste collected and tankered off-site by a licensed waste contractor. Potable water will be provided in the form of bottled water for drinking and messing purposes, while welfare units are likely to incorporate built-in water bowsers for sanitation. Electricity will be supplied by on-site generators.

The proposed site access is via the local gravel access lane. It is proposed that the local gravel access lane will be widened for a length of 33m from the junction with the public road. This will result in the local access lane widening from 3.1m to 6.5m.

The layout of the access arrangements is shown in Figure 2-5 (Volume3: Appendix 2-4). Typical construction for the upgraded access will consist of a granular CL6F2 capping layer on a geotextile membrane and either a 150 mm granular sub-base topped with a 150 mm concrete slab, or a 220 mm dense bitumen macadam surface comprising a 40 mm wearing course, a 60 mm binder course and a 120 mm dense bitumen macadam basecourse.



Figure 2-5 Site Layout outlining Temporary Construction Compound and Road Upgrade Works

2.6 Cumulative Schemes

Cumulative effects are considered in this EIAR in line with Section 3.7.3 of the EPA Guidelines on the *Information to be Contained in Environmental Impact Assessment Reports* (2022).

Extant permissions and current live planning applications that have been taken into consideration for the purposes of determining cumulative effects are detailed in Table 2-2. For the purpose of this assessment planning applications within the jurisdiction of Laois County Council was considered, given the proximity of the site.

Each of the technical chapters in this EIAR will assess the potential for cumulative effects with the projects set out above in Table 2-1, with the Proposed Development.

Application Reg. Ref.	Address	Development Proposal	Decision Date
LCC planning ref: 2560308	Kyletalesha & Kyleclonhobert, Portlaoise, County Laois, R32W978	The continued use of the site and premises from the 1st January 2026 as a waste transfer and processing facility, consistent with the extant permission Reg. Ref. 15/403. An Environmental Impact Assessment Report (EIAR) has been prepared in respect of the proposed development.	24/10/2025 LCC: Conditional.

2.7 Description of Alternatives

Under Article 5(1)(d) of the EIA Directive 2011/92/EU, as amended by Directive 2014/52/EU, developers are required to provide:

“A description of the reasonable alternatives studied by the developer which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment.”

Article 5(1)(f) of the EIA Directive requires that the EIAR contains the following:

“any additional information specified in Annex IV relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected.”

Further detail is provided in Annex IV of the Directive, which states:

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

In the Irish context, Schedule 6, Paragraph 1(d) of the Planning and Development Regulations 2001, as amended, mirrors this requirement:

“A description of the reasonable alternatives studied by the person or persons who prepared the EIAR, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the proposed development on the environment.”

This legal framework ensures that the EIAR presents a transparent and environmentally informed rationale for the selected development option, supported by a representative range of practicable alternatives. The approach taken in this chapter is consistent with the guidance provided in the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022), which emphasise that while a detailed assessment of each alternative is not required, the main alternatives should be described with reference to environmental considerations and the rationale for the chosen option.

This section of the EIAR provides an explanation of the reasonable alternatives to the proposed development examined throughout the design and consultation process. This serves to indicate the main reasons for choosing to proceed with the Proposed Development, taking into account and providing a comparison of the environmental effects of the Proposed Development and alternatives. The alternatives to the Proposed Development may be described at four levels:

- Alternative locations;
- Alternative designs;
- Alternative layouts; and
- Alternative processes.

Pursuant to Section 3.4.1 of the Environmental Protection Agency (EPA) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022), the consideration of alternatives also needs to be cognisant of the fact that *“in some instances some of the alternatives described below will not be applicable - e.g. there may be no relevant ‘alternative location’...”*

In accordance with EPA Guidelines (EPA, 2022), different types of alternatives may be considered at several key phases during the process. As environmental issues emerge during the preparation of the EIAR, alternative designs may need to be, and if necessary, will be considered early in the process or alternative mitigation options may need to be considered towards the end of the process.

The EPA Guidelines (EPA, 2022) states:

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

The following sections of this chapter of the EIAR contains an analysis of the alternative development options for the site, describing design options and changes which were incorporated into the scheme as the proposals progressed. The key considerations and amendments to the design of the scheme, having regard to and comparing the key environmental effects, are set out and discussed.

2.7.1 Alternative Locations

Once the need for a suitably located infill facility was identified, the Applicant examined the alternatives available. There were three main alternatives considered in terms of the Proposed Development. These options were as follows:

1. The Do-Nothing Alternative
2. Develop another greenfield site
3. Develop another site owned by the Applicant

The Do-Nothing Alternative would see the site remain as an overgrown, uncultivated peatland over an area of approximately 2.52 ha. A “do-nothing” scenario was considered to represent an underutilisation of a landholding that is geographically well placed to accommodate a controlled infill activity and to support the efficient management of excavated materials arising from regional construction works. Importantly, the site is also well placed to suit the ever-growing needs of the residential construction industry by providing a suitable and compliant location for the placement of surplus soils generated by housing and infrastructure development.

For another greenfield site to be developed, it is deemed that a greater impact would be created by establishing an infill facility on lands that may currently be in productive agricultural use, or require new access roads, drainage and service infrastructure. By comparison, the Proposed Development site is characterised by modified, uncultivated peatland that can accommodate the proposed development with fewer associated impacts. Therefore, it is considered logical that the Proposed Development proceed at this location rather than create new impacts on an alternative greenfield site.

The option of developing another site owned by the Applicant was also examined. However, other lands within the Applicant’s ownership do not offer the same strategic locational advantages or the existing access infrastructure that the Proposed Development site possesses. The site’s proximity to regional transport corridors allows for efficient routing, minimising vehicle-kilometres travelled and associated emissions. When considered alongside the physical characteristics of the lands, these factors collectively indicate that the Proposed Development site represents the most suitable and sustainable location available. The most suitable option for managing surplus soils is one that minimises haul distance and associated emissions, thereby supporting more sustainable construction activity in line with national policy objectives. The Proposed Development is for the remediation of land that is currently of little or no economic or agricultural value.

Having regard to the above it was not considered necessary to consider alternative sites for the Proposed Development.

2.7.2 Alternative Uses

If the Proposed Development is not advanced, the site will remain as overgrown, uncultivated peatland. In their current state these lands have value for biodiversity.

2.7.3 Alternative Design & Layouts

The Proposed Development has been designed to ensure maximum layout efficiency. It is considered that the layout of the scheme as proposed is the optimal solution for the lands. It is further considered that the design ensures that the development potential of a strategically

positioned and underutilised plot is maximised. It is the view of the designers that the final design assessed in this EIAR is the most efficient layout and that which represents the least possible environmental impact. Design considerations included environmental and nuisance mitigation measures.

2.7.4 Alternative Process

Due to the nature of the Proposed Development, (i.e. infilling activities) where the EIAR will be submitted to An Coimisiún Pleanála it was not considered necessary to consider alternative processes for the Proposed Development.

2.8 The Existence of the Project

The project will commence once the required consents have been obtained from the Planning Authority, with the projected infilling and remediation of the site being completed within 5 years from commencement of site operations.

The Proposed Development comprises the controlled infilling and remediation of a cutover bog to stabilise the existing ground conditions and render the lands suitable for productive agricultural use, potential forestry, amenity, or other uses within these low-lying agricultural lands.

The primary direct environmental effects will occur during the operational phase, when infilling, grading and associated traffic movements take place. Following the completion of restoration works, the site will be returned to agricultural use, potential forestry, amenity use, or other appropriate land uses within these low-lying lands resulting in a long-term positive environmental outcome through the rehabilitation of previously degraded lands.

All likely significant environmental effects have been assessed in the relevant specialist chapters of this EIAR. The Proposed Development also has the potential for cumulative, secondary and indirect effects. All interactions and cumulative effects have been addressed in Chapter 16 (Interactions) with cumulative effects and interactions fully addressed in the relevant specialist chapters of this EIAR.

3 PLANNING AND POLICY

3.1 Introduction

This chapter considers the Proposed Development in terms of legislative context and in relation to strategic, national, regional and local level planning policies and objectives.

This Application is made under section 34(2)(a) of the Planning and Development Act 2000, as amended, where it is acknowledged that a planning authority is restricted to considering proper planning and sustainable development with regard being had to the following matters:

- (i) the provisions of the development plan,
- (ii) the provisions of any special amenity area order relating to the area,
- (iii) any European site or other area prescribed for the purposes of section 10(2)(c),
- (iv) where relevant, the policy of the Government, the Minister or any other Minister of the Government,
- (v) the matters referred to in subsection (4), and
- (vi) any other relevant provision or requirement of this Act, and any regulations made thereunder.

The following sections of this chapter have sought to comprehensively address the strategic and statutory context governing the planning and development of the Proposed Development,

3.1.1 Quality Assurance and Competency of Experts

This chapter has been prepared by Rachel Redmond, Environmental Consultant with DNV. Rachel has a Bachelor of Science (Hons) in Environmental Science from University College Cork and a Sp.Dip in Corporate Environmental Planning. Rachel has over 4 years of experience as an environmental consultant preparing Environmental Impact Assessment Reports of a similar scale and nature to the Proposed Development.

This chapter has been reviewed by Mairéad Foran, Senior Environmental Consultant with DNV. Mairéad Foran has a B.A. (Moderatorship) in Environmental Sciences from Trinity College Dublin, and an Advanced Diploma in Planning and Environmental Law from King's Inns College, Dublin. Mairéad has over 6 years professional experience as an Environmental Consultant and experience working on a large number of EIARs and EIA Screening Reports for projects of a similar scale to that of the Proposed Development.

This chapter has been reviewed and approved by Catherine Keogan, Technical Director and EIA Lead at DNV. Catherine is an environmental consultant with 37 years' experience in consultancy, specialising in EIAs for large-scale residential, commercial developments, pharmaceutical, BESS and solar projects working closely with a range of developers, planning consultants and architects within the public and private sector. Catherine has a B.Sc. (Hons)

in Analytical Science and a Post Graduate Diploma in Renewable Energy Technology Systems.

3.2 Project Background and Planning History

3.2.1 Proposed Development

Planning was sought from Laois County Council for an infill site and recontouring of the land together with all associated site works on 6th July 2023 (planning reference number: 23200).

Laois County Council requested further information for the Proposed Development on 29th August 2023. The further information was issued to Laois County Council 4th March 2024.

Permission was granted by Laois County Council for the Proposed Development on 27th March 2024, and the application was appealed on 23rd April 2024.

An Coimisiún Pleanála requested on 2nd July 2025 that an Environmental Impact Assessment Report is carried out (planning reference number: PL11.319585) due to the following:

“The proposed development involves the reclamation of low lying, wetlands and as such would trigger An Environmental Impact Assessment Report (EIAR) under Part 2 of Schedule 1 of the Planning and Development Regulations 2001 as amended, under class 1 (c) - development for the carrying out reclamation of wetlands where more than 2 hectares of wetlands would be affected. The site area is stated as 2.92 hectares and the threshold for this 2 hectares. The lands are described in the submitted Appropriate Assessment Screening Report as the eastern part of the Clonreher Bog, which is a Natural Heritage Area.”

3.2.2 Site History

There are no other previously granted planning applications or refused planning applications at the site.

3.3 Study Methodology

The following policies, guidance and legislation have been reviewed with regards to the Proposed Development.

3.3.1 European and National Policy and Legislation

Directive 2011/92/EU (as amended by Directive 2014 /52/EU) (together, the EIA Directive) was enacted as a means to assess the effects of projects on the environment, and to properly ensure that any potential significant effects are assessed before a project proceeds.

Article 1(2)(g) of Directive 2011/92/EU, as amended by Directive 2014/52/EU, defines Environmental Impact Assessment (EIA) as a process consisting of:

- (i) *the preparation of an environmental impact assessment report by the developer, as referred to in Article 5(1) and (2);*

- (ii) *the carrying out of consultations as referred to in Article 6 and, where relevant, Article 7;*
- (iii) *the examination by the competent authority of the information presented in the environmental impact assessment report and any supplementary information provided, where necessary, by the developer in accordance with Article 5(3), and any relevant information received through the consultations under Articles 6 and 7;*
- (iv) *the reasoned conclusion by the competent authority on the significant effects of the project on the environment, taking into account the results of the examination referred to in point (iii) and, where appropriate, its own supplementary examination; and*
- (v) *the integration of the competent authority's reasoned conclusion into any of the decisions referred to in Article 8a.'*

Annex 1 of the EIA Directive defines mandatory projects that require an Environmental Impact Assessment Report (EIAR) (formerly EIS) and Annex II of the EIA Directive lists projects which do not necessarily have significant effects but can be subject to case-by-case analysis or thresholds to be determined by member states.

The requirement for a statutory Environmental Impact Assessment (EIA) is set out in the mandatory and discretionary provisions of the Planning and Development Act, 2000 (as amended) (the Act) and in Schedule 5 of the Planning and Development Regulations, 2001 as amended (the Regulations).

Projects listed in Schedule 5, Part 1, of the Regulations, will be subject to mandatory assessment (Article 4(1) of Directive 2011/92/EU, as amended by Directive 2014/52/EU) as they are deemed as projects which are likely to have a significant effect. The Proposed Development is not listed as a project under Schedule 5, Part 1, of the Regulations.

Schedule 5, Part 2 of the Planning and Development Regulations 2001 as amended, defines projects that are assessed on the basis of set mandatory thresholds for each of the project classes including:

"Schedule 5, Part 2 - Agriculture, Silviculture and Aquaculture

- (1)(c) Development consisting of the carrying out of drainage and/or reclamation of wetlands where more than 2 hectares of wetlands would be affected.*

The site constitutes a wetland area and therefore the above threshold applies. The Proposed Development is approximately 2.92 hectares in size which is greater than the 2 hectares threshold criteria. Accordingly, an EIAR is being prepared as part of this application.

In May 2022, the EPA published the final *"Guidelines on the information to be contained in Environmental Impact Assessment Reports"*. The Guidelines have been updated following the introduction of transposing legislation and are now formally adopted. The preparation of these updated Guidelines has involved extensive consultation. Participants in this consultation included government departments, national agencies, regional and local government, independent statutory bodies, non-governmental organisations, members of the public,

developers and bodies representing various professional, industrial and sectoral groups. The Guidelines emphasise the importance of the methods used in the preparation of an EIAR to ensure that the information presented is adequate and relevant. This document has been used in the preparation of this EIAR.

The EIA Directive requires the EIAR to identify, describe and assess, in an appropriate manner and in light of each individual case, the direct, indirect and cumulative significant effects of the Proposed Development on factors of the environment including:

- (a) *Population and human health*
- (b) *Biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC (respectively, the Habitats Directive and the Birds Directive)*
- (c) *Land, soil, water, air, and climate*
- (d) *Material assets, cultural heritage, and the landscape*
- (e) *The interaction between the factors referred to in points (a) to (d)*

Section 172 of the Planning and Development Act 2001, as amended, provides the legislative basis for mandatory EIA. It states the following:

“An environmental impact assessment shall be carried out by the planning authority or the Board, as the case may be, in respect of an application for consent for proposed development where either —

(a) the proposed development would be of a class specified in —

- i) Part 1 of Schedule 5 of the Planning and Development Regulations 2001, and either*
 - I) such development [would equal or exceed, as the case may be, any relevant quantity, area or other limit specified in that Part, or*
- (II) no quantity, area or other limit is specified in that Part in respect of the development concerned,*

or

- (ii) Part 2 [(other than subparagraph (a) of paragraph 2)] of Schedule 5 of the Planning and Development Regulations 2001 and either —*
 - (I) such development [would equal or exceed, as the case may be, any relevant quantity, area or other limit specified in that Part, or*
 - (II) no quantity, area or other limit is specified in that Part in respect of the development concerned,*

or

- (b) (i) the proposed development would be of a class specified in Part 2 of Schedule 5 of the Planning and Development Regulations 2001 but [does not equal or exceed, as the case may be,] the relevant quantity, area or other limit specified in that Part, and*

- (ii) *it is concluded, determined or decided, as the case may be, —*
- (I) *by a planning authority, in exercise of the powers conferred on it by this Act or the Planning and Development Regulations 2001 (S.I. No. 600 of 2001),*
- (II) *by the Board, in exercise of the powers conferred on it by this Act or those regulations,*
- (III) *by a local authority in exercise of the powers conferred on it by regulation 120 of those regulations,*
- (IV) *by a State authority, in exercise of the powers conferred on it by regulation 123A of those regulations,*
- (V) *in accordance with section 13A of the Foreshore Act, by the appropriate Minister (within the meaning of that Act), or*
- (VI) *by the Minister for Communications, Climate Action and Environment, in exercise of the powers conferred on him or her by section 8A of the Minerals Development Act 1940, that the proposed development is likely to have a significant effect on the environment.”*

In some cases, Member States have also established “*exclusion*” or “*negative*” lists specifying thresholds and criteria below which EIA is never required or below which a simplified EIA procedure applies. There may be exceptions to the negative thresholds, for example, for projects in defined sensitive locations. Such exceptions will apply in the case of Habitats Directive 92/43/EEC (as amended) assessments. The use of exclusion lists, defining thresholds below which EIA is never required, is very limited in the EU Member States.

3.3.2 National Planning Policy Context

3.3.2.1 National Planning Framework Plan (NPF)

The NPF is the Government’s high-level strategic plan for shaping the future growth and development of Ireland to the year 2040. The NPF is published together with a 10-year national investment plan as one vision – Project Ireland 2040, meaning that implementation of the Framework will be fully supported by the Government’s investment strategy for public capital investment and investment by the State sector in general. The NPF outlines key future planning and development place making policies for the Eastern and Midland Regions, including a major new policy emphasis on renewing and developing existing settlements. While the Proposed Development does not comprise residential development in itself, it plays an important enabling role in the delivery of new housing. The Proposed Development provides a location for the placement of surplus materials arising from regional construction works, including residential and infrastructure developments. In this regard, it supports the efficient and sustainable delivery of housing in accordance with compact growth objectives set out in the NPF.

Project Ireland 2040 includes a vision and strategy that is supported by a series of National Policy Objectives and will be aligned with the Government’s ten-year National Investment Plan. The Strategy promotes:

- Compact Growth;
- Enhanced Regional Accessibility;

- Strengthened Rural Economies and Communities;
- High Quality International Connectivity;
- Sustainable Mobility;
- A Strong Economy, supported by Enterprise, Innovation and Skills;
- Enhanced Amenities and Heritage;
- Transition to a Carbon Neutral and Climate Resilient Society;
- Sustainable Management of Environmental Resources; and
- Access to Quality Childcare, Education and Health Services.

National Policy Objective 53 states:

“Support the circular and bio economy including in particular through greater efficiency in land management, greater use of renewable resources and by reducing the rate of land use change from urban sprawl and new development.”

National Policy Objective 56 states:

“Sustainably manage waste generation, investing in different types of waste treatment and support circular economy principles, prioritising prevention, reuse, recycling and recovery, to support a healthy environment, economy and society.”

Section 5.4 of the NFP: Planning and Investment to Support Rural Job Creation, recognises the key role of Aggregates and Minerals extraction, in creating an environment to support job creation in rural areas, which will be a key enabler to rejuvenating rural towns and villages, sustaining vibrant rural communities and reversing population decline.

In addressing the environmental challenges, and in support of environmental policy at European and national level, the Plan promotes the aim of Resource Efficiency and Transition to a Low Carbon Economy by:

- Sustainable Land Management and Resource Efficiency - Adopting the principles of the circular economy to enable more sustainable planning and land use management of our natural resources and assets;
- Low Carbon Economy - Our need to accelerate action on climate change;
- Renewable Energy - Our transition to a low carbon energy future; and
- Managing Waste - Adequate capacity and systems to manage waste in an environmentally safe and sustainable manner.

In summary, the Proposed Development aligns with the strategic objectives of the National Planning Framework by supporting compact growth, sustainable land use and the transition to a circular economy. While the Proposed Development does not comprise residential development, it plays an important enabling role in the delivery of housing and infrastructure by providing a location for the placement and reuse of surplus inert materials arising from construction activity. In this regard, the Proposed Development supports the efficient implementation of national planning policy objectives in a sustainable and resource-efficient manner.

3.3.2.2 Guidelines for Planning Authorities on ‘The Planning System and Flood Risk Management (November 2009)’

The Planning System and Flood Risk Management Guidelines were published by the Minister for the Environment, Heritage & Local Government in November 2009 under Section 28 of the Planning & Development Acts 2000 to 2022.

The Planning System and Flood Risk Management Guidelines require the planning system at all levels to avoid development in areas at risk of flooding, particularly floodplains, unless there are proven wider sustainability grounds that justify appropriate development and where the flood risk can be reduced or managed to an acceptable level without increasing flood risk elsewhere; adopt a sequential approach to flood risk management when assessing the location for new development based on avoidance, reduction and mitigation of flood risk; and incorporate flood risk assessment into the process of making decisions on planning applications and planning appeals.

As indicated in the Planners Report (Application Reference: 23/200) (LCC, 2023), the site is outside the confines of the critical Flood Zones A and B as indicated in the Strategic Flood Risk Assessment of the Plan.

An initial review of flood risk information was conducted for the site and Proposed Development based on information available from floodinfo.ie (OPW, 2026). This assessment involved an initial flood risk assessment to determine if there were any potential flooding or surface water management issues that might affect the site or the Proposed Development. The results of the initial flood risk assessment indicated that there is no significant flood risk to the site. Consequently, the Proposed Development is deemed appropriate for the site, which is classified as Flood Zone C, indicating a low probability of flooding. Additionally, the initial flood risk assessment stated that there was no past flood events recorded within a 2.5km radius of the site.

3.3.2.3 Climate Action Plan 2025

Ireland’s Climate Action Plan 2025 (CAP25) is the third statutory annual update under the Climate Action and Low Carbon Development (Amendment) Act 2021 and builds on the published 2024 plan. The Plan focuses on reducing emissions and increasing energy efficiency through achieving national climate objectives by 2050.

CAP25 supports circular economy practices to optimise resource use within Ireland. The Proposed Development aligns with CAP25’s measures which encourages and supports sustainable material use. The Proposed Development operational phase comprises the importation of excavated inert soil and stone arising from local greenfield residential development sites in Portlaoise. The infilling of soil and regrading of land will support future agricultural activity, potential forestry, amenity use, or other appropriate land uses within these low-lying lands, which represents the intended end use of the Proposed Development.

The Proposed Development aligns with the objectives by facilitating the beneficial reuse of materials arising from local and regional construction projects, including residential and infrastructure developments within the Portlaoise area. By providing a destination for surplus excavated materials, the Proposed Development reduces the requirement for long-distance haulage to landfill, thereby contributing to reduced greenhouse gas emissions and more efficient resource use.

Furthermore, the regrading and infilling of the site will result in the stabilisation and improvement of low-lying lands with appropriate land uses. In this way, the Proposed Development represents a practical application of circular economy principles, consistent with CAP25 objectives to optimise material use, reduce waste and support climate-resilient land management.

3.3.3 Regional Planning Context

3.3.3.1 Eastern & Midland Regional Assembly - Regional Spatial & Economic Strategy (2019)

The Eastern & Midland Regional Assembly Regional Spatial & Economic Strategy 2019-2031 (hereafter RSES) were adopted in 2019 to ensure the policies and objectives of the NPF are implemented at a regional level.

The vision of the Strategy is *“to create a sustainable and competitive Region that supports the health and wellbeing of our people and places, from urban to rural, with access to quality housing, travel and employment opportunities for all”*. The three key principles outlined within the Strategy include:

- *Healthy Placemaking: To promote people’s quality of life through the creation of healthy and attractive places to live, work, visit, invest and study in.*
- *Climate Action: The need to enhance climate resilience and to accelerate a transition to a low carbon society recognising the role of natural capital and ecosystem services in achieving this.*
- *Economic Opportunity: To create the right conditions and opportunities for the Region to realise sustainable economic growth and quality jobs that ensure a good living standard for all.*

3.3.4 Local Planning Context

3.3.4.1 Laois County Development Plan 2021 - 2027

In accordance with the Laois County Development Plan 2021–2027, the Proposed Development site is located within an *“Area under Strong Urban Influence”* and lies approximately 2.5 kilometres from both existing and proposed residential zoned lands.

The Laois County Development Plan 2021 – 2027 (CDP) sets out the framework for sustainable development of County Laois.

The vision of the CDP is *“to improve the quality of life for all citizens in County Laois by creating sustainable communities and an environment that supports a vibrant, growing and well connected economy, making it a county where people want to live, work, visit and do business, without compromising the environmental integrity of the county”*.

The objectives include:

- *To provide a framework for the future sustainable development of the county, defining acceptable forms of development and where they should be directed;*
- *To support and facilitate and promote a transition to a low carbon society;*
- *To provide a detailed basis for the promotion and management of development;*
- *To implement National and Regional development policy provisions at a county level;*

- *To promote and assist Laois's economic development opportunity and encourage increased resilience in the County's enterprise;*
- *Support and respect the rights of the citizens of County Laois with respect to public participation in the planning process in accordance with EU and National legislation.*

Portlaoise is identified as being a key town within the CDP and in line with the RSES. The CDP outlines the following objectives for the town:

CS 12: Support the continued growth and sustainable development of Portlaoise to act as a growth driver in the region and to fulfill its role as a Key Town as outlined in the Regional Spatial and Economic Strategy 2019.

CS 13: Direct population into the Key Town to ensure that population growth is appropriate in scale with its identified role in the Regional and County Settlement Hierarchy.

CS 14: Require sustainable, compact, sequential growth in Portlaoise by consolidating the built up footprint¹³ with a focus on the redevelopment and regeneration of infill and brownfield sites.

CS 15: Apply increased residential densities where appropriate having regard to Sustainable Residential Developments in Urban Areas (2009) and apply appropriate development management measures in ensuring growth is appropriate and in compliance with the RSES 2019.

CS 16: Implement the actions of the 'Portlaoise Public Realm Strategy "2040 And Beyond: A Vision For Portlaoise' to improve the character of the town of Portlaoise.

CS 17: Support and facilitate the transition of Portlaoise to a low carbon centre of excellence in accordance with RPO 4.72 of the RSES.

Additional objectives are outlined throughout the CDP of which the following are relevant to the Proposed Development:

CS 05: Support the regeneration of underused town centre and brownfield/infill lands along with the delivery of existing zoned and serviced lands to facilitate population growth and achieve sustainable compact growth targets of 30% of all new housing to be built within the existing urban footprint of targeted settlements in the County.

CM BE 1: Achieve more compact growth by promoting the development of infill and brownfield/ regeneration sites and the redevelopment of underutilised land within and close to the existing built up footprint of existing settlements in preference to edge of centre locations;

ES 15 Develop a 10-year roadmap for the strategic planning and development of the Kyletalesha Transfer Station and Civic Amenity Site.

BNH 39 Protect, conserve, preserve, manage and enhance wetlands (including fens and turloughs) from infilling, fragmentation, degradation and protect and conserve their quality, character and features. Resist development (including land reclamation) which would destroy, fragment and degrade wetlands, coastal wetlands, estuarine marshland and control adjacent development by the use of buffer zones.

In addition to the above objectives, it is expected that the Proposed Development will aid in residential and infrastructure developments by accepting soil and stone.

It is evident that the CDP places emphasis on the protection and conservation of wetlands. The Proposed Development site is a cut-over bog that is no longer in use. Ecological surveys have been conducted including a Preliminary Ecological Appraisal and a Habitat Survey. It is considered that, provided the mitigation measures proposed within Chapter 5 Biodiversity are carried out in full, there will be limited and less than significant impacts to Key Ecological Receptor (KER) habitats, species groups or biodiversity as a result of the Proposed Development.

3.3.4.2 Portlaoise Local Area Plan 2024 – 2030

The Portlaoise Local Area Plan 2024 – 2030 (LAP) sets out the strategy for planning and sustainable development of Portlaoise.

The LAP outlines the following policies that are relevant to the Proposed Development:

PCP 1 Support the continued growth and sustainable development of Portlaoise to act as a growth driver in the region and to fulfil its role as a Key Town as outlined in the Regional Spatial and Economic Strategy 2019

PCP 3 Require sustainable, compact, sequential growth in Portlaoise by consolidating the built-up footprint with a focus on the redevelopment and regeneration of infill and brownfield sites

PCP 9 Require projects to be fully informed by ecological and environmental constraints at the earliest stage of project planning and any necessary assessment to be undertaken, including assessments of disturbance to habitats and species, where required

PCO 2 To promote balanced economic development and employment ensuring a diverse range of economic sectors are developed and supported

PCO 5 To focus new residential development into brownfield sites

PCO 7 To require the preparation and assessment of all planning applications in the plan area to have regard to the information, data and requirements of the Appropriate Assessment Natura Impact Report and SEA Environmental Report

PCO 8 To require projects to be fully informed by ecological and environmental constraints at the earliest stage of project planning and any necessary assessment to be undertaken, including assessments of disturbance to habitats and species, where required

CMO 2 Achieve more compact growth by promoting the development of infill and brownfield/ regeneration sites and the re-use of underutilised land including upper floors within and close to the existing built-up footprint in preference to edge of centre locations thereby encouraging a shift towards sustainable travel modes

CMO 19 Ensure biodiversity assets are appropriately managed and safeguarded from potential adverse effects from development.

CMO 21 Support the actions of the Laois Local Authority Climate Action Plan 2024 – 2029 to enhance public realm and conserve and enhance biodiversity

CMO 30 Promote circular economy principles and the incorporation of sustainable waste management measures within developments, in line with the “Best practice guidelines for the preparation of resource & waste management plans for construction & demolition projects” guidance

H 05 To encourage appropriate housing development on infill and brownfield sites subject to preservation of existing residential amenity, the provision of a high quality design respecting the established character, density and layout, compliance with all traffic safety, quantitative and qualitative standards of the Laois County Development Plan 2021 – 2027

ED P5 Encourage, in co-operation with the Local Enterprise Office and Laois Partnership, the development of further small to medium scale industries and services

ED 02 Promote balanced and sustainable economic development and employment, ensuring that a diverse range of economic sectors are developed and supported

3.3.5 Environmental Policy

3.3.5.1 EU Waste Framework Directive and European Community (Waste Directive) Regulations 2011

The Waste Framework Directive 2008/98/EC (as amended by Waste Framework Directive 2018/851/EU) was enacted on the 12th of December 2010 and introduced new provisions in order to boost waste prevention and recycling as part of the waste hierarchy and clarifies key concepts namely, the definitions of waste, recovery and disposal and establishes a legal framework for the treatment of waste both in Europe and Nationally. This Directive was transposed into Irish Law by the European Communities (Waste Directive) Regulations 2011, S.I. No. 126 of 2011-2020. The WFD encourages the prevention of waste through recovery, reuse and recycling as outlined in Article 10 and Article 11 of the Directive.

The Directive also provides the following definition on the term recovery in the context of waste:

“...recovery’ means any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy.”

The Proposed Development is in line with the new waste hierarchy as it is promoting the reuse of inert soil and stone material arising from local greenfield residential development sites in Portlaoise, therefore helping to aid the legal obligations associated with the waste hierarchy.

3.3.5.2 A Waste Action Plan for a Circular Economy–Ireland’s National Waste Policy 2020-2025

This document was published by the Department of Environment in 2021 and sets out the National Policy on waste management. The previous national waste policy ‘A Resource Opportunity - Waste Management in Ireland’ expired in mid-2020. The new Plan identifies

opportunities for the application of circular economy principles across a range of areas such as food, or end-of-waste and by-products, where improvements in the regime can assist in diverting material from waste to beneficial reuse.

The three main guiding principles outlined in this Waste Action Plan which are as follows;

- Shift the focus away from waste disposal and treatment to ensure that materials and products remain in productive use for longer thereby preventing waste and supporting reuse through a policy framework that discourages the wasting of resources and rewards circularity;
- Make producers who manufacture and sell disposable goods for profit environmentally accountable for the products they place on the market; and
- Ensure that measures support sustainable economic models (for example by supporting the use of recycled over virgin materials).

The Proposed Development will assist in reaching Ireland's objective to achieve a circular economy by supporting the reuse of inert materials and discouraging the wasting of resources.

3.4 Summary

Having regard to the policies and objectives of

- European and National Policy
- National Planning Framework (Draft Revision 2025)
- Regional and Spatial and Economic Strategies
- Environmental Policies
- Laois County Council

It is considered that the Proposed Development is consistent with key policy objectives relating to sustainable land use, circular economy principles, climate action and the efficient management of construction materials.

While the policy framework places strong emphasis on the protection of wetlands and ecological resources, the Proposed Development site comprises degraded cut-over bog lands and has been subject to detailed environmental assessment, including ecological surveys and mitigation measures as set out in the relevant chapters of this EIAR.

It is therefore concluded that the Proposed Development accords with the proper planning and sustainable development of the area and is consistent with the relevant planning and environmental policy context.

3.5 References

Directive 2011/92/EU (as amended by Directive 2014 /52/EU) (together, the EIA Directive)

Eastern & Midland Regional Assembly - Regional Spatial & Economic Strategy (2019)

Guidelines for Planning Authorities on 'The Planning System and Flood Risk Management (November 2009)'

Laois County Development Plan 2021 - 2027

National Planning Framework (Project Ireland 2040)

Planning and Development Act 2000, as amended

Planning System and Flood Risk Management Guidelines 2009

Portlaoise Local Area Plan 2024 – 2030

Regional Spatial and Economic Strategy (RSES) 2019-2031

Waste Framework Directive 2008/98/EC (as amended by Waste Framework Directive 2018/851/EU)

A Waste Action Plan for a Circular Economy–Ireland's National Waste Policy 2020-2025

4 POPULATION AND HUMAN HEALTH

4.1 Introduction

This chapter considers the potential effects of the Proposed Development on human beings, living, working and visiting in the vicinity of the site. The chapter details the potential direct and indirect effects of the Proposed Development on the local population and human health.

The chapter on population and human health is broad ranging and covers the existence, wellbeing, and activities of people through the format of considering people as 'groups' or 'populations'. The assessment of effects on human beings involves the identification of relevant key populations that may be affected by the proposal and quantifiable documentary research. Health, as defined by the World Health Organization (WHO), is *"a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity"*.

Key populations have been identified as persons residing and engaging in activities near the site, persons with a stake in the general economy of the local and regional area, and persons enjoying the recreational and cultural amenities of the area.

4.1.1 Quality Assurance and Competency of Experts

This chapter was prepared by Rachel Redmond, Environmental Consultant with DNV. Rachel has a BSc (Hons) in Environmental Science from University College Cork and a Sp.Dip in Corporate Environmental Planning from University of Galway. Rachel has over four years professional experience as an Environmental Consultant, preparing EIA Screening Reports and a range of chapters for EIARs of a similar scale and nature to the Proposed Development.

This report was reviewed by Michelle Gaffney Senior EIA consultant with DNV, with over 5 years' experience in environmental consultancy. Michelle holds a B.A (Hons) in Earth Science from Trinity College and is currently advancing expertise through an MSc in Environmental Sustainability at University College Dublin. Michelle has been involved in the technical input into a range of EIAR Chapters and has been involved in the project management and delivery of a range of EIARs of a similar scale and nature to the Proposed Development.

This chapter has been approved by Catherine Keogan, Technical Director and EIA Lead at DNV. Catherine is an environmental consultant with 37 years' experience in consultancy, specialising in EIAs for large-scale residential, commercial developments, pharmaceutical, BESS and solar projects working closely with a range of developers, planning consultants and architects within the public and private sector. Catherine has a B.Sc. (Hons) in Analytical Science and a Post Graduate Diploma in Renewable Energy Technology Systems.

4.2 Study Methodology

A desk-based study was undertaken in January 2026 to assess information regarding population, age structure, economic activity, employment, and unemployment within the vicinity of the Proposed Development. This study was undertaken in accordance with the following

- Guidelines on the information to be contained in Environmental Impact Assessment Reports, EPA (2022);
- EIA Guide to Effective Scoping of Human Health, IEMA (2022);
- (EUPHA) Human Health: Ensuring a High Level of Protection. A reference paper on addressing Human Health in Environmental Impact Assessment;
- Health Impact Assessment in Planning (IEMA 2020);
- Healthy Ireland - A Framework for Improved Health and Wellbeing 2013 – 2025 (the Healthy Ireland Framework) (Department of Health 2019);
- Environmental Impact Assessment of Projects. Guidance on the Preparation of the Environmental Impact Assessment Report (European Commission 2017 and;
- Guide to Determining Significance for Human Health in Environmental Impact Assessment, Institute of Sustainability & Environmental Professionals (ISEP, formerly IEMA) (2022).

The 2022 Census of Ireland was held on Sunday the 3rd of April 2022. The preliminary results were released on the 23rd of June 2022 with the remaining results being published over several months starting in April 2023.

The scope of this evaluation is based on a review of data available from the Central Statistics Office (CSO), legislation, guidance documents and EIARs.

The potential effects of the Proposed Development on the local population and human health are assessed in this EIAR in relation to:

- Population demographics;
- Socio economic effects;
- Water quality;
- Air quality;
- Climate;
- Noise and vibration;
- Traffic and transport;
- Landscape and visual; and
- General amenity and tourism.

Terms used to quantify the quality, significance and duration and frequency of effects as per EPA Guidelines have been detailed in Chapter 1 of this EIAR (EPA, 2022).

In accordance with the IPH (2021) guidance, “Health Impact Assessment Guidance” the sensitivity of the local population was determined following the methodology set out in Part 4 and as summarised in the Health Sensitivity: Conceptual Model presented in Figure 4-2 below.

The sensitivity of the population was considered taking into account the following indicative criteria as included in the IEMA (2022) “*EIA Guide to Determining Significance for Human Health*” guidance:

- Deprivation;
- Resource sharing;
- Inequalities;
- Community outlook;
- Daily activities;

- Dependencies;
- Health status; and
- Adaptability.

In addition, the health magnitude of effects was considered, taking into account the indicative criteria set out in the IEMA (2022) “*EIA Guide to Determining Significance for Human Health’ guidance*”:

- Scale;
- Duration;
- Frequency;
- Severity;
- Extent;
- Reversibility of the effect; and
- Health services quality implication.

4.2.1 Study Area

No formal national guidance is available on the appropriate study area to focus the assessment of population and human health. The Institute of Public Health in Ireland has issued a document “*Health Impact Assessment Guidance*” (2021) which describes several geographic scales at which health impacts can be assessed ranging from neighbouring community level to international level. As such, professional judgement has been applied in determining the appropriate study areas. Due to the wide reaching and often transient nature of people, the potential effects of the Proposed Development can be experienced at different scales. For example, the impact of air quality on human health will be experienced at a much smaller radius when compared to socio-economic impact which can be experienced at a community or regional level.

When choosing an appropriate study area for the potential effects on population and human health in this chapter, the extent of the area assessed varies. In order to assess baseline population and human health conditions in the wider area, Electoral Divisions (EDs) have been considered. ED’s are the smallest legally defined administrative areas in the State and therefore they were selected as the spatial unit for this assessment. ED’s provide the most detailed and locally relevant demographic data available from the CSO. This allows for a more accurate analysis of population characteristics and potential human health impacts in the immediate vicinity of the proposed development, while also aligning with the spatial units commonly used in planning policy and public health reporting.

When assessing the socio-economic and population demographic effects, the study area consisting of the Borris ED in which the site is located, has been assessed as outlined in Figure 4-1 below.

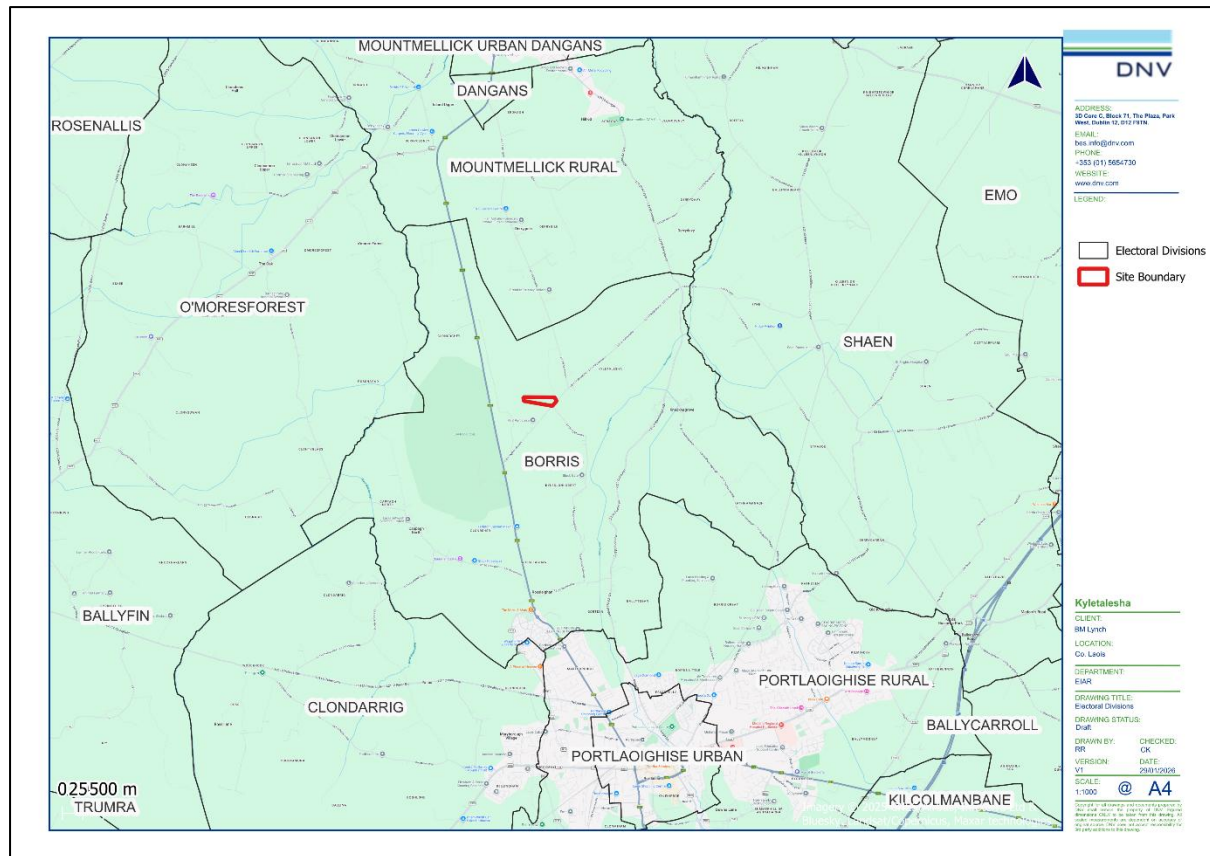


Figure 4-1 Study Area

4.2.2 Information Sources

The principal sources of information are as follows:

- 2022 Census and employment information published by the Central Statistics Office (CSO);
- Laois County Development Plan 2021 – 2027
- Ordinance Survey Ireland (OSI) mapping and aerial photography.

The IPH has issued a document “*Health Impact Assessment Guidance*” (2021) which details the link between human health and the built environment (Figure 4-2). This document also details the negative health impacts associated with unemployment. Unemployment affects both physical and mental health and is an important determinant of health inequalities in adults of working age. Unemployed people have a higher risk of lower levels of psychological wellbeing ranging from symptoms of depression and anxiety to self-harm and suicide. Unemployment can also impact other health determinants for example housing and nutrition. Based on this information, employment generated as a result of the Proposed Development has been assessed throughout this chapter.

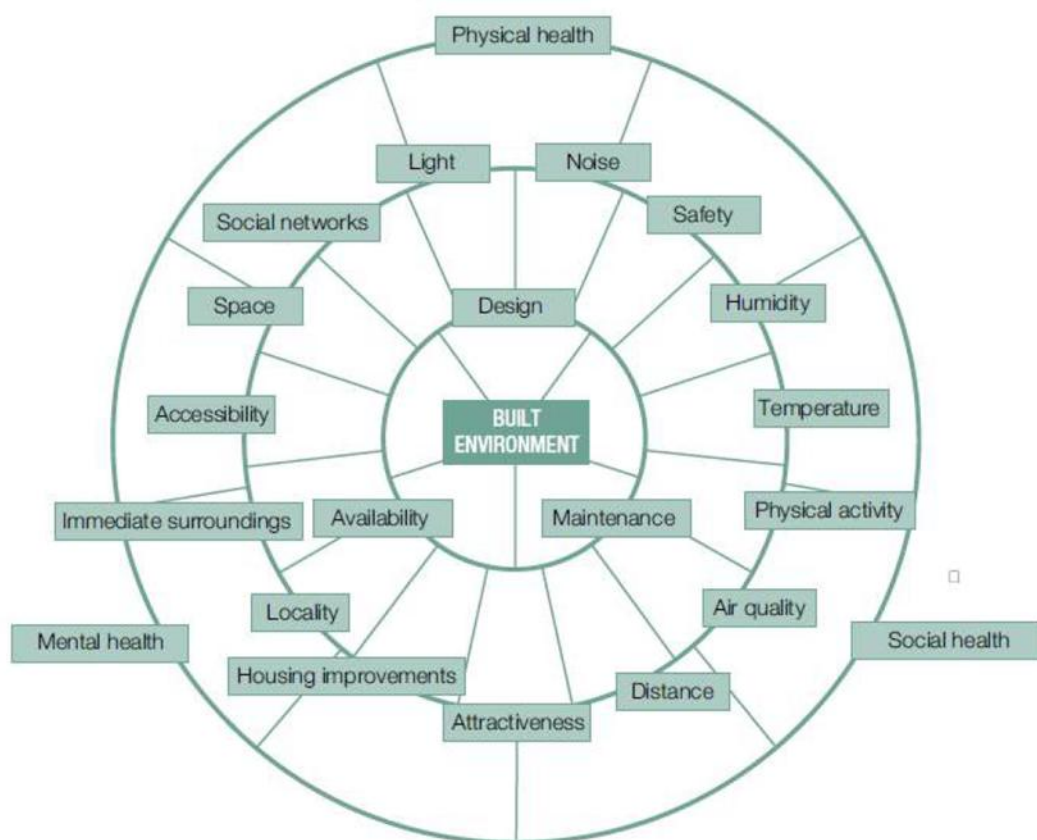


Figure 4-2: Health Impact of the Built Environment (source: Institute of Public Health in Ireland)

The European Commission (EC) has published the “Guidance on The Preparation of The Environmental Impact Assessment Report” (EC, 2017). This document defines human health as “a very broad factor that would be highly Project dependent. The notion of human health should be considered in the context of other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the Project, effects caused by changes in disease vectors caused by the Project, changes in living conditions, effects on vulnerable groups, exposure to traffic noise or air pollutants) are obvious aspects to study”.

Technical chapters within the EIAR have also been reviewed when assessing the likely effects on population and human health. These include the relevant chapters relating to air quality, climate, noise and vibration, hydrology, traffic and transport and landscape and visual.

In line with the Environmental Protection Agency (EPA) “Guidelines on the information to be contained in Environmental Impact Assessment Reports” (2022) (the EPA Guidelines (EPA, 2022), the terms defined when quantifying the quality of effects, are as outlined in Chapter 1.

4.3 The Existing and Receiving Environment (Baseline Situation)

4.3.1 Population and Demographic Analysis

The most recent population figures published by the Central Statistics Office (CSO), indicate that the combination of a net inward migration and high birth rates have resulted in the population of the 26 counties of the State having exceeded five million for the first time since 1851. Population projections for the State up to 2046, anticipate a population of approximately five million under the most pessimistic scenario and over 6.7 million under the most optimistic scenario.

4.3.2 Population and Age

Table 4-1 sets out the age groups across the population in the study area (CSO, 2022).

Borris ED stands out for its notably youthful demographic, with 30.94% of residents aged 5-24, which is higher than the national average of 26.4%. The proportion of older adults (75+) is lower in Borris ED (2.45%) compared to both County Laois (5.32%) and the State (6.5%). County Laois's age distribution closely mirrors the national pattern, with a balanced mix of working-age and dependent populations. Overall, Borris ED's younger age profile suggests a strong potential workforce and a lower demand for age-related health and social services, positioning the area to benefit from employment opportunities and community infrastructure associated with new developments. In contrast, County Laois and the State have a more even spread across age groups, indicating a need for a broader range of services for both young and older residents.

Table 4-1: Age Groups in the Study Area, County Laois and the State (CSO, 2022)

Age Range	Borris ED		County Laois		State	
	No. of People	% of People	No. of People	% of People	No. of People	% of People
0-4 years	134	7.46	5,716	6.22	295,415	5.7
5-24 years	556	30.94	26,261	28.58	1,361,643	26.4
25-34 years	241	13.41	9,809	10.68	628,031	12.2
35-44 years	375	20.87	15,069	16.40	794,393	15.4
45-54 years	225	12.52	13,032	14.18	713,507	13.9
55-64 years	131	7.29	10,012	10.90	579,835	11.3
65-74 years	91	5.06	7,093	7.72	441,028	8.6
75 years and over	44	2.45	4,885	5.32	335,287	6.5
Total	1,797		91,877		5,149,139	

4.3.3 Economic Activity and Employment

The labour force is defined as the number of people above the legal working age that are available to work. Table 4-2 shows the percentage of the population who were in the labour force during the 2022 census.

Borris ED demonstrates a robust labour force, with 57.69% of residents at work, closely aligning with County Laois (55.88%) and the State (56.1%). Unemployment is higher in Borris ED (2.16% short-term, 4.33% long-term) compared to County Laois and the State. The proportion of retired individuals (8.06%) is below the national figure (16.0%). County Laois shows a healthy employment rate and moderate retirement levels, reflecting a balanced economic profile. Nationally, 56.1% are at work, with 16.0% retired and 4.6% unable to work due to disability. These figures highlight Borris ED's economic strength and low dependency, while County Laois and the State present a more typical mix of employment, retirement, and dependency rates.

The closest social welfare office to the Proposed Development is the Portlaoise Brand Office which covers the following areas: Portlaoise, The Heath, Abbeyleix, Mountrath, Stradbally, Ballinakill, Ballyfin, Ballyroan, Barnashrone, Camross, Castletown, Coolrain, Raheen, Shanahoe, Spink, Timahoe, Vicarstown and Ratheniska.

Table 4-2: Principal Economic Status (CSO, 2022)

Principle Economic Status	Borris ED		County Laois		State	
	No. of People	% of People	No. of People	% of People	No. of People	% of People
At work	773	57.69	39,934	55.88	2,320,297	56.1
Looking for first regular job	24	1.79	727	1.02	34,526	0.8
Short term unemployed	29	2.16	1,202	1.68	70,217	1.7
Long term unemployed	58	4.33	1,970	2.76	106,059	2.6
Student	151	11.27	7,703	10.78	459,275	11.1
Looking after home/family	103	7.69	5,670	7.93	272,318	6.6
Retired	108	8.06	9,705	13.58	657,790	16.0
Unable to work due to permanent sickness or disability	82	6.12	3,766	5.27	189,308	4.6
Other	12	0.90	792	1.11	27,062	0.7
Total	1,340		71,469		4,136,852	

Table 4-3 shows the industries the people in the study areas work.

Employment in Borris ED is concentrated in commerce and trade (24.45%) and professional services (21.86%). This is in line with County Laois, where professional services (24.93%) and commerce and trade (22.48%) are similarly strong. At the State level, commerce (23.8%) and professional services (24.5%) dominate with commerce and trade also strong (23.8%).

Table 4-3 Industry in which People Work in the Study Area, County Laois and the State (CSO, 2022)

Industry	Borris ED		County Laois		State	
	No. of People	% of People	No. of People	% of People	No. of People	% of People
Agriculture, forestry and fishing	22	2.85	2,303	5.77	82,228	3.5
Building and construction	43	5.56	2,791	6.99	134,482	5.8
Manufacturing industries	82	10.61	4,248	10.64	273,102	11.8
Commerce and trade	189	24.45	8,976	22.48	552,642	23.8
Transport and communications	61	7.89	2,823	7.07	212,383	9.2
Public administration	45	5.82	3,239	8.11	131,639	5.7
Professional services	169	21.86	9,957	24.93	568,105	24.5
Other	162	20.96	5,597	14.02	365,716	15.8
Total	773		39,934		2,320,297	

In relation to education, the following is observed and is outlined in Table 4-4 below.

Borris ED exhibits a strong educational profile, with 2.06% of residents having no formal education and 4.22% with primary education only both below national averages. A combined 17.38% of residents hold an honours bachelor's degree or higher, which is lower than the national average of 24.5%. County Laois aligns closer with national trends, with 19.33% holding an honours bachelor's degree or higher and 7.68% with primary education only. These patterns indicate that Borris ED is well-positioned to benefit from skilled employment opportunities, while County Laois and the State reflect a broad range of educational attainment.

Table 4-4: Highest Level of Education Completed in the Study Areas (CSO, 2022)

Highest Level of Education Completed	Borris ED		County Laois		State	
	No. of People	% of People	No. of People	% of People	No. of People	% of People
No formal education	21	2.06	1,544	2.64	81,280	2.40
Primary education	43	4.22	4,490	7.68	251,219	7.42
Lower secondary	128	12.56	8,896	15.23	446,007	13.18
Upper secondary	214	21.00	12,181	20.85	613,478	18.13
Technical or vocational qualification	110	10.79	5,067	8.67	253,892	7.50
Advanced certificate/Completed apprenticeship	77	7.56	3,937	6.74	190,268	5.62
Higher certificate	70	6.87	3,452	5.91	187,488	5.54
Ordinary bachelor degree or national diploma	82	8.05	4,310	7.38	272,535	8.05
Honours bachelor degree, professional qualification or both	109	10.70	6,588	11.28	450,523	13.31
Postgraduate diploma or degree	66	6.48	4,438	7.60	379,416	11.21
Doctorate (Ph.D) or higher	2	0.20	262	0.45	38,212	1.13
Not stated	97	9.52	3,264	5.59	220,311	6.51
Total	1,019		58,429		3,384,629	

4.3.4 Travel and Commuting

Tables 4-5, 4-6 and 4-7 detail the commuting and travel data. The following paragraphs detail the observations from the data outlined in these tables.

Commuting in Borris ED is characterised by mid morning departures, with 26.21% leaving between 08:01 - 08:30 which is above the national average of 22.5%. Nearly half (49.96%) of residents have a commute under 30 minutes, 12.98% travel more than an hour which is higher than the national average (8.7%). Car use is dominant (34.38% drivers, 25.17% passengers), while public transport use is slightly lower than the national averages, and active travel (walking/cycling) is low. County Laois shows similar trends, with high car dependency and moderate public transport use. Nationally, car use is widespread, but walking is more common compared with Borris ED and County Laois. These patterns suggest a reliance on private vehicles and long-distance commuting in Borris ED, with potential implications for stress, leisure time, and environmental impact.

Chapter 13 Traffic outlines the receiving environment in further detail with regard to traffic and transport.

Table 4-5: Time Leaving Home to Travel to Work, School or College (CSO, 2022)

Departure times	Borris ED		County Laois		State	
	No. of People	% of People	No. of People	% of People	No. of People	% of People
Before 06:30	112	9.50	5,002	8.56	212,439	6.7
06:30 - 07:00	93	7.89	5,602	9.59	312,861	9.8
07:01 - 07:30	71	6.02	5,224	8.94	299,508	9.4
07:31 - 08:00	189	16.03	10,427	17.85	564,895	17.7
08:01 - 08:30	309	26.21	13,694	23.45	716,822	22.5
08:31 - 09:00	90	7.63	8,873	15.19	479,703	15.1
09:01 - 09:30	17	1.44	1,277	2.19	89,676	2.8
After 09:30	79	6.70	2,876	4.92	184,515	5.8
Not stated	219	18.58	5,428	9.29	326,542	10.3
Total	1,179		58,403		3,186,961	

Table 4-6: Journey Time to Work, School or College (CSO, 2022)

Journey Time	Borris ED		County Laois		State	
	No. of People	% of People	No. of People	% of People	No. of People	% of People
Under 15 mins	305	25.87	18,858	32.29	936,520	29.4
1/4 hour - under 1/2 hour	284	24.09	15,271	26.15	894,844	28.1
1/2 hour - under 3/4 hour	153	12.98	8,103	13.87	550,229	17.3
3/4 hour - under 1 hour	57	4.83	2,881	4.93	186,834	5.9
1 hour - under 1 1/2 hours	97	8.23	4,695	8.04	195,397	6.1
1 1/2 hours and over	56	4.75	2,777	4.75	80,867	2.5
Not stated	227	19.25	5,818	9.96	342,270	10.7
Total	1,179		58,403		3,186,961	

Table 4-7: Means of travel to work, school, college or childcare (CSO, 2022)

Means of Travel	Borris ED		County Laois		State	
	No. of People	% of People	No. of People	% of People	No. of People	% of People
On Foot	87	6.68	5,523	8.48	456,291	12.6
Bicycle	23	1.77	798	1.22	97,212	2.7
Bus, minibus or coach	89	6.83	4,604	7.07	323,923	9.0
Train, DART or LUAS	21	1.61	1,250	1.92	85,316	2.4
Motorcycle or scooter	2	0.15	71	0.11	9,150	0.3
Car Driver	448	34.38	24,917	38.24	1,254,419	34.7
Car passenger	328	25.17	15,924	24.44	691,044	19.1
Van	54	4.14	3,682	5.65	148,823	4.1
Other (incl. lorry)	6	0.46	385	0.59	14,092	0.4
Work mainly at or from home	61	4.68	3,597	5.52	266,726	7.4
Not stated	184	14.12	4,411	6.77	266,412	7.4
Total	1,303		65,162		3,613,408	

4.3.5 Deprivation Indices

The Pobal Deprivation Index is the most commonly used tool in Ireland for assessing social and economic disparities across different areas. It assigns scores that reflect levels of advantage or disadvantage, based on data from the national census. Key indicators used in the index include employment status, age demographics, and levels of educational attainment. The Pobal HP Deprivation Indices were reviewed for the study area. The site is located within the Borris ED. The deprivation index and relevant information for the area is included in Table 4-8 below.

Table 4-8: Pobal HP Deprivation Indices

Pobal Deprivation Indices	Electoral Division
Pobal HP Index 2022	-0.67
Pobal HP Description 2022	Marginally Below Average
Population 2022	422
Age Dependency Ratio 2022	35.78%
Lone Parent Ratio 2022	15.15%
Proportion Primary Education Only 2022	7.59%
Proportion at Third Level Education 2022	36.30%
Unemployment Rate – Male	9.24
Unemployment Rate - Female	4.71

The ED in which the site is located, Borris ED, is considered to be marginally below average.

4.3.6 Human Health

Health, as defined by the World Health Organization (WHO), is *"a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity"*. The Healthy Ireland Framework 2013-2025 defines health as *'everyone achieving his or her potential to enjoy complete physical, mental and social wellbeing. Healthy people contribute to the health and quality of the society in which they live, work and play'*. This framework also states that health is much more than an absence of disease or disability, and that individual health, and the health of a country affects the quality of everyone's lived experience.

Health is an essential resource for everyday life, a public good and an asset for health and human development. A healthy population is a major asset for society and improving the health and wellbeing of the nation is a priority for Government. Healthy Ireland Framework 2013-2025 is a collective response to the challenges facing Ireland's future health and wellbeing.

Table 4-9 below outlines the general health of the population in each study area.

Table 4-9 General Health of the Population in the Study Areas (CSO, 2022)

General Health	Borris ED		County Laois		State	
	No. of People	% of People	No. of People	% of People	No. of People	% of People
Very Good	840	46.74	49,013	53.35	2,740,994	53.2
Good	559	31.11	27,955	30.43	1,527,027	29.7
Fair	151	8.40	8,103	8.82	444,895	8.6
Bad	22	1.22	1,376	1.50	72,556	1.4
Very Bad	1	0.06	290	0.32	16,843	0.3
Not Stated	224	12.47	5,140	5.59	346,824	6.7
Total	1,797		91,877		5,149,139	

Health outcomes in the study area are generally strong, with a high proportion of residents reporting “very good” or “good” health. These figures are generally in line with the national averages.

4.3.7 Social Health

According to the World Health Organisation, poor social and economic circumstances affect health throughout life. Good health involves reducing levels of educational failure, reducing insecurity and unemployment, and improving housing standards. Health is influenced, either positively or negatively, by a variety of factors. Some of these factors are genetic or biological and are relatively fixed. ‘*Social determinants of health*’ arise from the social and economic conditions in which people live. These include housing type and quality, the surrounding environment, access to healthcare and education services, income levels, and the nature of employment. All of these factors can influence a person’s health and the lifestyle choices they make.

A range of factors have been identified as social determinants of health. These can include the wider socio-economic context, inequality, poverty, social exclusion, socioeconomic position, income, public policies, health services, employment, education, housing, transport, the built environment, health behaviours or lifestyles, social and community support networks and stress.

People who are less well off or who belong to socially excluded groups tend to fare badly in relation to these social determinants. Being at work on the other hand provides not only an income, but can also provide access to social networks, a sense of identity and opportunities for development or progression.

Figure 4-3 presents the social determinants of health adapted from Dalghren and Whitehead (1991) and Grant and Barton (2006) as presented in Healthy Ireland.

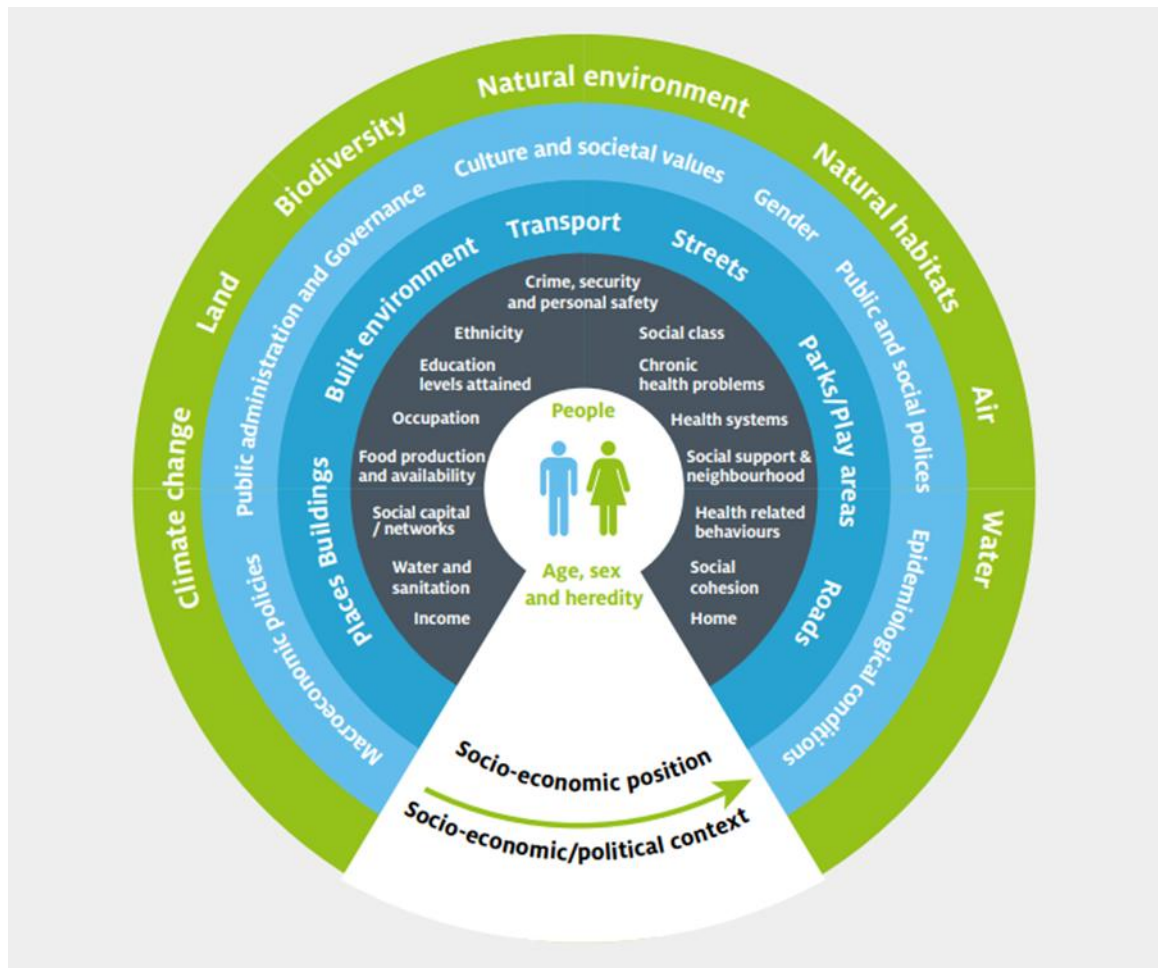


Figure 4-3: Social Determinants of Health

Section 4.3.3 of this chapter states that 54% of people in the study area are in the labour force. This reflects the high number of people of a working profile living within the area which is expected due to the percent of people of a working age living in the area.

It is proposed that the Proposed Development will operate as a small business that will create employment locally, while at the same time providing much needed raw materials to the construction sector.

4.3.8 General Amenity and Tourism

There are few amenities in close proximity to the site, of which the closest healthcare, education and community services are outlined below.

Healthcare Facilities

The closest healthcare facility to the site is The Cedar Clinic located approximately 3.19km south of the site. Portlaoise Hospital is located approximately 4.76km southeast of the site.

Education Facilities

The closest national school to the site is the Barnashrone National School located approximately 3.33km from the site, and the closest secondary school is located approximately 3.8km southeast of the site.

Sports and Recreation

Mountmellick GAA Club is the closest GAA club to the site, located approximately 3.7km northeast of the site.

Tourism and Heritage Sites

The Barkmills tourist attraction is located approximately 4.25km northwest of the site. Morett Castle is located approximately 8.26km east of the site.

4.3.9 Summary of Baseline Environment

4.3.10 Summary of Receptors and Sensitivity

The sensitivity of the local area and population was determined considering the above examination of the local area and population, and the IEMA Guide to Determining Significance for Human Health in Environmental Impact Assessment.

Table 4-10: Sensitivity Determination

Criteria	Classification	Category	Justification
Deprivation	Marginally Below Average.	Low	The deprivation index for the area whereby the site is located is described as "Marginally Below Average".
Resource Sharing	Sufficient	Low	The Proposed Development will not require a lot of resource sharing. Resource sharing will include water supply, electricity supply and road network. The site is located in a rural area that is considered to have resources to cater for both the Proposed Development and the local area. Refer to the relevant chapters for further information.
Inequalities	Narrow	Low	The local area has a majority of "very good" or "good" health which is fairly homogenous. In addition, the majority of the population is "at work" with 4.33% of the population in the study area being in long-term unemployment.
Community Outlook	Neutral	Low	The site is located in a rural setting with few sensitive receptors in close proximity.

Criteria	Classification	Category	Justification
Daily Activities	Slightly limited	Low	6.12% of the population identifies as being unable to work due to permanent sickness or disability.
Care Taking	Some care required	Low	With 6.12% of the population being unable to work due to permanent sickness or disability, it is expected that some care is required or being provided for within the study area.
Dependencies	Independent	Very Low	The age dependency ratio for the study area is 35.78% which is lower than the national average of 53.2%.
Health Status	Very good	Very Low	The majority of the population identified as having "very good" or "good" health.
Adaptability	High capacity	Very Low	The population within the study area demonstrates a high capacity for adaptability, supported by strong employment rates, high levels of educational attainment, and a predominantly working-age demographic.
Overall Sensitivity		Very Low	

4.4 Characteristics of the Proposed Development

The Proposed Development will include the importation of material to in-fill and re-contour the site. It will comprise of the importation of excavated inert soil and stone arising from local greenfield residential development sites in Portlaoise.

A detailed description of the Proposed Development is presented in Chapter 2 of this EIAR.

4.5 Potential Effect of the Proposed Development

This section provides a description of the potential direct and indirect effects that may arise in both the construction and operational phases of the Proposed Development prior to the implementation of proposed mitigation measures.

4.5.1 Construction Phase

4.5.1.1 Population demographics

The Proposed Development is not expected to have an effect on the population demographics of the area during the construction phase as the proposed development is not expected to influence or change the characteristics of the population.

4.5.1.2 Socioeconomics

The potential effect of the Proposed Development on the surrounding socioeconomics is considered to be short term and slight positive due to the purchasing of temporary construction structures.

4.5.1.3 Water Quality

During the construction phase there is potential for excavation and construction works to effect ground water and surface water quality. Surface water runoff with cementitious materials used during the construction phase, along with suspended solids or other potentially deleterious materials, could enter the underlying groundwater at the site.

The potential effect of the Proposed Development on the surrounding water quality during the construction phase is largely dust generation and the potential of sediment entering the water system during site clearing activities.

4.5.1.4 Air Quality

The greatest potential effect on air quality during this phase is from construction dust emissions and the potential for nuisance dust. Construction vehicles and machinery during the construction phase will also temporarily and intermittently generate exhaust fumes and consequently potential emissions of volatile organic compounds (VOCs), nitrogen oxides (NO_x), sulphur oxides (SO_x), and particulate matter (PM). Fine particles from these sources are recognised as a potential significant cause of pollution and can be damaging to the health of the surrounding population during the construction phase.

According to the Health Service Executive (HSE), the health effects associated with the main pollutants of concern are:

- Nitrogen Dioxide, Sulphur Dioxide, Ozone - Irritate the airways of the lungs, exacerbating symptoms in individuals suffering with respiratory conditions;
- Particulate Matter (PM₁₀, PM_{2.5}) - Can penetrate deep into the lungs, causing inflammation and worsening heart and lung diseases; and
- Carbon Monoxide - Reduces the blood's ability to carry oxygen, posing a greater risk to individuals with heart disease.

The construction phase of the Proposed Development is short-term in nature and it is not expected that the potential effects of the Proposed Development would be significant in nature.

4.5.1.5 Climate

There is potential for the release of various greenhouse gas emissions into the atmosphere during the construction phase of the Proposed Development, arising from activities such as transportation of materials, site clearance and excavation. As outlined in Chapter 9 of this EIAR, climate change effects can potentially exacerbate health issues such as heat stress, respiratory conditions, and vector-borne diseases.

Chapter 9 outlines the mitigation and monitoring measures proposed to minimise emissions and associated climate-related effects.

4.5.1.6 Noise and Vibration

Construction noise and vibration may cause temporary disturbance to nearby receptors, particularly during site clearance and heavy machinery use. However, given the number of sensitive receptors in the vicinity and the short duration of works, these effects are expected to be minor and manageable through standard mitigation (e.g. restricted working hours, noise

barriers if needed). The potential effects of noise and vibration are outlined further within Chapter 10 Noise and Vibration.

4.5.1.7 Traffic and Transport

During the construction phase there will be an increase in the number of vehicles going to and from the site which has the potential to cause congestion on the local road network causing nuisance to road users.

Chapter 12 Traffic and Transport, of this EIAR has assessed the baseline road network and construction trip generations have been calculated. The Outline Construction Environmental Management Plan (OCEMP) (Lenztech, 2023), carried out by Lenztech Surveying & Engineering Ltd. on behalf of BM Lynch Construction & Civils submitted with the planning application under a separate cover, details a series of traffic control measures to ensure any potential effects on the adjacent local and strategic road network are minimised during the construction phase.

4.5.1.8 Landscape and Visual Amenities

The landscape and visual amenity of an area can affect the emotional and physiological health of those within it. During the construction phase, the site landscape will undergo a change which will have a visual effect. This will potentially impact on the visual amenity of the nearby visual receptors.

During the construction phase, general construction, disturbance and site development has the potential to result in temporary and short-term negative landscape and visual impact on the surrounding areas. These landscape effects will reduce rapidly with distance from the site boundaries. The potential effects of Landscape and Visual Amenities are outlined further within Chapter 11 Landscape and Visual Assessment.

4.5.1.9 Human Health

The potential effects on human health during the construction phase are largely associated with the above topics of air quality, noise and vibration and water quality. These effects are assessed within the associated EIAR chapters and appropriate mitigation measures have been outlined where required. The oCEMP (Lenztech, 2023) has also been prepared which outlines effective measures to protect the environment during the construction phase.

4.5.2 Operational Phase

4.5.2.1 Population demographics

It is expected that there will be limited employment at the Proposed Development. The Proposed Development does however aim to aid residential developments in their construction by accepting soils and stone from these sites.

It is therefore considered that the potential effect of the Proposed Development on the population demographics of the area would be indirect, negligible and positive and no mitigation measures would be required for the population demographics of the area.

4.5.2.2 Socio-economic

The Proposed Development is not expected to directly affect the socio-economic conditions in the vicinity of the site. However, the Proposed Development aims to aid residential development in their construction by accepting soil and stone from these sites.

It is therefore considered that the potential effect of the Proposed Development on the population demographics of the area would be indirect, negligible and positive and therefore no mitigation measures would be required for socioeconomics.

4.5.2.3 Water Quality

The main potential effects on groundwater and surface water associated with the operational phase of the Proposed Development are impacts on groundwater flow, groundwater vulnerability, groundwater and surface water quality and water supply. Mitigation measures are outlined within Chapter 7 Hydrology and Hydrogeology.

4.5.2.4 Air Quality

The greatest potential effect on air quality during the operational phase is from dust generation during infill activities. Dust accumulation resulting from deposition of dispersed particles is commonly associated with infill activities. The primary sources of dust identified include extraction of materials, stockpiling, handling, and loading of materials, traffic movements on internal and external haul routes, stripping, and overburden storage. Dust arising from the site can reduce amenity in the local community if visible dust plumes and dust soiling are present. The coarser dust associated with these effects may be referred to as 'nuisance dust'. Smaller dust particles remain airborne for longer and have the potential to increase local ambient air concentrations of suspended particulate matter (PM₁₀ and PM_{2.5}) which can be associated with a range of health concerns (IAQM, 2016). Mitigation measures are outlined within Chapter 8 Air Quality of the EIAR.

4.5.2.5 Noise and Vibration

Noise associated with traffic movements and operational phase activities can negatively impact the population and human health of the surrounding residents. Noise sensitive receptors have been identified as primarily residential properties and have been listed in Chapter 10 of this EIAR.

The main noise sources for the operation of the Proposed Development is anticipated to be from the use of heavy machinery, including excavators, loading shovel, tipper lorries, a wheel wash and mechanical screeners. Noise is fully assessed in Chapter 10 of this EIAR.

4.5.2.6 Traffic and Transport

The Proposed Development will result in an increase of traffic volumes on local roads, however it is not expected that the number of vehicle movements will be significant. Chapter 13 Material Assets – Traffic and Transport assesses the potential effects of the Proposed Development on the surrounding traffic scenario.

4.5.2.7 Landscape and Visual Amenities

The Proposed Development will change the view of this site when viewed by the surrounding residents, however the Proposed Development has appropriately considered the existing environment as discussed in Chapter 11 Landscape and Visual.

4.5.2.8 Human Health

The potential effects on human health during the operational phase are largely associated with the above topics of air quality, noise and vibration and water quality. These effects are assessed within the associated EIAR chapters and appropriate mitigation measures have been outlined where required.

4.5.3 Potential Cumulative Impacts

The list of cumulative schemes considered has been detailed in Chapter 2 of this EIAR. Based on a review of these schemes it is not considered that the Proposed Development will act in combination or cumulatively with any existing or approved projects in the surrounding area. Refer to Chapter 2 for further information.

The cumulative effects of the Proposed Development on Air Quality, Climate, Noise and Vibration, Traffic and Transport, and Water Quality are assessed within the specialist chapters of this EIAR.

4.5.4 “Do Nothing” Impact

If the Proposed Development did not proceed, the site would remain in its current state as a cut-over bog. Air quality, noise and vibrations and traffic levels would remain as they are and there would be no change.

4.6 Avoidance, Remedial & Mitigation Measures

4.6.1 Construction Phase

No specific mitigation measures are required during the construction phase of the Proposed Development in relation to population and human health, given the lack of direct effects resulting from the Proposed Development. However, where required, mitigation measures in relation to water quality, air quality, climate, noise and vibration, traffic and landscape and visual are identified in their respective chapters in this EIAR.

4.6.2 Operational Phase

No specific mitigation measures are required during the operational phase of the Proposed Development in relation to population and human health, given the lack of direct effects resulting from the Proposed Development. However, where required, mitigation measures in relation to water quality, air quality, climate, noise and vibration, traffic and landscape and visual are identified in their respective chapters in this EIAR.

4.6.3 “Worst Case” Scenario

A worst-case scenario could occur in the event that mitigation measures fail to minimise and / or prevent potential adverse effects. Although there are no specific mitigation measures relating to population and human health, the following possibilities may occur where mitigation measures fail in relation to air quality, noise and traffic.

- An increase in the production of dust that can be carried throughout the site and create adverse effects on the neighbouring environment.
- An increase in noise caused during the operational phase can cause a disturbance any residential dwellings in close proximity to the site.
- An increase of traffic within the surrounding roads and junctions of the site.

However, it is imperative that such mitigation measures are implemented to ensure that the worst-case scenario does not occur. When considering the mitigation measures that will be in place, the event of a worst-case scenario is deemed to be unlikely.

4.7 Residual Impacts

Residual Impacts are defined as *'effects that are predicted to remain after all assessments and mitigation measures.'* No negative residual impacts in the context of population and human health are anticipated regarding this Proposed Development.

Table 4-11: Residual Effects

Activity	Receptor	Potential Effect	Quality	Significance	Duration	Type	Mitigation Measures	Residual Effect
Construction Phase								
Water Quality	Groundwater	Contamination	Negative	Negligible	Temporary	Indirect	Mitigation measures outlined in Chapter 7	Imperceptible
Air Quality	Sensitive receptors within proximity of the site	Air Emissions	Negative	Negligible	Temporary	Direct	Mitigation Measures outlined in Chapter 8	Imperceptible
Climate	Climate	Greenhouse Gas Emissions	Negative	Negligible	Temporary	Indirect	Mitigation Measures outlined in Chapter 9	Imperceptible
Noise and Vibrations	Sensitive receptors within proximity of the site	Increased noise levels	Negative	Low	Temporary	Direct	Mitigation measures outlined in Chapter 10	Slight
Traffic and Transport	Road users within proximity of the site	Increased traffic numbers	Negative	Low	Temporary	Direct	Mitigation measures outlined in Chapter 13	Slight
Landscape and Visual	Sensitive receptors within proximity of the site	Typical construction landscape	Negative	Low	Temporary	Direct	Mitigation measures outlined in Chapter 11	Slight
Operational Phase								
Water Quality	Groundwater	Contamination	Negative	Negligible	Short-term	Indirect	Mitigation measures outlined in Chapter 7	Imperceptible
Air Quality	Sensitive receptors within proximity of the site	Air Emissions	Negative	Negligible	Short-term	Direct	Mitigation Measures outlined in Chapter 8	Imperceptible
Climate	Climate	Greenhouse Gas Emissions	Negative	Negligible	Short-term	Indirect	Mitigation Measures outlined in Chapter 9	Imperceptible
Noise and Vibrations	Sensitive receptors within proximity of the site	Increased noise levels	Negative	Low	Short-term	Direct	Mitigation measures outlined in Chapter 10	Slight

Activity	Receptor	Potential Effect	Quality	Significance	Duration	Type	Mitigation Measures	Residual Effect
Traffic and transport	Road users within proximity of the site	Increased traffic numbers	Negative	Low	Short-term	Direct	Mitigation measures outlined in Chapter 13	Slight
Landscape and Visual	Sensitive receptors within proximity of the site	Typical construction landscape	Negative	Low	Short-term	Direct	Mitigation measures outlined in Chapter 11	Slight

4.8 Monitoring

4.8.1 Construction Phase

No specific monitoring measures are required during the construction phase of the Proposed Development in relation to population and human health. However, where required, mitigation measures in relation to water quality, air quality, climate, noise and vibration, traffic and landscape and visual are identified in their respective chapters in this EIAR.

4.8.2 Operational Phase

No specific monitoring measures are required during the operational phase of the Proposed Development in relation to population and human health. However, where required, mitigation measures in relation to water quality, air quality, climate, noise and vibration, traffic and landscape and visual are identified in their respective chapters in this EIAR.

4.9 Interactions

Hydrology and Hydrogeology

Interactions between water and population and human health have been considered. The Proposed Development has the potential to cause health issues as a result of impacts on local water. However, the mitigation measures outlined in Chapter 7 outlines that Proposed Development will not result in significant effects on water which therefore will not have a significant effect on the local population.

Air Quality

Interactions between air quality and population and human health have been considered. The Proposed Development has the potential to cause health issues as a result of impacts on air quality. However, the mitigation measures outlined in Chapter 8 Air Quality outlines that Proposed Development will ensure that all impacts are compliant with ambient air quality standards and human health will not be affected.

Noise and Vibrations

Interactions between noise and population and human health have been considered. The Proposed Development has the potential to cause health issues as a result of noise and vibrations. However, the mitigation measures outlined in Chapter 10 Noise and Vibration outlines that Proposed Development will not result in significant effects which therefore will not have a significant effect on the local population.

Landscape and Visual

Interactions between landscape and visual, and human health have been considered. The Proposed Development has the potential to cause nuisance to the local population. However, the mitigation measures outlined in Chapter 11 Landscape and Visual outlines that Proposed Development will not result in significant effects which therefore will not have a significant effect on the local population.

Traffic

Interactions between transport and human health have been considered. The Proposed Development has the potential to cause a nuisance to the local population. However, the mitigation measures outlined in Chapter 14: Material Assets: Traffic and Transport outlines that Proposed Development will not result in significant effects which therefore will not have a significant effect on the local population.

4.10 Difficulties Encountered When Compiling

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

4.11 Conclusion

Overall, taking into consideration the baseline population and the sensitivity of the receiving environment, coupled with the predicted residual effects after mitigation measures are implemented, it is considered that the Proposed Development will not have a significant residual effect on the population and human health in the area.

4.12 References

EIA Guide to Effective Scoping of Human Health, IEMA (2022);

EIA Guide to Determining Significance for Human Health, IEMA (2022);

Guidelines on the information to be contained in Environmental Impact Assessment Reports, EPA (2022);

Healthy Ireland Framework 2013-2025

Institute of Public Health (IPH) (2021) Health Impact Assessment Guidance.

Laois County Development Plan 2021 – 2027;

Ordinance Survey Ireland (OSI)

The Central Statistics Office (CSO) 2022

WHO. Ottawa Charter for Health Promotion First International Conference on Health Promotion Ottawa, 21 November 1986 - WHO/HPR/HEP/95.1. 1986.

WHO. Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June, 1946; signed on 22 July 1946 by the representatives of 61 States (Official Records of the World Health Organization, no. 2, p. 100) and entered into force on 7 April 1948. 1946.

5 BIODIVERSITY

5.1 Introduction

This Chapter assesses the potential effects of the Proposed Development on habitats and species; particularly those protected by national and international legislation or considered to be of particular nature conservation importance on or adjacent to the Site. This chapter will describe the ecology of the Site, with emphasis on habitats, flora and fauna, and will assess the potential effects of the Construction and Operational Phases of the Proposed Development on these ecological receptors. The chapter follows Guidelines for Ecological Impact Assessment in the UK and Ireland, by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018) and supplemented by the National Roads Authority (2009) guidelines for Assessment of Ecological Impacts of National Road Schemes. The purpose of this Chapter is to:

- Set out the methodologies used to inform the assessment.
- Identify Key Ecological Receptors (KERs) within the Zone of Influence (ZOI).
- Assess the impacts from the Proposed Development on the KERs and the resulting significant effects.
- Set out measures to avoid or mitigate negative impacts.
- Assess the residual effects after the incorporation of agreed avoidance or mitigation measures to ensure legal compliance.
- Set out agreed measures to offset significant residual effects.
- Set out opportunities for ecological enhancement.

5.1.1 Quality Assurance and Competency of Experts

All surveying and reporting have been carried out by qualified and experienced ecologists and environmental consultants TR and BS.

TR has a B.Sc. in Environmental and Natural Resource Management (Hons) and a Post-Graduate Diploma in Environmental Management with GIS. TR is an experienced Ecologist who has specialised in ornithology and terrestrial mammals with over 8 years' experience in ecological consultancy along with a lifetime of personal interest and experience in wildlife management. TR has extensive field experience with further experience and competencies in desktop research, preparing AA Screening Reports (AA), Ecological Impact Assessment Reports (EclAs), Bird Activity Reports and detailed Species-Specific Maps. His ability to deal with and understand a range of species, survey methods and habitats is excellent, having an in-depth knowledge and understanding of EU and Irish legislation.

BS is an Ecologist with DNV and has both a BSc (Hons) in Ecological and Environmental Sciences, and an MSc in Carbon Management from the University of Edinburgh. BS has experience in environmental and ecological data collection, field surveys and report writing and has previously undertaken projects in natural flood management and invasive species mapping. BS has experience specifically in undertaking ecology notes, AA Screening Reports,

Natura Impact Statements (NISs) and has supported in various ecological project management roles.

5.2 Study Methodology

This Chapter has been undertaken to support and assess the Proposed Development planning application and assesses the potential impacts that the Proposed Development may have on the ecology of the Site and its environs. Where potential for a risk to the environment is identified, mitigation measures are proposed on the basis that by deploying these mitigation measures the risk is eliminated or reduced to an insignificant level.

This section details the steps and methodology employed to undertake an ecological impact assessment of the Proposed Development.

5.3 Scope of Assessment

The specific objectives of the study were to:

- Undertake baseline ecological surveys and evaluate the nature conservation importance of the Site;
- Identify and assess the direct, indirect and cumulative ecological implications or impacts of the Proposed Development during its lifetime; and
- Where possible, propose mitigation measures to remove or reduce those impacts at the appropriate stage of the development.

5.4 Desk Study

A desktop study was carried out to collate and review available information, datasets and documentation sources pertaining to the Site's natural environment. The desk study, completed in December 2025, relied on the following sources:

- Information on species records¹ and distributions, obtained from the National Biodiversity Data Centre (NBDC) at maps.biodiversityireland.ie;
- Information on Floral Protection Order (FPO) Bryophytes database at dahg.maps.arcgis.com;
- Information on waterbodies, catchment areas and hydrological connections obtained from the Environmental Protection Agency (EPA) at gis.epa.ie;
- Information on bedrock, groundwater, aquifers and their statuses, obtained from Geological Survey Ireland (GSI) at www.gsi.ie;

¹ The Site of the Proposed Development lies within the 10km grid square O03, the 2km grid squares O03F, O03A, and O03G, and the 1km grid squares O0232, O0231, and O0131. Records from the last 20 years from available datasets are given in the relevant sections of this report.

- Information on the network designated conservation sites, site boundaries, qualifying interests and conservation objectives, obtained from the National Parks and Wildlife Service (NPWS) at www.npws.ie;
- Satellite imagery and mapping obtained from various sources and dates including Google, Digital Globe, Bing and Ordnance Survey Ireland;
- Information on the existence of permitted development, or developments awaiting decision, in the vicinity of the Proposed Development from the National Planning Application Database available at: <https://housinggov.ie/maps.arcgis.com/apps/webappviewer/index.html?id=9cf2a09799d74d8e9316a3d3a4d3a8de>; and
- Information on the extent, nature and location of the Proposed Development, provided by the applicant and/or their design team.

A comprehensive list of all the specific documents and information sources consulted in the completion of this report is provided in 5.20.

5.5 Zone of Influence

The ZOI for a project is the area over which ecological features may be affected by changes as a result of the Proposed Development and associated activities. This is likely to extend beyond the development site, for example where there are ecological or hydrological links beyond the site boundaries (CIEEM, 2018). The ZOI will vary with different ecological features, depending on their sensitivities to an environmental change.

Furthermore, ZOI in relation to European sites is described as follows in the ‘OPR Practice Note PN01 - Appropriate Assessment Screening for Development Management’ (OPR, 2021):

“The zone of influence of a proposed development is the geographical area over which it could affect the receiving environment in a way that could have significant effects on the Qualifying Interests of a European site. This should be established on a case-by-case basis using the Source-Pathway-Receptor framework and not by arbitrary distances (such as 15 km).”

5.6 Identification of Relevant Designated Sites

To determine the ZOI of the Proposed Development for designated sites, reference was made to the OPR Practice Note PN01 - Appropriate Assessment Screening for Development Management’ (OPR, 2021), a practice note produced by the Office of the Planning Regulator, Dublin. This note was published to provide guidance on screening for AA during the planning process, and although it focuses on the approach a planning authority should take in screening for AA, the methodology is also readily applied in the preparation of EclA reports such as this to identify all relevant designated sites potentially linked to the Proposed Development.

As noted above, the most recent guidance advises against the use of arbitrary distances that serve as precautionary ZOI (e.g., 15km), and instead recommends the application of the Source-Pathway-Receptor (S-P-R) model in the identification of designated sites, stating that *“This should avoid lengthy descriptions of European sites, regardless of whether they are*

relevant to the proposed development, and a lack of focus on the relevant European sites and issues of importance". Although this statement refers to European sites, it is also applicable to other designated sites.

Thus, the methodology used to identify relevant designated sites comprised the following:

- Identification of potential sources of effects based on the Proposed Development description and details;
- Identification of potential pathways between the Site of the Proposed Development and any designated sites within the ZOI of any of the identified sources of effects.
 - Water catchment data from the EPA (www.epa.ie) were used to establish or discount potential hydrological connectivity between the Proposed Development and any designated sites.
 - Groundwater and bedrock information used to establish or discount potential hydrogeological connectivity between the Proposed Development and any designated sites.
 - Air and land connectivity assessed based on Proposed Development details and proximity to designated sites.
 - Consideration of potential indirect pathways, e.g., impacts to flight paths, *ex-situ* habitats, etc.
- Review of Ireland's designated sites to identify those sites which could potentially be affected by the Proposed Development in view of the identified pathways, using the following sources;
 - European sites and nationally designated sites (e.g., NHAs and pNHAs) from the NPWS (www.npws.ie);
 - Ramsar sites from the Irish Ramsar Wetland Committee (<https://irishwetlands.ie/irish-sites/>);
 - Other internationally designated sites e.g., UNESCO Biosphere's; and
- Regional development plans to identify any remaining sites or areas designated for nature conservation at a local level.

5.7 Field Surveys

5.7.1 Habitat Surveys

Three walkover surveys were conducted at the Site, including a Preliminary Ecological Appraisal (PEA) walkover survey on 9th December 2025, a detailed habitat survey conducted on the 26th January 2026 and a walkover survey on 6th March 2026. Habitats were categorised according to the Heritage Council's 'A Guide to Habitats in Ireland' (Fossitt, 2000) to level 3. The habitat mapping exercise had regard to the 'Best Practice Guidance for Habitat Survey and Mapping' (Smith *et al.*, 2010) published by the Heritage Council. Any incidental observations or evidence of rare and/or protected flora were recorded.

In addition, the Site was searched for invasive flora with a particular focus on those listed on the Third Schedule of SI No. 477/2011, and their location and extent recorded.

5.7.2 Bat surveys

5.7.2.1 Preliminary Bat Roost Assessment (PBRA)

A PBRA of Potential Roost Features (PRFs) within trees on or close to the Site was completed on 9th December 2025 and 6th March 2026 in adherence to best practice guidelines (Collins, 2016 and Marnell et al., 2022). This was undertaken to determine the suitability of the Site for roosting bats and the potential requirement for further surveys to be undertaken. PRFs can be defined in four broad terms of suitability as detailed below:

- Negligible – No suitable features observed;
- Low – A tree of sufficient size to contain roost features but none observed from the ground;
- Moderate – A structure or tree with one or more roost features and able to support one or more bats but unlikely to support a roost of high conservation status.
- High - A structure or tree with one or more roost features that are obviously suitable for use by a larger number of bats on a regular basis, and potentially for longer periods of time.

5.7.2.2 Preliminary Bat Habitat Suitability Assessment

A Bat Habitat Suitability Assessment was carried out in conjunction with the roost assessment on 9th December 2025 and 6th March 2026. This assessment evaluated the habitats present on Site and in the wider area for bat foraging and commuting suitability. Habitat suitability is assessed qualitatively from Negligible to High:

- Negligible – No suitable foraging or commuting habitats on Site
- Low – Suitable but isolated habitats that could be used by small numbers of commuting and/or foraging bats, such as poorly connected gappy hedgerows, lone trees, unvegetated streams, etc.
- Moderate – Suitable continuous habitat connected to the wider landscape that could be used by commuting and/or foraging bats, such as treelines, scrub, grassland, water, etc.
- High – Continuous high-quality habitat that is well-connected to the wider landscape, and is likely used regularly by commuting and/or foraging bats, such as river valleys, broadleaved woodland, woodland edge, grazed parkland, etc.

5.7.2.3 Bat Landscape Suitability

The Bat Conservation Ireland Landscape Suitability Model (Lundy *et al.*, 2011) provides a habitat suitability index for bat species across Ireland. The model divides the country into 1 km grid squares and ranks the habitat within the squares according to its suitability for various bat species. The scores are divided into five qualitative categories of suitability, namely:

- 0.0000000 - 13.000000: Low
- 13.000001 - 21.333300: Low – Medium
- 21.333301 - 28.111099: Medium
- 28.111100 - 36.444401: Medium – High
- 36.444402 - 58.555599: High

5.7.3 Bird Surveys

The survey methodology employed was based on that recommended in standard literature used by for example the British Trust for Ornithology (BTO) (Gillings et al, 2007; Bibby et al, 1992 and Gilbert et al, 1998), which has subsequently been adapted into guidelines for ecological consultants by the Bird Survey & Assessment Steering Group (2022). During the surveys, the Site was walked slowly, approaching all habitat within and adjacent to the Proposed Development and scanning and listening for birds. The locations of birds seen and heard were mapped using standard BTO codes and activity symbols.

5.7.3.1 Scoping Bird Surveys

Bird scoping surveys were conducted on both the 9th December 2025, 26th January 2026 and 6th March 2026. The surveys were carried out in suitable weather conditions and within daylight hours. All species encountered during the surveys and location of any visible nest sites were recorded in field notes.

5.7.4 Badger Survey

A systematic search for signs of badgers (*Meles meles*) was conducted on the 9th December 2025, 26th January 2026 and 6th March 2026. Furthermore, any incidental observations of evidence for badgers were recorded whenever on Site. The surveys followed standard guidelines (Harris, Cresswell & Jeffries, 1989 and NRA, 2005) and included a thorough search for setts or for signs of badger activity, including tracks, latrines, hairs and snuffle holes.

5.7.5 Otter Survey

All watercourses within 150m of the Site were assessed for the presence of otter (*Lutra lutra*) and for the suitability to support otters on both the 9th December 2025, 26th January 2026 and 6th March 2026. This involved searching for associated field signs, such as spraints, footprints, anal jelly, holts and couches to best practice guidelines (NRA, 2008).

5.7.6 Amphibians

Amphibian field surveys were undertaken accordance with best practice guidelines (NRA, 2009a). All waterbodies within 250m of the Site of the Proposed Development were assessed for the presence of amphibians.

5.7.7 Other Fauna

General fauna surveys of the Site were carried out in conjunction with the other field surveys on 9th December 2025, 26th January 2026 and 6th March 2026. The habitat types recorded throughout the survey area were used to assist in identifying the fauna considered likely to utilise the area. Furthermore, the Site was searched for tracks and signs of mammals as per

Bang and Dahlstrom (2001) and the National Road Authority (NRA, 2005). This survey considers protected or notable fauna that may occur within the Site or in the adjacent lands, but for which no historical records from the relevant grid square(s) exist or no targeted surveys were carried out.

5.8 Ecological Assessment

This Chapter has been undertaken following the methodology set out in Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018); and with reference to the National Roads Authority 'Guidelines for Assessment of Ecological Impacts of National Road Schemes' (NRA, 2009) and the Environmental Protection Agency (EPA) 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' (EPA, 2022) and BS 42020:2013 Biodiversity: Code of practice for planning and development (BSI, 2013).

The evaluation of significant effects should be based on available scientific evidence. Based on the precautionary principle, if the available information is not sufficient, then a significant effect may be assumed likely to occur.

5.8.1 Evaluation of Ecological Features

The value of the ecological features, i.e., the habitats and species present or potentially present, was determined using the ecological evaluation at different geographical scales (NRA, 2009), presented in Appendix 5-2. This evaluation scheme, with values ranging from locally important to internationally important, seeks to provide value ratings for habitats and species present that are considered ecological receptors of impacts that may ensue from a proposal. Based on best practice (CIEEM, 2018), any features considered to be less than of local value are not assessed within this Chapter.

5.8.2 Impact Assessment

As per the NRA guidelines, impact assessment is only undertaken of Key Ecological Receptors (KERs). The assessment of the potential impact of the Proposed Development on the identified KERs was carried out with regard to the criteria outlined in the EPA Guidelines (EPA, 2022), presented in Appendix 5-3. These guidelines set out a number of parameters that should be considered when determining which elements of the Proposed Development could constitute impacts or sources of impacts. These include;

- Positive, neutral or negative effect;
- Significance;
- Extent;
- Probability;
- Duration;
- Timing;
- Frequency; and

- Reversibility.

The impact assessment process considers both direct and indirect impacts: direct ecological impacts are changes that are directly attributable to a defined action, e.g. the physical loss of habitat. Indirect ecological impacts are attributable to an action, but which affect ecological resources through effects on an intermediary ecosystem, process, or feature, e.g., the creation of roads which cause hydrological changes, which, in the absence of mitigation, could lead to an adverse effect of a sensitive habitat.

5.8.3 Assessment of Cumulative Impacts and Effects

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. Cumulative effects can occur where a Proposed Development results in individually insignificant impacts that, when considered in combination with impacts of other proposed or permitted plans and projects, can result in significant effects.

Relevant plans and policies were reviewed to identify any potential for negative cumulative impacts with the Proposed Development. Additionally, existing planning permissions from the past five years (from 2018 onwards) within the ZOI of the Proposed Development were reviewed, with particular focus on potential cumulative impacts on the identified KERs. Long-term developments were also considered where applicable.

5.8.4 Avoidance, Mitigation, Compensation and Enhancement Measures

Where potentially significant effects have been identified, the mitigation hierarchy has been applied, as recommended in the CIEEM Guidelines. The mitigation hierarchy sets out a sequential approach beginning with the avoidance of impacts where possible, the application of mitigation measures to minimise unavoidable impacts and then compensation for any remaining impacts. Once avoidance and mitigation measures have been applied residual effects are then identified along with any necessary compensation measures, and incorporation of opportunities for enhancement. When seeking mitigation or compensation solutions, efforts should be consistent with the geographical scale at which an effect is significant. For example, mitigation and compensation for effects on a species population significant at a county scale should ensure no net loss of the population at a county scale. The relative geographical scale at which the effect is significant will have a bearing on the required outcome which must be achieved.

It is important for the Chapter to clearly differentiate between avoidance, mitigation, compensation and enhancement and these terms are defined here as follows:

- Avoidance is used where an impact has been avoided, e.g., through changes in scheme design. In practice, avoidance measures are typically implemented during the design stage via discussions and re-design (e.g., avoiding a sensitive habitat by relocating a building). Avoidance measures are therefore rarely reported within a Biodiversity Chapter, which focuses on assessing the final design.
- Mitigation is used to refer to measures to reduce or remedy a specific negative impact in situ.

- Compensation describes measures taken to offset residual effects, i.e. where mitigation in situ is not possible.
- Enhancement is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures, although they can be complementary.

5.9 Limitations

Every effort has been made to provide a comprehensive description of the site; however, the following specific limitations apply to this assessment:

- An extensive search of available datasets for records of rare and protected species within proximity of the Proposed Development has been undertaken as part of this assessment. However, the records from these datasets do not constitute a complete species list. The absence of species from these datasets does not necessarily confirm an absence of species in the area.
- No species-specific surveys for receptors have been undertaken. This includes breeding bat activity surveys, breeding bird surveys, winter bird surveys, targeted mammal surveys, amphibian surveys or marsh fritillary surveys. This has been addressed throughout the report through use of the precautionary principle and subsequent commitment to pre-commencement surveys as per best practice protocol for each species.

5.10 Existing and Receiving Environment

This section sets out the baseline conditions for the ecological features within the Site using the findings of the desk study and field surveys.

5.10.1 Geology, Hydrogeology and Hydrology

The Site of the Proposed Development is within the Barrow Catchment (Catchment Code: 14) and the Barrow_SC_020 Sub-catchment (Sub-catchment Code: 14_11).

The Kyleclonhobert Stream (WFD Name: Triogue_030, EU Code: IE_SE_14T010300) is the closest waterbody to the Site and begins approximately 0.22km south of the Site. This is recognised as a tributary of the Triogue River (EPA Code: Triogue_030, EU Code: IE_SE_14T010300) by the WFD and flows in a southeasterly direction for approximately 980m before joining the larger Triogue River. The Triogue River (Triogue_030) flows a further 2.6km (river length) in a northeasterly direction before discharging into the Triogue River (WFD Name: Triogue_040, EU Code: IE_SE_14T010400), which flows a further 3.9km (river length) also in a northeasterly direction before joining the River Barrow (EPA Code: BARROW_050, EU Code: IE_SE_14B010550). During the most recent survey period of 2019-2024, the Triogue River was classified as 'At Risk' of not meeting its Water Framework Directive (WFD) objectives and was assigned a 'Poor' ecological status. The Barrow River is also classified as 'At Risk' of not meeting its Water Framework Directive (WFD) objectives and was assigned a 'Moderate' ecological status (EPA, 2025).

The Clonreher Stream (WFD Name: Kylegrove Stream_010, EU Code: IE_SE_14K060600), which is located approximately 1km south of the site at its closest point, is a tributary of the

Kylegrove Stream (WFD Name: Kylegrove Stream_010, EU Code: IE_SE_14K060600), which flows in a easterly direction before converging into the Triogue River (WFD Name: Triogue_030, EU Code: IE_SE_14T010300) approximately 1km southeast of the site at its closest point.

The next closest waterbody to the Site is the Clonsoghey Stream (WFD Name: Blackwater (Laois)_010, EU Code: IE_SE_14B031000) which is approximately 1.2km to the northwest. This is recognised by the WFD as a tributary to the Blackwater (Laois) Stream (EPA Code: BLACKWATER (LAOIS)_010, EU Code: IE_SE_14B031000) and flows in a north-westerly direction for 750m before joining the larger Blackwater (Laois) River. The Blackwater (Laois) River (WFD Name: Blackwater (Laois)_010, EU Code: IE_SE_14B031000) is located approximately 1.3km northwest of the site at its closest point and flows in a northerly direction before discharging into the Owenass River (WFD Name: Owenass_020, EU Code: IE_SE_14O010300) approximately 3.6km northwest of the site, which in turn discharges into the River Barrow (EPA Code: Barrow_040, EU Code: IE_SE_14B010550) approximately 6.4km north of the site at its closes point. During the most recent survey period of 2019-2024, the Blackwater River was classified as 'Not at Risk' of not meeting its Water Framework Directive (WFD) objectives and was assigned a 'Good' ecological status (EPA, 2025).

The Site is situated on the Portlaoise groundwater body (EU Code: IE_SE_G_107) which is 'Not at Risk' of not meeting its WFD objectives and was assigned 'Good' ecological status. The aquifer type within the Site boundary is a *Locally Important Aquifer* (LI) on bedrock which is *Moderately Productive only in Local Zones*. The groundwater rock units underlying the aquifer are classified as *Dinantian Lower Impure Limestones* (GSI, 2025). The level of vulnerability of the Site to groundwater contamination via human activities is primarily *Moderate* across the entirety of the Site.

The majority of the soil on Site is classified as cutover peat of poor drainage, with a small section in the east is poorly drained mineral (mainly basic) soil (IFS Soil Code: BminPD). The bedrock beneath the site is mapped by the GSI (GSI, 2026) as the Ballysteen Formation (Code: CDBALL), described as dark muddy limestone and shale.

The waterbody status for river groundwater and transitional waterbodies relevant to the Site as recorded by the EPA (2025) in accordance with European Communities (Water Policy) Regulations 2003 (as amended) (SI no: 722/2003) are provided in Table 5-1.

Table 5-1: Waterbodies relevant to the location of the Proposed Development Site

Waterbody Name	Water body; EU code	Location from Site (km)	Distance from Site (km)	WFD water body status (2016-2021)	WFD 3rd cycle Risk Status	Hydraulic Connection to the Site
Surface Water Bodies						
Kyleclonhobert Stream	IE_SE_14T010300	South	0.2	Poor	At Risk	Potential hydrological or hydrogeological connection via surface water or groundwater flow

Clonsoghey Stream	IE_SE_14B031000	Northwest	1.2	Moderate	Not at Risk	Potential hydrogeological connection
Clonreher / Kylegrove Stream	IE_SE_14K060600	Southeast	1	Poor	Review	Potential hydrogeological connection
Triogue_030	IE_SE_14T010300	Southeast	0.2	Poor	At Risk	Potential hydrological or hydrogeological connection via surface water (i.e. drainage ditches) or groundwater flow
Triogue River_040	IE_SE_14T010400	Northeast	2.2	Poor	At Risk	Potential hydrological via Triogue 030
River Barrow_050	IE_SE_14B010550	Northeast	9.7	Moderate	At Risk	Potential hydrological or hydrogeological connection via surface water or groundwater flow
Blackwater (Laoise)	IE_SE_14B031000	Northwest	1.2	Good	Not at Risk	Potential hydrogeological connection via groundwater flow
Transitional Water Bodies						
NA	NA	NA	NA	NA	NA	NA
Groundwater Bodies						
Portlaoise Groundwater Body	IE_SE_G_107	NA	NA	Good	Not at Risk	Underlying groundwater-body

5.10.2 European Sites

All European sites potentially linked to the Proposed Development have been identified and fully assessed in the AA Screening Report (Stage 1 AA) accompanying this submission under separate cover. A summary of the AA conclusion is given below.

The potential likely significant effects of this development (to use the terminology of the Habitats Directive) are minimal and it cannot be said that this development will have a significant impact on the European site downstream or on the integrity of the Natura 2000 network. It will also not compromise the attainment of the conservation objectives for any site, in particular the River Barrow & River Nore SAC. This finding is based on the best scientific information available. This holds for the project by itself or in combination with other projects in the vicinity and there is no necessity for a Stage 2 assessment (NIS).

Otter have been identified as utilising the drainage ditches adjoining the Site during the 2026 surveys, which have been undertaken since the writing of the Appropriate Assessment. Given that the Site is approximately 10 river km from the River Barrow and River Nore SAC (002162) for which Otter are listed as a qualifying interest, and that the known range of otter can be 13-

20km for males (Reid et al,2025),the new potential indirect pathway due to QI species disturbance and ex-situ habitat loss on the River Barrow and River Nore SAC will be discussed further within this chapter.

5.10.3 Other Designated Sites

Potential impact pathways are discussed in the following sections in the context of the Proposed Development.

5.10.3.1 Direct Pathways

5.10.3.1.1 Hydrological Pathways

The closest designated site to the Proposed Development is the Clonreher Bog NHA (002357) which lies approximately 400m west of the Site. Although this distance is not insignificant, all drainage channels within the Site run north to south, with the Clonreher bog located at a higher elevation in relation to the Site. This, coupled with the fact that the NHA is separated from the Site by a vegetative buffer, as well as a road, will prevent surface water flows from reaching the Site. As such, the hydrological pathway to this site can be ruled out.

All other designated sites, including pNHAs and Ramsar Sites (Table 5-2) are located at a further distance from the Site than the above, and are not connected hydrologically by any watercourse. As such, no other designated Sites are linked to the Site via hydrological means.

5.10.3.1.2 Hydrogeological Pathways

As discussed within Section 5.10.1, the closest designated site to the Proposed Development, Clonreher Bog NHA, is at a higher elevation than the Site. As such, groundwater flows north to south as opposed to towards this NHA. As such, the hydrological pathway to this site can be ruled out.

The next closest designated site travelling along this southerly gradient is Ridge of Portlaoise (000876) which is situated 0.9km from the Site of the Proposed Development. Given that this is within the possible range of groundwater body movement, this pNHA, as well as Dunamase Wood pNHA, Rock Of Dunamase pNHA and Killeale Hill pNHA cannot be ruled out as hydrogeologically connected to the Site, and as such will be assessed as a KER.

Given that all other designated Sites within range of a possible hydrogeological pathway are situated to the south of the Site and at a further distance than the Ridge of Portlaoise, it can be concluded that no other designated Sites are linked to the Site via hydrogeological means.

5.10.3.1.3 Air and Land Pathways

The construction and operational phases of the Proposed Development could introduce physical disturbance impacts transferrable by land pathways. Given that the Site of the Proposed Infilling does not encroach onto/ overlap any designated sites, there are no impacts via land pathways envisaged.

The construction and operational phases could also introduce dust, and noise impacts transferable via air pathways, as well as increased lighting and human activity at the Site and in the vicinity of the Site during the construction and operational phases.

According to Institute of Air Quality Management (IAQM) Guidance on the Assessment of Mineral Dust Impacts for Planning (IAQM, 2016), experience of the Working Group together with published studies and anecdotal evidence on the change in both airborne concentrations

and the rate of deposition with distance, suggests that dust impacts will occur mainly within 400m of the operation, even at the dustiest of mineral sites. Adverse dust impacts from sand and gravel sites were found to be uncommon beyond 250m and beyond 400m from hard rock quarries measured from the nearest dust generating activities. IAQM (2016) note that is commonly accepted that the greatest impacts will be within 100m of a source, and this can include both large ($>30\mu\text{m}$) and small dust particles. The greatest potential for high rates of dust deposition and elevated particulate matter (PM₁₀) concentrations occurs within this 100m distance.

The closest designated site, the Clonreher Bog NHA, is approx. 400m west of the Site of the Proposed Development. Although it is unlikely that the size of the dust particles generated from the expected infill material will be small enough to travel the maximum distance of 400m such as those generated from mineral sites, a precautionary approach will be taken, and **a potential air pathway to Clonreher Bog NHA cannot be ruled out** and will be assessed further within this chapter.

Given that all other designated sites are located at a distance greater than 400m from the Site of the Proposed Development, no impacts to any other designated sites via air pathway are envisaged.

5.10.3.2 Indirect Pathways

There is a possible indirect air pathway associated with the delivery of infilling materials. Delivery vehicles importing the materials may utilise the N80 to travel to Site, which runs directly adjacent to the Clonreher Bog NHA. Given the proximity of this activity associated with the Proposed Development to the sensitive habitats of the **Clonreher Bog NHA**, **this indirect air pathway cannot be ruled out** and will be discussed further within this chapter.

Finally, an indirect land pathway to the Derries Wood pNHA (000416) has also been identified associated with possible use of the Site by Pine Marten (*Martes martes*), a protected mammal species which is identified as an inhabitant of this pNHA within the Site Synopsis. As such, **this indirect land pathway to the Derries Wood pNHA cannot be ruled out** and will be discussed further within this chapter.

No other indirect pathways to any other designated sites have been identified.

Table 5-2: Designated sites considered with the source pathway receptor (SPR) method to establish notable links between the sources of effects arising from the proposed amendments and any relevant designated sites.

Site Name & Code (Receptor)	Distance to Site of Proposed Development	Designation Rationale / Site Description	Potential Pathway to receptors
Internationally Designated Sites			
Slieve Bloom Mountains SAC (000412)	5.9	The Slieve Bloom Mountains lie on the Offaly-Laois border, starting about 8 km north-east of Roscrea and running about 24 km north-east, towards Clonaslee. The mountains are of Old Red Sandstone, flanked by Silurian rocks. The site extends from approximately 180 m to 529 m O.D. The site is a Special Area of Conservation (SAC) selected for the following habitats [4010] Wet Heath [7130] Blanket Bogs (Active)* [91E0] Alluvial Forests.	No pathways identified/ ruled out within AA screening
Slieve Bloom Mountains SPA (004160)	6.5	The Slieve Bloom Mountains SPA is situated on the border between Counties Offaly and Laois, and runs along a north-east/south-west aligned ridge for approximately 25 km. Much of the site is over 200 m in altitude, rising to a maximum height of 527 m at Arderin. The mountains are of Old Red Sandstone, flanked by Silurian rocks. Several important rivers rise within the site, including the Barrow, Delour and Silver The Slieve Bloom Mountains SPA is of ornithological importance because it provides excellent nesting and foraging habitat for breeding Hen Harrier and is one of the top sites in the country for the species. The presence of three species, Hen Harrier, Merlin and Peregrine, which are listed on Annex I of the E.U. Birds Directive is of note. The Slieve Bloom Mountains is a Ramsar Convention site and a Biogenetic Reserve. Part of the Slieve Bloom Mountains SPA is a Statutory Nature Reserve.	No pathways identified/ ruled out within AA Screening
Mountmellick SAC (002141)	6.5	This site comprises a disused stretch of the Grand Canal between Dangan's Bridge and Skeagh Bridge, approximately 3 km east of Mountmellick in Co. Laois. The site is a Special Area of Conservation (SAC) selected: [1016] Desmoulin's Whorl Snail (<i>Vertigo moulinsiana</i>) The habitat at this site is composed largely of fen-type vegetation, including Bulrush (<i>Typha latifolia</i>), Reed Sweet-grass (<i>Glyceria maxima</i>) and Yellow Iris (<i>Iris pseudacorus</i>). The area west of the bridge has been drained extensively and is now grassland.	No pathways identified/ ruled out within AA screening

River Barrow and River Nore SAC (002162)	3.6	This site consists of the freshwater stretches of the Barrow and Nore River catchments as far upstream as the Slieve Bloom Mountains, and it also includes the tidal elements and estuary as far downstream as Creadun Head in Waterford. The site passes through eight counties – Offaly, Kildare, Laois, Carlow, Kilkenny, Tipperary, Wexford and Waterford. Major towns along the edge of the site include Mountmellick, Portarlinton, Monasterevin, Stradbally, Athy, Carlow, Leighlinbridge, Graiguenamanagh, New Ross, Inistioge, Thomastown, Callan, Bennettsbridge, Kilkenny and Durrow. The larger of the many tributaries include the Lerr, Fushoge, Mountain, Aughavaud, Owenass, Boherbaun and Stradbally Rivers of the Barrow, and the Delour, Dinin, Erkina, Owveg, Munster, Arrigle and King's Rivers on the Nore. The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes): [1130] Estuaries [1140] Tidal Mudflats and Sandflats [1170] Reefs [1310] Salicornia Mud [1330] Atlantic Salt Meadows [1410] Mediterranean Salt Meadows [3260] Floating River Vegetation [4030] Dry Heath [6430] Hydrophilous Tall Herb Communities [7220] Petrifying Springs* Version date: 03.04.2024 2 of 7 002162_rev24.docx [91A0] Old Oak Woodlands [91E0] Alluvial Forests* [1016] Desmoulin's Whorl Snail (<i>Vertigo moulinsiana</i>) [1029] Freshwater Pearl Mussel (<i>Margaritifera margaritifera</i>) [1092] White-clawed Crayfish (<i>Austropotamobius pallipes</i>) [1095] Sea Lamprey (<i>Petromyzon marinus</i>) [1096] Brook Lamprey (<i>Lampetra planeri</i>) [1099] River Lamprey (<i>Lampetra fluviatilis</i>) [1103] Twaite Shad (<i>Alosa fallax</i>) [1106] Atlantic Salmon (<i>Salmo salar</i>) [1355] Otter (<i>Lutra lutra</i>) [1421] Killarney Fern (<i>Trichomanes speciosum</i>). Overall, the site is of considerable conservation significance for the occurrence of good examples of habitats and of populations of plant and animal species that are listed on Annexes I and II of the E.U. Habitats Directive. Furthermore it is of high conservation value for the populations of bird species that use it. The occurrence of several Red Data Book plant species including three rare plants in the salt meadows add further interest to this site	New potential indirect pathway due to QI species (otter) disturbance and ex-situ habitat loss Possible hydrological connection assessed and ruled out within AA for proposed development
Slieve Bloom Mountains Ramsar (335)		The Slieve Bloom Mountains Nature Reserve and Ramsar Site is home to two emblematic bird species; the hen harrier and the red grouse. Both species traditionally nest on the ground on the blanket bog and heath. While Red Grouse are still ground nesting, the early stages of new and second-rotation conifer	No pathways identified/ ruled out within AA Screening

		plantations are now the most frequently used nesting sites for Hen Harrier. The hen harrier is one of Ireland's rarest birds of prey which feeds mainly on small prey items such as meadow pipits. The red grouse is a secretive gamebird, and is usually only seen when flushed from undergrowth. The Ramsar site lies within the much more extensive Slieve Bloom Mountains Special Protection Area which has been designated due to the presence of Hen harrier (<i>Circus cyaneus</i>) and which includes large areas of forestry and rough grassland (in addition to blanket bog and wet heath habitat). The hen harrier is listed as Near Threatened within Europe (IUCN) and is listed in Annex I of the EU Birds Directive. Under the EU Birds Directive Ireland is obliged to protect and conserve Annex I species. These obligations involve Special Protection Area (SPA) designation and monitoring of hen harriers nationally, regionally and within the designated areas. The fourth national survey of hen harriers in Ireland was undertaken in 2015 and was preceded by surveys in 2010; 2005 and 1998-2000. According to Ruddock et. al. (2016) the 2015 survey of breeding hen harrier in Ireland showed an increase (11 – 12 pairs) in the number of breeding pairs within the Slieve Bloom Mountains SPA; a slight increase from the previous highest total in 1998 – 2000 (from 10 – 11 pairs in 1998 – 2000 to 11 – 12 in 2015). This represents 8.2% of the national population and 18.8% of the Irish SPA network population. The survey shows breeding success of confirmed pairs at the site was estimated to be 53.8% which is higher than the national estimate (45%) and higher than the estimated rate for the total SPA population (49%). This SPA produced 14 fledged young, equating to 13.7% of the total minimum number of fledged birds in Ireland and represents 25% of the total SPA population of fledged birds. According to Ruddock et. al. (2016) the stable hen harrier population at the site is to be due to the specific management/conservation of the blanket bog ecosystem within the Slieve Bloom Reserve, which has resulted in high quality moorland habitat that is relatively stable between years. This is despite high forest cover in the area. Other raptor species known to occur at the site are Peregrine falcon (<i>Falco peregrinus</i>) and Merlin (<i>Falco columbarius</i>). Both of these species are listed on Annex I of the EU Birds Directive.	
Natural Heritage Areas			
Clonreher Bog NHA	0.4	Clonreher Bog NHA is located 6km south of the town of Mountmellick in the townlands of Clonreher, Rosnagad and Clonsoghey, Co.Laois. It is situated just west of the Mountmellick to Portlaoise road (N80). This site comprises a raised bog that includes both areas of high bog and cutover bog. The site is bounded by the N80 to the east and the abandoned railway line (Mountmellick Branch) to the west.	Potential indirect air pathway to the Site No hydrogeological or hydrological connection to the site – upgradient of the site. No other pathways identified

		It can be accessed from bog tracks off the N80, to the north-east and south-east of the site. Much of the high bog has vegetation typical of a Midland Raised Bog, dominated by bog moss (<i>Sphagnum</i>) species, over which grow Ling Heather (<i>Calluna vulgaris</i>), Cross-leaved Heath (<i>Erica tetralix</i>), Deergrass (<i>Scirpus cespitosus</i>), Bog Asphodel (<i>Narthecium ossifragum</i>) and Bog Rosemary (<i>Andromeda polifolia</i>). To the north and south of the intact dome are expanses of cutaway bog, which are no longer in use and which are now overgrown with Purple Moor-grass (<i>Molinia caerulea</i>) and Ling Heather (<i>Calluna vulgaris</i>). In some areas Gorse (<i>Ulex europaeus</i>) and/or Downy Birch (<i>Betula pubescens</i>) are colonising and creating patches of scrub. There is an extensive area of scrub along the abandoned railway line to the west. Current landuses on the site include peat-cutting and agriculture. Active peat-cutting occurs to the south and north. Damaging activities associated with these landuses include drainage at the bog margins and burning on the high bog in connection with peat-cutting. Frequent burning is detrimental to the bog as it causes dessication of the surface and removal of semi-natural vegetation. These activities have resulted in the loss of habitat, damage to the hydrological status of the site, and pose a continuing threat to its viability. Clonreher Bog NHA is a site of considerable conservation significance comprising as it does a raised bog, a rare habitat in the E.U. and one that is becoming increasingly scarce and under threat in Ireland. This site supports a good diversity of raised bog microhabitats and its southerly location, is of ecological interest. Ireland has a high proportion of the total E.U. resource of raised bog (over 50%) and so has a special responsibility for its conservation at an international level.	
Proposed Natural Heritage Areas			
Dunamase Wood pNHA (001494)	7.5	Two small, but prominent hills lie to the west of, and within 1km of, the Rock of Dunamase in Co. Laois. In both cases, unlike the Rock, drift deposits cover underlying limestone. The main vegetation feature of the hills is woodland. The larger area (about 9ha) is found on the western most hill, where the main woodland tree is Pedunculate Oak (<i>Quercus robur</i>), and the size of these trees bear witness to the age of the woodland. Ash (<i>Fraxinus excelsior</i>) is widespread and other trees present include non-native species such as Horse-chestnut (<i>Aesculus hippocastanum</i>), Sweet Chestnut (<i>Castanea sativa</i>) and Sycamore (<i>Acer pseudoplatanus</i>). The soil is well drained and the ground flora, dominated by Bluebell (<i>Hyacinthoides non-scripta</i>) with Lesser Celandine (<i>Ranunculus ficaria</i>), reflects this. The smaller woodland to the east, known as 'Beech Wood' is essentially a similar mix of native Pedunculate Oak and Ash, with Hazel (<i>Corylus avellana</i>) and non-native species, as the name suggests, particularly Beech (<i>Fagus sylvatica</i>). The	Potential hydrogeological connection – downgradient of the site

		ground flora is also similarly dominated by Bluebell with Lesser Celandine and Ground-ivy (<i>Glechoma hederacea</i>). These two woodland blocks are not large, their origin has not been studied, but it is likely that they are historical plantings rather than fragments of ancient woodland. The preponderance of non-native trees detracts from the naturalness of both woodland blocks. However few woodlands occur in Co. Laois, especially those dominated by Pedunculate Oak, a feature of our most prized woodlands. Appropriate management, including the exclusion of stock, and the selective removal of non-native species, would enhance the scientific interest of these sites.	
Rock of Dunamase (000878)	8.48	This site, otherwise named the 'Fort of the Plain', starts on a prominent limestone outcrop 8km east of Portlaoise. It is one in a string of small limestone outcrops in the region. Surrounding the ruined fort, the grassland present has developed in the absence of invasion by scrub. The grass species include Crested Dog's-tail (<i>Cynosurus cristatus</i>), False Oat-grass (<i>Arrhenatherum elatius</i>), Cock's-foot (<i>Dactylis glomerata</i>) and Downy Oat-grass (<i>Helictotrichon pubescens</i>). The more interesting aspects, from the botanical point of view, are the large limestone boulders and the areas of short turf on the very shallow limestone soil. Here, Quaking-grass (<i>Briza media</i>), Fern-grass (<i>Catapodium rigidum</i>) and Heath-grass (<i>Danthonia decumbens</i>) grow and a rich bryophyte flora exists with nine species of moss identified. Herbaceous species such as Lady's Bedstraw (<i>Galium verum</i>) and Hedgerow Crane's-bill (<i>Geranium pyrenaicum</i>) can also be observed. A dense Hazel (<i>Corylus avellana</i>) scrub, with Hawthorn (<i>Crataegus monogyna</i>) and Beech (<i>Fagus sylvatica</i>), encircles the rock. The understorey includes Honeysuckle (<i>Lonicera periclymenum</i>) and Blackthorn (<i>Prunus spinosa</i>) with typical open woodland herbs such as Woodruff (<i>Galium odoratum</i>), Ground-ivy (<i>Glechoma hederacea</i>), Sanicle (<i>Sanicula europaea</i>), and Wood Avens (<i>Geum urbanum</i>). The site is a local picnic spot and is visited by numerous people during summer weekends. Pathways are all worn but otherwise there is no great impact on the grasslands. The density of Hazel scrub prevents much exploration and destruction. The Rock of Dunamase is an interesting botanical site including meadow grassland, shallow limestone soil, pasture and Hazel scrub. It is also important archaeologically, geologically and historically.	
Kilteale Hill pNHA (000867)	9.9	This small limestone outcrop lies about 3km north-west of Stradbally in Co. Laois. It is one in a chain of such outcrops which includes the more westerly Rock of Dunamase. The site primarily consists of a Hazel (<i>Corylus avellana</i>) wood with Ash (<i>Fraxinus excelsior</i>), Blackthorn (<i>Prunus spinosa</i>) and Elder (<i>Sambucus nigra</i>) also present. Patches of gorse (<i>Ulex spp.</i>) and Bracken (<i>Pteridium aquilinum</i>) scrub are	

		also interspersed. Killeale Hill is indicative of climax vegetation for a basic soil. The site serves as an example of Hazel woodlands which formerly vegetated many of the Midland region hillocks.	
Ridge of Portlaoise pNHA (000876)	0.9	The ridge of Portlaoise is an elongated raised ridge or esker formed of sand and gravel which was deposited when a mass of ice covered this area during the last period of glaciation. The esker runs through the eastern part of Portlaoise town and extends in a south-south-east to north-north-west direction. North of the town, the secondary road to Mountmellick runs along the top of the ridge, while south of Portlaoise the L26 road to Timahoe runs alongside it. Much of the esker is wooded. In the southern part, Scots Pine (<i>Pinus sylvestris</i>) and Beech (<i>Fagus sylvatica</i>) form the canopy. Elsewhere, multi-stemmed Hazel (<i>Corylus avellana</i>) and/or Ash (<i>Fraxinus excelsior</i>) predominate, with a range of other native species, for example Wych Elm (<i>Ulmus glabra</i>), Elder (<i>Sambucus nigra</i>), Holly (<i>Ilex aquifolium</i>) and Hawthorn (<i>Crataegus monogyna</i>) occasionally present. Ground flora beneath the woodland canopy includes Wood Melic (<i>Melica uniflora</i>), Sanicle (<i>Sanicula europaea</i>), Bluebell (<i>Hyacinthoides non-scripta</i>), with a range of ferns such as Hart's-tongue (<i>Phyllitis scolopendrium</i>) and grasses including False Brome (<i>Brachypodium sylvaticum</i>). Open grassland on the esker is calcareous and typically species-rich. Quaking-grass (<i>Briza media</i>), Crested Dog's-tail (<i>Cynosurus cristatus</i>) and Cock's-foot (<i>Dactylis glomerata</i>) are among the grasses which predominate. Herbs present include Yarrow (<i>Achillea millefolium</i>), Pignut (<i>Conopodium majus</i>) and Common Bird's-foot-trefoil (<i>Lotus corniculatus</i>). There are a number of disused gravel pits located along the length of the esker which are assessed by means of old trackways. All of these add habitat diversity to the site. Nettle-leaved Bellflower (<i>Campanula trachelium</i>) is a rare species which is legally protected under the Flora Protection Order of 1987. This plant has been recently recorded on this site – a new station for the species. Elsewhere in Ireland it is virtually confined to the south-east of the country, and has been reported from only three sites since 1970. Another rare plant, listed in the Red Data Book, Blue Fleabane (<i>Erigeron acer</i>), occurs in disused gravel pits within the site. It is a plant of eskers, dry grassland, sandy pastures and walls (especially on calcium-rich substrates) and has been recorded from only five 10km squares since 1970. Light grazing by cattle/sheep is not necessarily incompatible with conservation of esker habitats although overgrazing can result in a lack of tree regeneration and damage to ground flora. Eskers are under increasing threat in Ireland, due to the demand for sand and gravel for the construction industry. Of the few eskers which	

		have survived, only a small percentage retain their semi-natural flora of woodland and this is one of the best examples of esker in Co. Laois, along with those at Timahoe (000421) to the southeast and Clonaslee (000859), to the north-west. The ridge of Portlaoise also has two rare plants, one of which is protected under the Flora Protection Order.	
The Great Heath of Portlaoise pNHA (000881)	6.6	The Great Heath of Portlaoise, otherwise known as the Great Heath of Maryborough, is located by the main Portlaoise to Monasterevin road about 6km north of Portlaoise. Much of the proposed Natural Heritage Area (NHA) is made up by The Heath Golf Club. The main vegetation is that of an acidic grassland formed mainly of Sweet Vernalgrass (<i>Anthoxanthum odoratum</i>), Creeping Bent (<i>Agrostis stolonifera</i>), Common Bent (<i>A. capillaris</i>), and Red Fescue (<i>Festuca rubra</i>) with various herbs typical of acidic places, such as Heath Bedstraw (<i>Galium saxatile</i>), Tormentil (<i>Potentilla erecta</i>) and Bitter-vetch (<i>Lathyrus linifolius</i>). Other herbs indicate areas where the soil is not as acidic. Mosses such as <i>Rhytidiadelphus squarrosus</i> are typical. The flatter central areas have accumulated peat, which has since been cut away, but the vegetation still reflects an organic soil with plants such as Mat-grass (<i>Nardus stricta</i>), Heather (<i>Calluna vulgaris</i>) and Purple Moor-grass (<i>Molinia caerulea</i>). The north-east of the NHA area slopes slightly to the east, here there is no trace of peat, the area is less intensively managed than elsewhere and the vegetation is generally taller with some additional species such as Tufted Hair-grass (<i>Deschampsia cespitosa</i>) and Star Sedge (<i>Carex echinata</i>). Stands of Gorse (<i>Ulex europaeus</i>) scrub are scattered throughout, and are controlled by occasional burning. There are two small wetlands within the site. The first, Bog Lough, lies between the golf course and the road, and here amongst the bushy Gorse there are patches of particularly rich grassland with Sheep's fescue (<i>Festuca ovina</i>), Pill Sedge (<i>Carex pilulifera</i>), and several other sedges (<i>Carex</i> spp.). The open water is fringed by Water Horsetail (<i>Equisetum fluviatile</i>) and patches of Bulrush (<i>Typha latifolia</i>) with other emergent species such as Lesser Water-parsnip (<i>Berula erecta</i>). Common Water-crowfoot (<i>Ranunculus aquatilis</i>) and duckweeds (<i>Lemna minor</i> and <i>L. trisulca</i>) make up the aquatic flora. The second wetland is a fen in front of the Catholic Church in the western end of the site. Here calcareous springs feed the area and the vegetation is consequently markedly different from the rest of the site. Black Bog-rush (<i>Schoenus nigricans</i>), Blunt-flowered Rush (<i>Juncus subnodulosus</i>) and Purple Moor-grass (<i>Molinia caerulea</i>) predominate. Species such as Fragrant Orchid (<i>Gymnadenia conopsea</i>) and Bog Pimpernel (<i>Anagallis tenella</i>) also testify to its mineral enrichment.	No pathways identified

		Between these areas is winter wet grassland which constitutes an important part of the site with an abundance of Common Sedge (<i>Carex nigra</i>), <i>Sphagnum denticulate</i> and another moss <i>Aulacomnium palustre</i>. The Great Heath is perhaps something of a misnomer, it is more an acid grassland than a heath and it is no longer as extensive as it used to be. Lowland acidic grassland of this type is now very rare in Ireland, having declined due to liming and fertilisation. Although this site has not escaped disturbance, (it includes the Golf course, a G.A.A. pitch, small areas of ploughing, horse gallops, motorbike trails, caravans and most recently the Portlaoise By-Pass), the integrity of the vegetation has survived remarkably well. Apart from the rarity of the grassland formation, the site also supports plant species that are rare in the county, such as the Few-flowered Spike-rush (<i>Eleocharis quinqueflora</i>) and Fen Bedstraw (<i>Galium uliginosum</i>) both from the wetland areas. The range of variation on site according to peat content, moisture content and base status of the soil, adds an extra dimension of interest to the site.	
Derries Wood pNHA (000416)	10.07	Derries Wood is situated less than 2km south-west of Ballybrittas, adjacent to the main Dublin - Portlaoise Road. Much of the site is disturbed bog habitat, lying in the former flood plain of the nearby River Barrow. The site mainly consists of a mixed coniferous plantation grading from mature Scots Pine (<i>Pinus sylvestris</i>) to newly planted Sitka Spruce (<i>Picea sitchensis</i>). In more open areas and in more recently planted sections, the native trees of Downy Birch (<i>Betula pubescens</i>), Alder (<i>Alnus glutinosa</i>), Ash (<i>Fraxinus excelsior</i>), Hawthorn (<i>Crataegus monogyna</i>) and Holly (<i>Ilex aquifolium</i>) occur, beneath which Heather (<i>Calluna vulgaris</i>) and Purple Moor-grass (<i>Molinia caerulea</i>) grow. In parts, for instance Fox Covert at the south-eastern end, mature Beech (<i>Fagus sylvatica</i>) is found. Also included in the site is Rathdoire Lake with its associated reed-beds, a fen area with tussocks of sedge in a shallow lake (<i>Dease's Bog</i>) and a disused gravel pit. Derries Wood is of conservation significance, particularly for the presence of populations of several rare insects, most notably Criorhina ranunculi (<i>Diptera, Syrphidae</i>) in Beechwood and Chrysops caecutiens (<i>Diptera, Tabanidae</i>) on old bog habitat. The varied array of conifers of different species, ages and quality as well as the native species present add to the interest of this site. Stands of mature Beech support a rich diversity of insects. In addition, the lake, fen areas and disused gravel pit, as well as small sections of bog, result in a diversity of habitats on the site. These serve as refuges for a variety of animals and birds, including Sika Deer, Pine Marten, Mute Swan and various duck species.	Potential indirect land pathway due to potential use of the Site by Pine Marten.
Emo Court pNHA (000865)	9.1	Emo Court is an area within the Emo desmesne, 7km south of Portarlinton, Co. Laois. It contains a large mixed woodland, a freshwater lake, parkland and amenity	No pathways identified

		grassland which are surrounded by rich agricultural land and conifer plantations. A semi-natural mixed woodland surrounds the lake on three sides and is comprised of a wide variety of native and exotic deciduous and coniferous species. The canopy is comprised of mature Pedunculate Oak (<i>Quercus robur</i>), Ash (<i>Fraxinus excelsior</i>), birch (<i>Betula pendula</i> and <i>B. pubescens</i>), Yew (<i>Taxus baccata</i>), Rowan (<i>Sorbus acuparia</i>), Goat Willow (<i>Salix caprea</i>) mixed with Beech (<i>Fagus sylvatica</i>), Scots Pine (<i>Pinus sylvestris</i>), Sycamore (<i>Acer psuedoplatanus</i>) and a variety of exotic conifers. Within these woods, particularly near the lake, are spectacular, large specimens of Pedunculate Oak and Yew. The ground flora is inhibited by the spread of Rhododendron (<i>Rhododendron ponticum</i>) in some areas but where it is not invasive there is a rich cover on the forest floor. The ground flora features Sanicle (<i>Sanicula europaea</i>), Bluebell (<i>Hyacinthoides non-scripta</i>), Early-purple Orchid (<i>Orchis mascula</i>), Honeysuckle (<i>Lonicera periclymenum</i>), Wood-sorrel (<i>Oxalis acetosella</i>) and a variety of ferns and mosses. The woodland is the site of a rare Myxomycete fungus, Stemonitis herbatica. Emo Lake is a medium sized shallow lake with an extensive fringe of reed-beds. The aquatic flora is rather sparse but there is a rich bird and invertebrate fauna. This lake is one of the few remaining freshwater lakes in County Laois. A study of its invertebrate fauna found it to contain several species of interest such as the Cladocera species Scapholeberis mucronata and Disparalona rostrata, which is rare in the British Isles, and the Copepoda species, Eudiaptomus gracilis. Several areas of conifer plantation were also included in the site to retain what is left of the woodland cover around the lake. Rowan, Ash and other native trees are naturally regenerating within and on the margins of these plantations. Some clearfelled areas with mature oak (<i>Quercus spp.</i>) and Beech, scrub and heath communities have also been included. On the south-west shore of the lake, large parkland and gardens occur. This area, known as the Grapery, is comprised of a collection of native and introduced species from all over the world including oak, Beech, Holm Oak (<i>Quercus ilex</i>), Tree of Lebanon (<i>Cedrus libani</i>), Japanese Maple (<i>Acer palmatum</i>), Copper Beech (<i>Fagus sylvatica Purpurea Group</i>), Lime (<i>Tilia x europaea</i>), Horse-chestnut (<i>Aesculus hippocastanum</i>), Holly (<i>Ilex aquifolium</i>), Whitebeam (<i>Sorbus aria agg.</i>) and Yew with a variety of exotic shrubs. Despite being considerably reduced in size by conifer afforestation, Emo Court is one of the few remaining vestiges of mature climax forest in this region. Abbeyleix Woods is the only other woodland in the county of similar extent and quality.	

Shanahoe Marsh pNHA (001923)	14.6	No description available	No pathways identified
Slieve Bloom Mountains pNHA (000142)	5.9	No description available, assumed to align with the designations of Slieve Bloom Mountains SAC.	No pathways identified
Stradbally Hill pNHA (001800)	14.5	This site lies about 2km south-east of Stradbally in a chain of limestone hills, which are occasionally indented by caves. The site comprises three separate woodland areas. Ballykilcavan Wood is dominated by Pedunculate Oak (<i>Quercus robur</i>) with Ash (<i>Fraxinus excelsior</i>), Downy Birch (<i>Betula pubescens</i>) and sections of coniferous plantations interspersed. The understorey flora includes Honeysuckle (<i>Lonicera periclymenum</i>), Bramble (<i>Rubus fruticosus</i> agg.), ferns, Lesser Celandine (<i>Ranunculus ficaria</i>), Bluebell (<i>Hyacinthoides non-scripta</i>) and Ivy (<i>Hedera helix</i>). The woodland at Kylebeg is also Pedunculate Oak-dominated, with scattered Ash and Wild Cherry (<i>Prunus avium</i>). Hazel (<i>Corylus avellana</i>) and Spindle-tree (<i>Euonymus europaeus</i>) occur in the understorey. A small conifer plantation lies in the northern part of the site. The most southerly section of the site, near Ballintlea is, in contrast, a mixed wood of Hazel, Beech (<i>Fagus sylvatica</i>) and planted conifers. Ballykilcavan Wood encloses a small lake which adds habitat diversity to the site, as do the small areas of scrubland scattered throughout the site. The most serious damaging operation occurring within the woodlands is the clearance of mature deciduous trees, especially Pedunculate Oaks. Frequently coupled with this activity is the replanting of such areas with coniferous trees. This serves to reduce the site quality by replacing native, wildlife-rich trees with exotic species. Another threat is infestation of these woodlands with Cherry Laurel (<i>Prunus laurocerasus</i>) which has already occurred in places in Kylebeg Wood. Stradbally Hill is an important woodland site containing many mature oaks and Hazel. Extensive stands of mature oak on mineral soil are unusual in the county and the country as a whole.	No pathways identified
Timahoe Esker pNHA (000421)	12.9	Eskers are raised ridges of sand and gravel which were deposited under the ice mass, during the last period of glaciation. They provide well-drained base-rich substrates for plants. This site consists of two small eskers which lie approximately 1km north of the town of Timahoe in Co. Laois. The esker ridges at this site support broad-leaved woodland dominated by multistemmed Hazel (<i>Corylus avellana</i>). Also present are Ash (<i>Fraxinus excelsior</i>), oak (<i>Quercus</i> spp.), Holly (<i>Ilex aquifolium</i>), Elder (<i>Sambucus nigra</i>) and Hawthorn	No pathways identified

		(<i>Crataegus monogyna</i>). Beech (<i>Fagus sylvatica</i>) occurs frequently at this site. It is a non-native tree which has naturalized in Ireland. Beneath the canopy, the ground flora typically includes Bluebell (<i>Hyacinthoides non-scripta</i>), Primrose (<i>Primula vulgaris</i>) and violets (<i>Viola</i> spp.). Occasional gaps in the canopy occur and here Gorse (<i>Ulex europaeus</i>) and Bracken (<i>Pteridium aquilinum</i>) are found. These eskers are currently owned by the State, and constitute a Nature Reserve. Other eskers in the vicinity have been destroyed by the quarrying of their sand and gravel, this trend is apparent on a nationwide scale and esker habitats are diminishing, and therefore under threat. The Timahoe Eskers are important as among the best of the few intact eskers remaining in Co. Laois.	

5.10.4 Habitats

During the Site walkovers on 9th December 2025 and 6th March 2026, as well as the follow up habitat walkover on 26th January 2026 which included a detailed habitat survey, habitats were identified to Level 3 (codes follow Fossitt, 2000), see Figure 5-1. The predominant habitat on-site is Cutover Bog (PB4), closely followed by interspersed areas of Bog Woodland (WN7) habitat. There is also a number of small areas of Dense Bracken (HD1) and a network of Drainage Ditches (FW4).

5.10.4.1 Cutover Bog (PB4)

The dominant habitat at the Site was cutover bog habitat. Species observed within this habitat include Heather (*Calluna vulgaris*), Cross Leaved Heath (*Erica tetralix*), Purple Moor Grass (*Molinia* sp.), St John's wort (*Hypericum perforatum*) and *Juncus* spp. Stands of Bramble (*Rubus fruticosus*) were also present in areas, as well as scattered Silver Birch (*Betula pendula*), Scots pine (*Pinus sylvestris*) and Willow (*Salix* sp.) which were colonising sporadically. Devils Bit Scabious (*Succisa pratensis*) was present in one isolated spot within the Site boundary, as well as two plants identified roughly 120m from the boundary. The plant within the Site was situated within the cutover bog habitat bordering a section of bog woodland in the west half of the Site (see Figure 5-1); this species is the sole food plant of Marsh Fritillary (*Euphydryas aurinia*), the only Annex II protected Butterfly species in Ireland.

5.10.4.2 Bog Woodland (WN7)

Areas of bog woodland habitat were present along the northern boundary, as well as within the southeast corner, and western half of the Site. These areas are natural woodlands that have established following peat extraction/ degradation. They are mature, dominated by Downy Birch (*Betula pubescens*) and Scots Pine (*Pinus sylvestris*). There is evidence of past clearing from brash on the ground and a check of Google Earth Historical Imagery confirms this. To confirm whether this bog woodland habitat is classified as 91D0 – an Annex I habitat protected under the EU Habitats Directive, a detailed habitat survey was conducted on the 26th January 2026. The absence of sphagnum moss and substantial drainage of the peat confirmed that the bog woodland on-site is not classified as 91D0, i.e. cannot be considered Annex I habitat.

5.10.4.3 Dense Bracken (HD1)

Three areas of Dense Bracken habitat (HD1) were scattered within the western half of the Site. These areas were made up of mostly Bracken (*Pteridium aquilinum*) stands growing in close proximity to each other – shading out suitable habitat for other floral species as such.

5.10.4.4 Drainage Ditches (FW4)

The Site is intersected by 6 drainage ditches which run south to north, often extending beyond the Site boundary and continuing into surrounding habitat (Figure 5-1). The drainage ditch at the centre of the Site is water filled with Bullrush (*Typha latifolia*) present. The drainage ditches become shallower and drier towards the east, with the only drainage ditch containing permanent water being the western most drainage ditch. This also flows north to south, down to the knackery sheds where it turns southeast and goes under the L2117 and joins the Triogue River.

.



Figure 5-1: Habitat Map of the Proposed Infilling Site

5.10.5 Adjacent and Linked Habitats

5.10.5.1 Bog Woodland and Cutover Bog Mosaic Habitat

The Site is surrounded along the north, west and south boundaries by more bog woodland and cutover bog habitats which are likely to support a variety of the same species supported by these habitats within the Site boundary. The Site represents circa 3% of the total available bog woodland/ cutover bog mosaic habitat in the area.

5.10.5.2 Drainage ditches

The drainage ditches within the Site extend beyond the boundary to the North and South of the Site. These are likely to share characteristics of the sections of drainage ditch within the Site boundary to support similar flora and fauna.

5.10.5.3 Triogue River

As discussed in Section 5.10.1, the Triogue River is connected hydrologically and hydrogeologically to the Site via overland drainage and groundwater movement from the Site. This River is a tributary to the River Barrow. As such, it is likely to support a variety of riverbank and aquatic flora and fauna.

5.10.5.4 River Barrow

As discussed in Section 5.10.1, the River Barrow is connected hydrologically to the Site via overland drainage and subsequent flow via the Triogue River. The River Barrow supports a variety of riverbank and aquatic flora and fauna, including a range of protected and rare species.

5.10.6 Species and Species Groups

5.10.6.1 Flora

5.10.6.1.1 Rare and Protected Flora

Desk Results

The Site of the Proposed Development is located within the Ordnance Survey 10km Grid Square (N40), 2km Grid Square (N40L) and 1km Grid Square (N4502). Species records from the NBDC online database of these grid squares were studied for the presence of rare and/or protected species within the last 20 years. This database contained several records of protected flora within the last 20 years, as well as a vulnerable Liverwort species within the 10km grid square, however no endangered species occurred within any grid square (Table 5-3).

The FPO Bryophytes database was also checked for rare and protected flora records within the vicinity of the Proposed Development. No rare and/or protected bryophyte records exist within the vicinity of the Proposed Development.

Table 5-3: Rare and Protected Flora historically recorded within the relevant grid squares encompassing the Site

Name	Grid Square	Date of last record	Database	Designation

Scissors Pincerwort (<i>Cephalozia loitlesbergeri</i>)	N40 N40L	18/05/2009	Bryophytes Ireland	of	Threatened Species: Vulnerable
Acute-leaved Bog-moss (<i>Sphagnum capillifolium</i> s.l.)	N40 N40L	18/05/2009	Bryophytes Ireland	of	Protected Species: EU Habitats Directive (Annex V)
Austin's Bog-moss (<i>Sphagnum austinii</i>)	N40 N40L	18/05/2009	Bryophytes Ireland	of	Protected Species: EU Habitats Directive (Annex V)
Cow-horn Bog-moss (<i>Sphagnum auriculatum</i>)	N40 N40L	18/05/2009	Bryophytes Ireland	of	Protected Species: EU Habitats Directive (Annex V)
Feathery Bog-moss (<i>Sphagnum cuspidatum</i>)	N40 N40L	18/05/2009	Bryophytes Ireland	of	Protected Species: EU Habitats Directive (Annex V)
Large White-moss (<i>Leucobryum glaucum sensu Smith (2004)</i>)	N40 N40L	18/05/2009	Bryophytes Ireland	of	Protected Species: EU Habitats Directive (Annex V)
Papillose Bog-moss (<i>Sphagnum papillosum</i>)	N40 N40L	18/05/2009	Bryophytes Ireland	of	Protected Species: EU Habitats Directive (Annex V)
Soft Bog-moss (<i>Sphagnum tenellum</i>)	N40 N40L	18/05/2009	Bryophytes Ireland	of	Protected Species: EU Habitats Directive (Annex V)

Field Results

As discussed in Section 5.10.4.1, Devils Devils Bit Scabious (*Succisa pratensis*) was present in three isolated spots outside of the Site boundary, with the closest 7m from the Site (see Figure 5-1); this species is the sole food plant of Marsh Fritillary (*Euphydryas aurinia*) which are an Annex II protected Butterfly species in Ireland.

No other rare or protected flora were observed within or around the Site on any of the Site walkovers.

5.10.6.1.2 Invasive Species

Desk Results

There are records for 5 invasive species within the grid squares which encompass the Site of the Proposed Development. Details of these records are listed in Table 5-4.

Table 5-4: Records of Invasive Species within the relevant grid squares of the Site

Name	Grid Square	Date of last record	Database	Designation
Canadian Waterweed (<i>Elodea canadensis</i>)	N40	31/12/2010	BSBI tetrad data for Ireland	High Impact Invasive Regulation S.I. 477 (Ireland)
Japanese Honeysuckle (<i>Lonicera japonica</i>)	N40 N40L	14/09/2016	National Invasive Species Database	Medium Impact Invasive

Japanese Knotweed (<i>Fallopia japonica</i>)	N40 N40L N4502	27/07/2017	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	High Impact Invasive Regulation S.I. 477 (Ireland)
Sycamore (<i>Acer</i> <i>pseudoplatanus</i>)	N40	29/08/2024	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Medium Impact Invasive
Traveller's-joy (<i>Clematis vitalba</i>)	N40	02/09/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Medium Impact Invasive

Field Results

No invasive floral species were observed on any of the Site walkovers.

5.10.6.1.3 Evaluation

Although there were no rare or protected floral species recorded during any Site walkover, it should be noted that these were undertaken outside of the botanical survey season. Given this, coupled with the fact that a significant number of plant species classified as vulnerable, or protected under Annex V of the EU habitats directive have been historically recorded within 2km of the Site, a precautionary approach will be taken, and the presence of rare or protected flora on the Site is not to be ruled out at this stage. As such, rare and protected flora will be classified as KERs to be assessed further in this chapter

Although there were no invasives species recorded during any Site walkover, it should be noted that these were undertaken outside of the botanical survey season. Given this, coupled with the fact that Japanese Knotweed (*Fallopia japonica*) a high impact third schedule invasive species has been recorded within the 1km grid square of the Site, a precautionary approach will be taken, and the presence of invasives on the Site is not to be ruled out at this stage. As such, invasives will be classified as KERs to be assessed further in this chapter.

5.10.6.2 Bats

5.10.6.2.1 Desk Study Results

A total of 6 bat species have been recorded within the 10km grid square which encompasses the Site (*Table 5-5*).

Table 5-5: Bat Species historically recorded within the 10km grid square of the Site.

Name	Grid Square	Date of last record	Database	Designation
Brown Long-eared Bat (<i>Plecotus auritus</i>)	N40	30/05/2014	National Database Ireland	Bat of EU Habitats Directive - Annex IV Wildlife Act 1976 (as amended)
Common Pipistrelle (<i>Pipistrellus pipistrellus sensu stricto</i>)	N40	24/06/2022	National Database Ireland	Bat of EU Habitats Directive - Annex IV Wildlife Act 1976 (as amended)

Daubenton's Bat (<i>Myotis daubentonii</i>)	N40	27/08/2021	National Database Ireland	Bat of	EU Habitats Directive - Annex IV Wildlife Act 1976 (as amended)
Leisler's Bat (<i>Nyctalus leisleri</i>)	N40 N40L	01/09/2021	National Database Ireland	Bat of	EU Habitats Directive - Annex IV Wildlife Act 1976 (as amended)
Natterer's Bat (<i>Myotis nattereri</i>)	N40	01/08/2007	National Database Ireland	Bat of	EU Habitats Directive - Annex IV Wildlife Act 1976 (as amended)
Soprano Pipistrelle (<i>Pipistrellus pygmaeus</i>)	N40	29/05/2019	Heritage Council's Traditional Farm Buildings Scheme Fauna Records from 2016 to 2023		EU Habitats Directive - Annex IV Wildlife Act 1976 (as amended)

The Site area is indicated by the black box in Figure 5-2. The overall habitat suitability index for bats is 29 – this is medium suitability. The species with the highest individual suitability scores for this area of the Site are Common pipistrelle (*Pipistrellus pipistrellus*) with a score of 46 Lesser noctule (*Nyctalus leisleri*) with a score of 40, Soprano pipistrelle (*Pipistrellus pygmaeus*) with a score of 38 and Brown long-eared bat (*Plecotus auritus*) with a score of 37 (Table 5-6).

Table 5-6: Habitat Suitability Index of the Site for Irish Bat Species

Bat Species	Suitability Index for the Site (5km Grid Square)
Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>)	38 (High)
Brown long-eared bat (<i>Plecotus auritus</i>)	37 (High)
Common pipistrelle (<i>Pipistrellus pipistrellus</i>)	46 (High)
Lesser horseshoe bat (<i>Rhinolophus hipposideros</i>)	0 (Low)
Lesser noctule (<i>Nyctalus leisleri</i>)	40 (High)
Whiskered bat (<i>Myotis mystacinus</i>)	23 (Medium)
Daubenton's bat (<i>Myotis daubentonii</i>)	30 (Medium-High)
Nathusius' pipistrelle (<i>Pipistrellus nathusii</i>)	6 (Low)
Natterer's bat (<i>Myotis nattereri</i>)	41 (High)

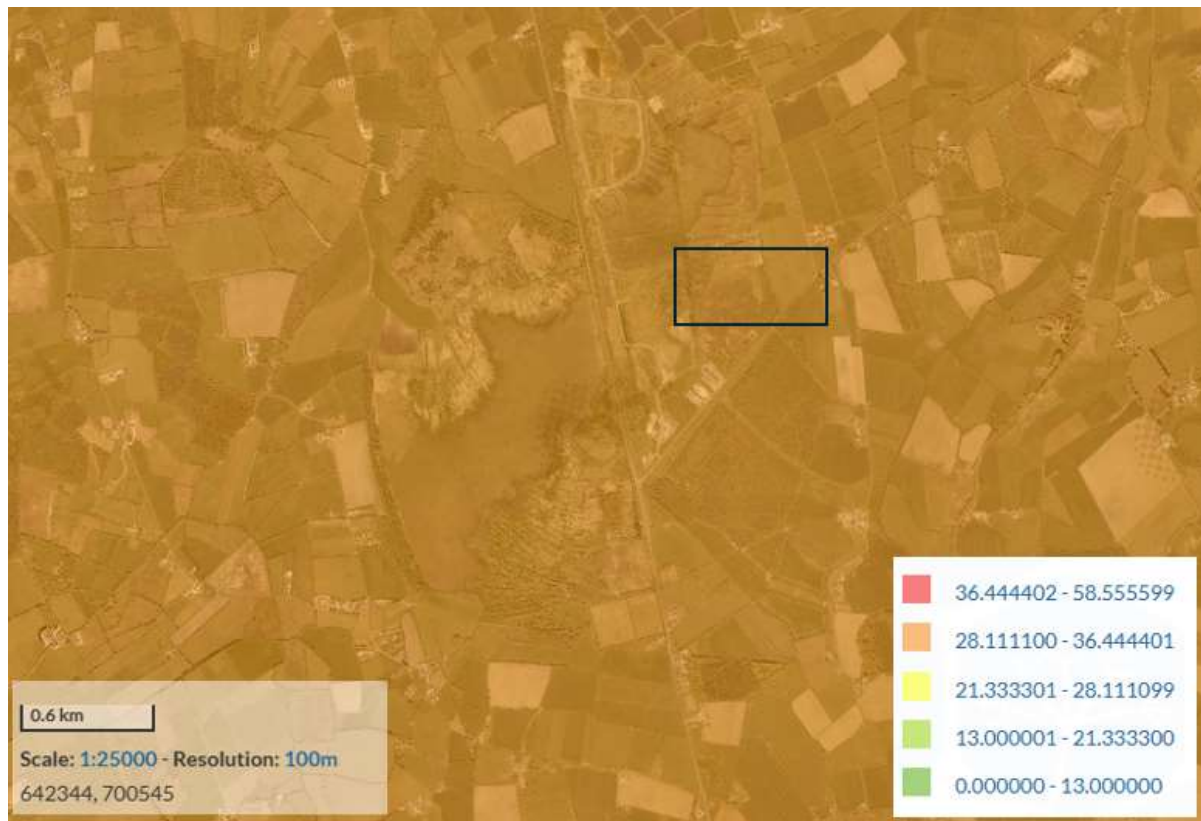


Figure 5-2: Bat Landscape Suitability Model (all bats) surrounding the Site of Proposed Infilling (Adapted from NBDC)

5.10.6.2.2 Field Survey Results

Bat Habitat Suitability and Roost Assessment

The linear habitat features such as the treelines within the Site were assessed for bat roosting potential and foraging/commuting suitability. Whilst the area is very suitable for bat foraging and commuting, there were no potential roost features identified on either of the two Site walkovers undertaken; the Site had an absence of trees with features suitable for supporting roosting bats.

5.10.6.2.3 Evaluation

No PRFs were identified on-site during any walkover. However, given the medium Bat landscape suitability of the Site, the range of species historically recorded within the vicinity of the Site, as well as the presence of highly suitable foraging and commuting habitat for Bats on-site, use of the Site by Bats cannot be ruled out, thus bats will be classified as KERs to be assessed further in this chapter.

5.10.6.3 Birds

5.10.6.3.1 Desk Study Results

A total of 80 bird species were identified within the 10km grid square. No bird species have been recorded within the 2km grid square since 1991, this is most likely due to low survey frequency within the area. Of those within the 10km grid square, 14 are red listed and 20 are amber listed as identified on the Birds of Conservation Concern in Ireland (BoCCI) (Gilbert et al. 2021). Details of amber and red listed species are presented in *Table 5-7*.

Table 5-7: Bird species historically recorded within the grid squares associated with the Site of Proposed Infilling

Species	Date of record	BoCCI Status
Barn Owl (<i>Tyto alba</i>)	22/04/2018	Red
Black-tailed Godwit (<i>Limosa limosa</i>)	31/12/2011	Red
Curlew (<i>Numenius arquata</i>)	27/10/2022	Red
Dunlin (<i>Calidris alpina</i>)	29/11/2022	Red
Golden Plover (<i>Pluvialis apricaria</i>)	26/04/2023	Red
Grey Wagtail (<i>Motacilla cinerea</i>)	03/05/2019	Red
Kestrel (<i>Falco tinnunculus</i>)	26/04/2023	Red
Lapwing (<i>Vanellus vanellus</i>)	20/03/2023	Red
Meadow Pipit (<i>Anthus pratensis</i>)	20/03/2023	Red
Redwing (<i>Turdus iliacus</i>)	01/01/2025	Red
Snipe (<i>Gallinago gallinago</i>)	06/04/2023	Red
Swift (<i>Apus apus</i>)	06/06/2025	Red
Woodcock (<i>Scolopax rusticola</i>)	31/12/2011	Red
Yellowhammer (<i>Emberiza citrinella</i>)	03/05/2022	Red
Black-headed Gull (<i>Chroicocephalus ridibundus</i>)	28/02/2023	Amber
Cormorant (<i>Phalacrocorax carbo</i>)	20/03/2023	Amber
Gadwall (<i>Mareca strepera</i>)	31/12/2011	Amber
Goldcrest (<i>Regulus regulus</i>)	31/12/2011	Amber
Greenfinch (<i>Chloris chloris</i>)	23/05/2018	Amber
Hen Harrier (<i>Circus cyaneus</i>)	31/12/2011	Amber
House Martin (<i>Delichon urbicum</i>)	03/05/2022	Amber
House Sparrow (<i>Passer domesticus</i>)	31/12/2011	Amber
Kingfisher (<i>Alcedo atthis</i>)	23/09/2022	Amber
Linnet (<i>Linaria cannabina</i>)	31/12/2011	Amber
Mallard (<i>Anas platyrhynchos</i>)	28/02/2023	Amber
Merlin (<i>Falco columbarius</i>)	28/07/2016	Amber
Mute Swan (<i>Cygnus olor</i>)	27/10/2022	Amber
Sand Martin (<i>Riparia riparia</i>)	31/12/2011	Amber
Skylark (<i>Alauda arvensis</i>)	20/03/2023	Amber

Starling (<i>Sturnus vulgaris</i>)	01/01/2025	Amber
Swallow (<i>Hirundo rustica</i>)	11/04/2021	Amber
Teal (<i>Anas crecca</i>)	31/12/2011	Amber
Whooper Swan (<i>Cygnus cygnus</i>)	29/11/2022	Amber
Willow Warbler (<i>Phylloscopus trochilus</i>)	11/05/2013	Amber

5.10.6.3.2 Field Survey Results

Bird Scoping Surveys

During the PEA walkover survey and follow up walkovers, a total of 3 bird species were identified, 2 of which are red listed, and 1 of which is amber listed as shown within *Table 5-8* below. The locations of the red listed birds in and around the Site are shown on Figure 5-3.

Table 5-8: Bird species observed on the Site of the Proposed Infilling during PEA and follow up walkover surveys.

Species	Date of record	BoCCI Status	Observation
Meadow Pipit (<i>Anthus pratensis</i>)	09/12/2025	Red	Flushed, calling
Woodcock (<i>Scolopax rusticola</i>)	26/01/26	Red	Flushed from scrub
Goldcrest (<i>Regulus regulus</i>)	09/12/2025	Amber	-

The cutover bog and bog woodland habitats, which contained scattered areas of scrub within were noted to be suitable to support several common bird species.

The Site also contained a significant volume of deadwood including dead Birch trees, with Birch Polypore (*Fomitopsis betulina*) fungi present – these habitats are suitable for species such as Great Spotted Woodpecker which utilise such features for drumming, feeding and nesting.



Figure 5-3: Location of red listed birds identified in and around the Site during the bird scoping surveys undertaken on 2025 and 2026 Site Surveys

5.10.6.3.3 Evaluation

The 2km grid square encompassing the Site has been found to historically support red and amber listed breeding and wintering bird species, and a few of such species have been confirmed as currently utilising the Site during the bird scoping surveys. Given this, coupled with the presence of suitable wintering and breeding bird habitats confirmed in and around the Site, it is determined that the Site may be of high ecological value for both wintering and breeding bird species.

No wintering or breeding bird surveys have been undertaken at the Proposed Infilling Site thus far. In the absence of breeding and wintering bird survey data, and recognisant of the above findings, the precautionary principle has been applied, and it has been determined that use of the Site cannot be ruled out. As such, both wintering and breeding birds are brought forward as independent KERs for further assessment and discussion in this chapter.

5.10.6.4 Mammals (excl. bats)

5.10.6.4.1 Desk Study Results

Records for terrestrial mammals were obtained from the NBDC online database. *Table 5-9* lists these species, their date of last record and summarises their protected status/designation. In total, 15 mammals species (11 native, 4 non-native or invasive) were recorded within the grid squares which encompass the Site.

Table 5-9: Records of terrestrial mammals (native and non-native) for the surrounding 10km and 2km grid squares associated with the Site from the NBDC.

Name	Grid Square	Date of last record	Database	Designation
Native Species				
Badger (<i>Meles meles</i>)	N40	28/02/2017	Mammals of Ireland 2016-2025	Wildlife Act 1976 (as amended)
West European Hedgehog (<i>Erinaceus europaeus</i>)	N40	03/06/2023	Hedgehogs of Ireland	Wildlife Act 1976 (as amended)
House Mouse (<i>Mus musculus</i>)	N40	06/01/2011	Atlas of Mammals in Ireland 2010-2015	Not legally protected
Irish Hare (<i>Lepus timidus</i> subsp. <i>hibernicus</i>)	N40	11/05/2013	Atlas of Mammals in Ireland 2010-2015	Wildlife Act 1976 (as amended) EU Habitats Directive – Annex V
Irish Stoat (<i>Mustela erminea</i> subsp. <i>hibernica</i>)	N40	04/10/2013	Atlas of Mammals in Ireland 2010-2015	Wildlife Act 1976 (as amended)
European Otter (<i>Lutra lutra</i>)	N40	11/10/2013	Atlas of Mammals in Ireland 2010-2015	Wildlife Act 1976 (as amended) EU Habitats Directive – Annex II & IV
Pine Marten (<i>Martes martes</i>)	N40 N40L	20/11/2020	Mammals of Ireland 2016-2025	Wildlife Act 1976 (as amended) EU Habitats Directive – Annex V
European Pygmy Shrew (<i>Sorex minutus</i>)	N40	06/05/2018	Mammals of Ireland 2016-2025	Wildlife Act 1976 (as amended)

Red Fox (<i>Vulpes vulpes</i>)	N40 N40L	01/10/2018	Mammals of Ireland 2016-2025	Not legally protected
Red Squirrel (<i>Sciurus vulgaris</i>)	N40	02/09/2017	Mammals of Ireland 2016-2025	Wildlife Act 1976 (as amended)
Wood Mouse (<i>Apodemus sylvaticus</i>)	N40	02/10/2013	Atlas of Mammals in Ireland 2010-2015	Not legally protected
Non-native Species				
Bank Vole (<i>Myodes glareolus</i>)	N40	06/01/2011	Atlas of Mammals in Ireland 2010-2015	Medium Impact Invasive species
Brown Rat (<i>Rattus norvegicus</i>)	N40	02/10/2013	Atlas of Mammals in Ireland 2010-2015	High Impact Invasive Species Regulation S.I. 477/2011 (Ireland) – Offshore Islands Only
Fallow Deer (<i>Dama dama</i>)	N40	28/02/2014	Atlas of Mammals in Ireland 2010-2015	High Impact Invasive Species Regulation S.I. 477/2011 (Ireland) - Specified provisions of Regulations 49 and 50
Rabbit (<i>Oryctolagus cuniculus</i>)	N40	13/05/2017	National Invasive Species Database	Medium Impact Invasive Species

5.10.6.4.2 Field Study Results

A search of the Site for signs of fauna was carried out on 9th December 2025, followed by 2 additional walkovers in 2026.

A European Otter (*Lutra lutra*) spaint was identified around one of the smaller drainage ditches to the southwest of the Site boundary (Figure 5-4). This confirms use of the drainage ditches which run through the Site by Otter, which are likely to have travelled up from the Triogue River which is located 0.23km south of the Site boundary. No evidence of Otter holts in or around the Site was observed however, and it is likely that this species use the Site for commuting and foraging only. Given the confirmed usage of the adjoining drainage ditches to the Site by Otter, and suitable habitat in the form of drainage ditches with vegetated banks, this species is classified as a KER to be assessed further.



Figure 5-4: Location of Otter Spraint found during the Mammal walkover survey on 26th January 2026

No evidence of Badger was observed. Additionally, the cutover peat and bog woodland is not considered optimal habitat for Badger. Whilst it is not impossible that the species could utilise it for foraging and commuting through and the Badger have been recorded within the 10km grid square surrounding the Site., there is an abundance of agricultural land with hedgerow boundaries to the east which the species are much more likely to utilise, and given that the Site does not connect to additional optimal habitat badger usage of the Site can be ruled out.

A mammal trail was observed within the southeastern boundary of the Site. These are likely to be fox given the size. In addition a small mammal trail in the centre of the southern boundary of the Site was identified.

Suitable habitat was present for both Pine Marten and Red Squirrel in the form of coniferous trees such as Scott's Pine which were scattered within and around the Site of varying maturity. There was a possibility for den sites for Pine Marten noted also within the limited deadwood areas. However, no signs or individuals of these species, or suitable nesting hollows for pine marten were observed. Overall, there was a moderate to high habitat suitability for red squirrel and a moderate habitat suitability for Pine Marten.

This is also the case for Irish Hare (*Lepus timidus*), and the small mammals historically recorded within the 10km and 2km grid square(s) of the Proposed Infilling Site including West European Hedgehog (*Erinaceus europaeus*), Irish Stoat (*Mustela erminea subsp. hibernica*) and European Pygmy Shrew (*Sorex minutus*). Although no signs of such species were observed such as Irish Hare forms, use of the Site by such species cannot be ruled out and these species, including Pine Marten, Red Squirrel, Irish Hare and small mammals, will be classified as KERs to be assessed further.

There were no sightings of, or signs observed of the non-native mammal species recorded within the relevant grid squares of the Site of the Proposed Infilling. As such, these species will not be discussed further within this chapter.

5.10.6.4.3 Evaluation

Given the high suitability of the Site for a number of protected mammals, as well as a number of mammal signs identified at the Site, a number of mammal species have been earmarked as KERs and will be assessed further in this chapter. See Section 5.10.6.4.2 and *Table 5-10* for more information.

5.10.6.5 Amphibians

5.10.6.5.1 Desk Study Results

Common frog (*Rana temporaria*) has been recorded in the 10km (N40) grid square encompassing the Site.

There are no records for Smooth Newt (*Lissotriton vulgaris*) within any of the grid squares.

5.10.6.5.2 Field Study Results

During the Site walkovers, all drainage ditches on and adjacent to the Site, with the exception of the western-most (depicted on Figure 5-1), as well as several areas of standing water within the northeast of the Site were identified as suitable habitat for Amphibians. This is due to the varying water levels of the drainage ditches which contained several areas of standing/slow moving water and vegetated banks.

No sightings or signs of Amphibian were noted during either of the two amphibian surveys conducted on each walkover.

5.10.6.5.3 Evaluation

Although Common Frog were not identified during the Site walkover surveys, it cannot be concluded that this species is not utilising the Site, or will not move into the Site in the future given its presence within 10kms and the suitable habitat present within the drainage ditches in and around the site. As such, the species will be included for further assessment within this chapter.

As for Smooth Newt, the absence of the species within the 10km record and their lower tolerance for more acidic conditions provides confidence that the species are not utilising the Site, therefore this species will be ruled out from further assessment within this chapter.

5.10.6.6 Other Fauna

5.10.6.6.1 Common Lizard

No records of Common Lizard (*Zootoca vivipara*) exist for the relevant 10km grid square within the last 20 years. Given the fact that the majority of habitat on-site is cut over bog and bog woodland, which are inherently wet habitats intersected by drainage ditches it is unlikely there are significant dry, exposed areas on-site which are typically preferred for use by Common Lizard. As such, it can be assumed that Common Lizards are not utilising the Site and will be ruled out from further assessment within this chapter.

5.10.6.6.2 Crustaceans

White-clawed Crayfish (*Austropotamobius pallipes*) have been recorded within 10km of the Proposed Infilling Site within the last 20 years. Additionally, although unlikely, the western most drainage ditch could also support this species. White-clawed Crayfish are known to be present within the River Barrow which is hydrologically linked to the Site via the River Triogue. As such, impacts to White-clawed Crayfish cannot be ruled out at this stage and will be assessed as a KER later in this chapter under 'Fauna of the Barrow and Triogue Rivers'.

The Site lies within the Barrow catchment which is classified as a Freshwater Pearl Mussel (*Margaritifera margaritifera*) sensitive area due to the presence of this species within the River Barrow. Although there are no areas of suitable habitat on-site suitable for Fresh Water Pearl Mussel, the Site has a hydrological connection to both the Barrow catchment and the River Barrow. As such, impacts to Freshwater Pearl Mussel cannot be ruled out at this stage and will be assessed as a KER later in this chapter under 'Fauna of the Barrow and Triogue Rivers'.

5.10.6.6.3 Fish

There is only 1 record of a fish species presence within 10km of the Site (Stone Loach (*Barbatula barbatula*)). Additionally, there are no waterbodies on-site suitable which could support notable fish species such as Salmonoids or Lampreys. However, the Triogue River tributary lies only 0.225km south of the Site and could support such species. This River also hydrologically connects the Site to the River Barrow. As such, the fish assemblage of these waterbodies will be considered as part of this chapter under 'Fauna of the Barrow and Triogue Rivers'.

5.10.6.6.4 Marsh Fritillary (*Euphydryas aurinia*)

The Marsh Fritillary butterfly is protected under the Wildlife Act 1976 (as amended) and is also the only insect in Ireland that is listed on Annex II of the Habitats Directive.

Desktop survey results indicated records from 2021 of Marsh Fritillary within the 10km grid square which encompass the Proposed Infilling Site. No individuals of this species were recorded during the Site walkovers in December 2025 and January 2026, however three (3 no.) Devil's Bit Scabious (*Succisa pratensis*) individuals, the food plant directly associated with Marsh Fritillary, were recorded (within 150m of the Site boundary, see Figure 5-1).

Although no Marsh Fritillary have been observed at the Site, the site walkovers were undertaken outside of the recommended survey period for this species. Given this, coupled with the historical presence of the species in the vicinity and nearby presence of the species' food plant, a precautionary approach should be taken as to the presence of this species on the Site, as such Marsh Fritillary will be further assessed within this chapter as a KER.

5.10.6.6.5 Protected and/ or Notable Species unlikely to occur at the Site

Other notable and/or rare species and species listed on Annex IV of the Habitats Directive that were considered but that are unlikely to occur at the Site include:

- **Flora**
 - Marsh Saxifrage (*Saxifraga hirculus*) – Known populations only in Co. Mayo.
 - Killarney Fern (*Vandenboschia speciosa*) – Nearest known populations in Co. Wicklow, not recorded at the Site, no suitably sheltered, rocky and moist habitats available.
 - Slender Naiad (*Najas flexilis*) – A clear water, lowland lake species. No suitable habitat available at the Site.
- **Fauna**
 - Natterjack Toad (*Epidalea calamita*) – Distribution restricted to few coastal sites.
 - Kerry Slug (*Geomalacus maculosus*) – Distribution restricted to south and west of Ireland.

5.10.7 Evaluation of Ecological Features

Habitats have been evaluated for their conservation importance, based on the NRA evaluation scheme (NRA, 2009b). Those selected as KERs are those which are evaluated to be of at least local importance (higher value).

Development, or for which records exist in the wider area, have been evaluated for their conservation importance. This evaluation follows the Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009b).

The predicted impacts of the Proposed Development on the identified KERs are assessed in 5.12. Table 5-10 below summarises the evaluation rating assigned to each ecological feature and the rationale behind these evaluations is also provided.

Table 5-10: Evaluation of Designated Sites, Habitats, Flora and Fauna recorded within the Site and the surrounding area. Those identified as Key Ecological Receptors (KERs) are highlighted in green.

Species / Species Group	Evaluation	Rationale	Key Ecological Receptor (KER)
EUROPEAN SITES			
Slieve Bloom Mountains SAC (000412)	International Importance	No hydrological, hydrogeological, air, land or indirect pathways identified within accompanying AA Screening (Roger Goodwille & Associates, 2023)	No
Slieve Bloom Mountains SPA (004160)	International Importance	No hydrological, hydrogeological, air, land or indirect pathways identified within accompanying AA Screening (Roger Goodwille & Associates, 2023)	No
Mountmellick SAC (002141)	International Importance	No hydrological, hydrogeological, air, land or indirect pathways identified within accompanying AA Screening (Roger Goodwille & Associates, 2023)	No
River Barrow and River Nore SAC (002162)	International Importance	Potential indirect pathway identified via ex-situ habitat loss due to presence of Otter on-site. No hydrological, hydrogeological, air, land identified within accompanying AA Screening (Roger Goodwille & Associates, 2023).	Yes
Slieve Bloom Mountains Ramsar (335)	International Importance	No hydrological, hydrogeological, air, land or indirect pathways identified within accompanying AA Screening (Roger Goodwille & Associates, 2023)	No

Species / Species Group	Evaluation	Rationale	Key Ecological Receptor (KER)
DESIGNATED SITES			
Clonreher Bog NHA (002357)	National Importance	Direct air and indirect air pathways identified.	Yes
Dunamese Wood pNHA (001494)	National Importance	Potential hydraulic connection – downgradient of the site, although unlikely due to the nature of the Proposed Development and distance	Yes
Kilteale Hill pNHA (000867)	National Importance		
Ridge of Portlaoise pNHA (000876)	National Importance		
The Great Heath of Portlaoise pNHA (000881)	National Importance		
Derries Wood pNHA (000416)	National Importance	Potential indirect land pathway due to potential use of the Site by Pine Marten.	Yes
Emo Court pNHA (000865)	National Importance	No pathways identified	No
Rock of Dunamese (000878)	National Importance	No pathways identified	No
Shanahoe Marsh pNHA (001923)	National Importance	No pathways identified	No
Slieve Bloom Mountains pNHA (000142)	National Importance	Ruled out by proxy given the overlap with Slieve Bloom Mountains SAC (See Section 5.10.3)	No
Stradbally Hill pNHA (001800)	National Importance	No pathways identified	No
Timahoe Esker pNHA (000421)	National Importance	No pathways identified	No
HABITATS			
Cutover Bog (PB4)	Local Importance (Higher Value)	This habitat has a moderate degree of biodiversity and supports a range of floral species, which in turn provide foraging and nesting habitat for a range of fauna including small mammals and invertebrates. It is widespread within the area.	Yes

Species / Species Group	Evaluation	Rationale	Key Ecological Receptor (KER)
Bog Woodland (WN7)	Local Importance (Higher Value)	The bog woodland habitat on Site has potential to support species such as birds, bats, small mammals. It also has a good biodiversity of floral species. It is widespread within the area.	Yes
Dense Bracken (HD1)	Local Importance (Lower value)	This habitat has a low degree of biodiversity and provides some limited shelter for some fauna.	No
Drainage Ditches (FW4)	Local Importance (Higher Value)	Semi-natural habitat with relatively high degree of naturalness and biodiversity in local context. Likely to be of importance to locally occurring wildlife.	Yes
ADJACENT & LINKED HABITATS			
Adjacent Bog Woodland and Cutover Bog Mosaic Habitat	Local Importance (Higher Value)	The Site is surrounded along the north, west and south boundaries by more bog woodland and cutover bog habitats which are likely to support a variety of the same species supported by these habitats within the Site boundary.	
Adjacent Drainage ditches	Local Importance (Higher Value)	The drainage ditches within the Site extend beyond the boundary to the North and South of the Site. These are likely to share characteristics of the sections of drainage ditch within the Site boundary to support similar flora and fauna.	Yes
Triogue River	County Importance	The Triogue River is connected hydrologically and hydrogeologically to the Site via overland drainage and groundwater movement from the Site. This River is a tributary to the River Barrow. As such, it is likely to support a variety of riverbank and aquatic flora and fauna.	Yes
River Barrow	International Importance	The River Barrow is connected hydrologically to the Site via overland drainage and subsequent flow via the Triogue River. The River Barrow supports a variety of riverbank and aquatic flora and fauna, including a range of protected and rare species.	Yes
FLORA			

Species / Species Group	Evaluation	Rationale	Key Ecological Receptor (KER)
Rare & Protected Flora	Local Importance (Higher Value)	Although no rare or protected flora were recorded during the field surveys, a precautionary approach will be taken due to the fact that surveys were outside of the botanical survey season, and the historical presence of rare and protected flora within close vicinity to this Site.	Yes
Invasive Species	Local Importance (Higher Value)	Although no invasive flora were recorded during the field surveys, a precautionary approach will be taken due to the fact that surveys were outside of the botanical survey season, and the historical presence of Japanese Knotweed within 1km of this Site.	Yes
NATIVE FAUNA			
Bat Assemblage	Local Importance (Higher Value)	The Site is located in an area with medium Bat landscape suitability and field surveys confirmed the presence of highly suitable foraging and commuting habitat for Bats in and around the Site. There have also been a range of species historically recorded within the vicinity of the Site. A precautionary approach will be taken given the lack of bat activity surveys undertaken at the Site.	Yes
Breeding Bird Assemblage	Local Importance (Higher Value)	Breeding bird surveys were not carried out. Given this, coupled with the fact that the Site presents suitable nesting and foraging habitat, a precautionary approach will be taken in relation to the potential breeding bird usage of the Site.	Yes
Wintering Bird Assemblage	Local Importance (Higher Value)	Two wintering bird scoping surveys were carried out with two red and one amber listed species recorded (woodcock, meadow pipit, goldcrest) (see section 5.10.6.3.2). The data from the NBDC 10km grid square also indicates the local presence of a range of red and amber listed bird species (see section 5.10.6.3.1).	Yes

Species / Species Group	Evaluation	Rationale	Key Ecological Receptor (KER)
		The Site provides suitability for wintering birds in the form of cutover bog. Wintering birds are being brought forward as a KER due to the confirmed usage of the Site by amber and red listed bird species, and limited wintering bird survey data. Due to the shortfall in data, the precautionary principle has been applied, and the Site is assumed to be of local importance (Higher Value) for wintering birds.	
Otter	Local Importance (Higher Value)	Site visits confirmed use of the Site by Otter, as well as the presence of suitable habitat in the form of drainage ditches with vegetated banks.	Yes
Badger	Local Importance (Lower Value)	No evidence of Badger was observed. Additionally, and although the cutover peat and bog woodland is not considered optimal habitat for Badger. Whilst , it is not impossible that the species could utilise it, particularly for foraging and commuting through and the Badger have been recorded within the 10km grid square surrounding the Site., there is especially given the presence of adjacent an abundance of agricultural land with hedgerow boundaries to the east which the species are much more likely to utilise, and given that the Site does not connect to additional optimal habitat	No
Red Fox	Local Importance (Lower Value)	Although Red Fox likely utilise the Site, this species are not legally protected.	No
Irish Hare	Local Importance (Higher Value)	Irish Hare are found within a range of habitats including bog habitats such as those present within the Site, or agricultural lands which are also present within the vicinity of the Site. Although no signs or individuals of these species were observed, the species have been historically recorded within the 10km grid square surrounding the Site, and there is an abundance of heather on-site which could be used for breeding.	Yes

Species / Species Group	Evaluation	Rationale	Key Ecological Receptor (KER)
		Given that the surveys were undertaken out with the hare breeding season, the precautionary principle has been applied, and the Site is assumed to be of local importance (Higher Value) for Irish Hare.	
Pine Marten	Local Importance (Higher Value)	The Site has potential to support Pine Marten due to the presence of mature coniferous and deciduous trees within the Bog Woodland habitat. Although no signs of this species were identified, the presence of suitable habitat for nesting and foraging and historical presence of individuals within the vicinity of the Site supports the conclusion that the Site is of local importance (Higher Value) for Pine Marten.	Yes
Red Squirrel	Local Importance (Higher Value)	The Site has potential to support Red Squirrel due to the presence of coniferous and deciduous trees within the Bog Woodland habitat. Although no signs of this species were identified, the presence of suitable habitat for nesting and foraging and historical presence of individuals within the vicinity of the Site supports the conclusion that the Site is of local importance (Higher Value) for Red Squirrels.	Yes
Small Mammals (including European Hedgehog, Irish Stoat and European Pygmy Shrew)	Local Importance (Higher Value)	The Site has potential to provide suitability for small mammals, which have historically been recorded within the area, such as the hedgehog and pygmy shrew, in the form of scattered areas of scrub habitat within the cutover bog and bog woodland.	Yes
Amphibians	Local Importance (Higher Value)	Common Frog present within 10km and suitable habitat present within the drainage ditches in and around the site.	Yes
Reptiles	Local Importance (Lower Value)	Due to the lack of suitable habitats/features on Site such as stonewalls, the Site is deemed unsuitable to support a significant population of the common lizard. The majority of the Site is made up of wet	No

Species / Species Group	Evaluation	Rationale	Key Ecological Receptor (KER)
		bog habitats which are an unfavourable habitat to this species.	
<u>Fauna of the Barrow & Triogue River:</u> White clawed crayfish Freshwater Pearl Mussel Fish Assemblage	Local Importance (Higher Value)	Limited suitable habitat present within the Site, however, may be present in the River Triogue, which is hydrologically linked to the Site.	Yes
Marsh Fritillary	County Importance	Surveys to identify the presence of Marsh Fritillary individuals or larval webs have not been carried out. Given this, coupled with the fact that this species have been recorded as being historically present within 10km, and the Site contains suitable habitat including the species' feeding plants, a precautionary approach will be taken in relation to the Marsh Fritillary usage of the Site.	Yes

5.11 Characteristics of the Proposed Development

The Proposed Development comprises the importation of material to in-fill and re-contour the site, which represents the operational stage of the Proposed Development. It comprises the importation of excavated inert soil and stone arising from local greenfield residential development sites in Portlaoise. The applicant proposes, subject to the grant of permission, to import inert soil and stone (by-product) to remediate approximately 2.52 hectares of the total site. On completion, the lands will be recontoured to a maximum finished height of 2.6 metres with an average infill depth of 1.9 metres. All finished ground levels will remain below the adjoining Local Primary Road L-2217. The infilling of soil and regrading of land will support future agricultural activity, potential forestry, amenity use, or other appropriate land uses within these low-lying lands, which represents the intended end use of the Proposed Development.

5.11.1.1 Construction Phase

The construction phase of the Proposed Development is anticipated to last a duration of 5 days and will require the clearance of majority self-seeded trees and vegetation across the site, together with a series of enabling works to prepare the area for the subsequent infilling and regrading operations. The roadside boundary hedge on the northern and eastern sides of the site will require partial removal as necessary to facilitate sightlines and access. As the land parcel is comprised of cutover bog, there is no defined internal hedge-line or fenceline. Upon first establishing and delineating the registered boundary, any trees or planting along the boundary will, where possible, be retained.

These preparatory works will also include the installation of temporary site fencing, the establishment of buffer strips to adjoining lands, the protection of existing site drainage infrastructure, the construction of a Temporary Construction Compound (TCC), and the formation of the site access, including road widening works.

The location of all drainage features will be identified and surveyed prior to commencement for record and maintenance purposes, and all existing drainage ditches and bog drains will be retained.

The construction phase will include the establishment of a TCC, approximately 11.5 m² in size, as shown on Figure 2-5. The TCC is expected to accommodate a temporary modular building which will be used for site offices, monitoring of incoming vehicles, and welfare facilities, including toilets with sealed waste storage for off-site removal. It will also provide parking for construction staff, visitors, and construction vehicles, secure storage for tools and small parts, a small reception area, and a fuelling point or mobile fuel bowser operated in accordance with CIRIA best-practice guidelines. The TCC will be in use for the duration of the operational infilling stages.

Welfare facilities will be provided for the full duration of the construction and operational period. These facilities will include provisions for waste management, refuelling, power supply, potable water, and the safe storage of chemicals and materials. The TCC will be formed by stripping and regrading the topsoil, followed by the installation of a geotextile membrane and a layer of imported stone. The stripped topsoil will be stored adjacent to the compound within a linear bund typically no greater than 2 m in height. Superficial soil will be stripped and stored separately from the topsoil, and will be stored in a similar manner, subject to the volume of material requiring excavation. Uncontaminated surface run-off from the compound will be directed to a swale or infiltration area to prevent discharge to the existing drainage ditch. All other run-off from the wider site will continue to follow existing natural drainage patterns and newly installed drainage routes.

Upon completion of the operational phase (as detailed in Section 2.4 Phase 4 (Completion Stage)), the compound area will be reinstated. Reinstatement works will include the removal of imported granular material and the underlying geotextile, the gentle ripping of the exposed substrate, and the replacement of the stored superficial soil and topsoil. The surface will then be re-seeded as required. Where ground conditions allow, inert materials such as the imported stone may be retained in place, with reinstatement achieved through the replacement of stored soils. In these circumstances, the area would be kept on record and could be reused as the Temporary Construction Compound during any future decommissioning phase.

Welfare facilities will comply with the Health and Safety Authority (HSA) Requirements for Construction Site Welfare Facilities (2017). Facilities will include mobile toilets and/or self-contained welfare cabins with sealed waste storage, with all sewage waste collected and tankered off-site by a licensed waste contractor. Potable water will be provided in the form of bottled water for drinking and messing purposes, while welfare units are likely to incorporate built-in water bowsers for sanitation. Electricity will be supplied by on-site generators.

5.11.1.2 Surface Water Drainage

As documented in the OCEMP (Lenztech, 2023), good practice construction techniques would be adopted for the management of sediment and surface water runoff generated during the construction phase of the Proposed Development.

The new surface water drainage collection network will be provided at commencement (i.e., during the construction phase of the Proposed Development) with the installation of the SuDS measures. Any surface water discharge will be via the bypass separator (i.e., catchpit manholes) with an integrated silt collection chamber for disposal to ground onsite via a soakway (i.e., an infiltration trench sized in accordance with BRE Digest 365 Soakaway Design). In addition, sumps of approximately 600mm depth, within manhole chambers will serve as silt traps to manage siltation with optional use of strainers within the pipe network and manholes during seasonal weather conditions in order to reduce the silting effects of these particles in the network. Runoff from areas of exposed soil will be intercepted by a silt containment barrier installed as good practice in advance of the drainage feature.

Uncontaminated surface runoff from the compound (TCC) will be directed to a swale or infiltration area constructed during the construction phase, to prevent discharge to the existing drainage ditch. The swale will be located at the perimeter of the compound area and will be a wet swale, with runoff infiltrating to ground (i.e., to the existing subsoil). All other runoff from the wider site will continue to follow existing natural drainage patterns and newly installed drainage routes as established above.

5.11.1.3 Foul Drainage

As documented in the Planning Application form, there will be no more than 1-2 people (i.e., delivery driver and plant operator) at the site at any one time. Therefore, temporary welfare facilities, where provided, will have a waste collection company.

As documented in the OCEMP (Lenztech, 2023), a combination of a temporary portaloo and an onsite welfare facility cabin with self-contained toilet and washing facilities will be provided for site personnel. No onsite wastewater treatment system or connection to the public mains is required. Effluent and waste from temporary onsite welfare facilities would be maintained, collected and tankered offsite by a contracted licenced waste contractor.

5.11.1.4 Operational Phase

A Maximum of 50,250 cubic metres equating to approximately 85,000 tonnes of inert soil and stone shall be imported over a period of approximately 5 years. Importation will be limited to 17,000 tonnes per annum. In addition, a total of 87m³ (150 tonnes) of material will be reused on site from the site preparation stage.

All fill material will comply with Article 27 of the European Communities (Waste Directive) Regulations 2011. The material to be imported meets the criteria for classification as a by-product under Regulation 27 of the same Regulations. No processing of waste is required on site; only clean soil and stone will be brought to site, managed through sampling and testing at the origin. Material classification will follow the TII Specification for Road Works (2024) for Earthworks Materials. Anticipated typical imported materials include Class 5A topsoil, Class 1 general granular fill, Class 2 general cohesive fill and Class U1 non-hazardous material. The proposed infill materials will offer permeability typical of greenfield run-off rates and standard percentage run-off values for soil, reflecting existing drainage patterns. The applicant intends that all material will be sourced locally within a 10 kilometre radius of serviceable zoned development lands in Portlaoise, where the applicant is contracted to provide civil engineering works for residential construction. The Applicant is currently engaged in a number of construction projects within Portlaoise, from which suitable material may arise.

In terms of phasing, It is envisaged that the low lying lands will be infilled from an east to west direction allowing the lands to be trafficked from east to west without the requirements for excessive haul roads to the extreme western boundary. Material will be graded in 200-250mm thick layers to the identified finished levels through the use of suitable plant and equipment such as a 360deg excavator and a track dozer.

A 10-meter buffer will be maintained along the western boundary of the site where no soil importation shall take place to retain the cover of birch and willows.

The sequence of infilling works will be undertaken on a phased basis. The phasing plan comprises four (No. 4) phases, as outlined below.

Phase 1 (Phase 1a and Phase 1b)

Phase 1 will consist of regrading works within the eastern portion of the site. Approximately 25,550 m³ of soil and stone material (33,215 tonnes) will be placed during this phase.

Material will be temporarily stockpiled adjacent to the temporary permeable granular unloading area for subsequent regrading. Temporary silt-containment barriers will be installed at all identified bog drains to protect downstream watercourses.

Phase 2

Phase 2 will involve regrading works in the central portion of the site. Approximately 22,250 m³ (28,925 tonnes) of material will be placed during this phase.

The area previously infilled during Phase 1 (eastern section) will be regraded and recontoured, followed by additional infilling within the Phase 2 area.

Phase 3

Phase 3 will comprise regrading works within the western portion of the site. Approximately 18,200 m³ (23,660 tonnes) of material will be placed during this phase.

The area infilled during Phase 2 will be regraded and recontoured during this phase, with infilling undertaken thereafter. The temporary haul route will be extended progressively to facilitate the regrading works.

Phase 4 (Completion Stage)

Phase 4 will comprise the completion and final recontouring of the site. The western area infilled during Phase 3 will be regraded and recontoured to achieve the final landform.

Upon completion of the regrading works, the temporary haul route and all associated granular material will be fully removed.

The re-profiling of the surface will be carried out to allow for the planting of native grassland and will be supervised by a qualified landscape architect to ensure that the filling is carried out in a manner that will derive maximum benefit from this

5.12 Potential Impact of the Proposed Development

5.12.1 Avoidance and Mitigation Embedded in Project Design

The Proposed Development includes embedded design features that may act to avoid or mitigate negative impacts that would likely occur in the absence of these features. However, as opposed to typical mitigation measures, the implementation of these features is integral to the design and completion of the Proposed Development, and as such the impact assessments are performed with consideration of these features as integrated parts of the Proposed Development. All considered embedded design features that may act to mitigate negative impacts on local ecology and environment are listed in *Table 5-11*.

Table 5-11: Embedded design features and their potential to act to avoid or mitigate negative impacts on the local ecology and environment

Embedded Design Feature	Avoidance / Mitigation Potential
Construction phase SUDS: • Silt trap • Soak away.	The SUDS features included in the Project Design will ensure the surface water discharge from the widened access road is captured and treated within the silt trap and bypass separator. These features will be implemented as part of the surface water drainage design during the construction phase (infilling phase). The implementation of SuDs for the Proposed Development will allow surface water to infiltrate to ground (though infiltration capacity is limited) via a soakaway during the construction and operational phase of the Proposed Development, retaining surface water runoff and therefore, reducing the level of runoff discharging to the onsite ditches.
Operational phase landscaping: • 10m buffer of natural habitat retained • 1m Bog woodland or cutover bog boarders retained around site periphery • Planting of native cuttings from site around perimeter at depth of 5m	Vegetation clearance and infilling avoided within 10m buffer which surrounds only outflowing drainage ditch on the site. Avoids habitat loss within a small area of the Site and buffers impacts to adjacent/ linked habitats and receptors as a mitigation. Natural regeneration of woodland around edge of site encouraged
OCEMP • Vegetation to be cleared east to west	Allows for wildlife which may be present within vegetation to retreat safely during works.

5.12.2 Construction Phase

5.12.2.1 Impacts on Designated Sites

5.12.2.1.1 River Barrow and River Nore SAC

As discussed in Section 5.10.2, signs of Otter, a QI species of the River Barrow and River Nore SAC, were identified utilising the drainage ditch habitat adjacent and linked hydrologically to the Site. This River Barrow and River Nore SAC is connected to the Site of the Proposed Development via the Triogue River which connects after approximately 10km. Given the long ranges which Otter may traverse, this presents a risk that the construction vegetation clearance at the Site could result in ex-situ habitat loss for the species.

However, no holts were found on-site, and the Site is not functionally important to the SAC given this distance of 10km and the ample available vegetated banks and aquatic habitats available for Otters to utilise in between the Site and SAC (along the Triogue river). As such, use of this Site by Otters associated with this SAC is likely to be occasional only. In addition to this, the Otter signs were noted within off-site adjacent drainage ditch habitat only, which is to be retained. As such, impacts to the River Barrow and River Nore SAC are deemed **as negative, imperceptible, medium term** on an international scale.

5.12.2.1.2 Clonreher Bog NHA

As discussed in Section 5.10.3.1.3, the construction phase of the Proposed Development will include disturbances to soil on the Site, this could introduce dust to the vicinity surrounding the Site which, according to Air Quality Management (IAQM) Guidance on the Assessment of Mineral Dust Impacts for Planning (IAQM, 2016), could travel up to 400m via the identified air pathway. However, this upper limit represents fine dust material which is not expected to be produced at this Site, additionally, following field visits as well as a desk study of the lands separating this NHA from the Site, it is evident that there is a sufficient buffer of suitably tall vegetation which will act to prevent the transfer of dust along this 400m pair pathway. As such, this direct air pathway can be ruled out, hence this represents a **neutral, imperceptible, short-term** impact on a national scale.

5.12.2.1.3 Dunamese Wood, Rock of Dunamese, Kilteale Hill, Ridge of Portlaoise pNHAs

A potential direct hydrogeological pathway to the closest pNHA, Ridge of Portlaoise pNHA, as well as further afield Dunamese Wood, Rock of Dunamese, Kilteale Hill, was identified. Whilst the closest of these pNHAs is within range of the hydrogeological flow of the groundwater body within the area, this possible hydrogeological pathway is intersected by the Triogue River flowing west to east. Therefore, although it would normally be considered a possibility that groundwater from the Site could travel this distance, it is ruled out in this instance due to the nature of the ground water body in that it will discharge top flows into waterbodies which in this case will carry any water from the Site away from the designated Sites, and all others in this direction. As such, the hydrogeological pathway to this pNHA, as well as Rock of Dunamese, Kilteale Hill, Ridge of Portlaoise pNHAs site can be ruled out and deemed imperceptible.

5.12.2.1.4 Derries Wood pNHA

An indirect land pathway to the Derries Wood pNHA was identified given the potential of the Site to provide ex-situ habitat for Pine Marten. Impacts via this pathway are assessed under Section 5.12.2.3.6 and Section 5.12.3.3.6.

All other impacts of the Proposed Development on this Site are deemed **imperceptible**.

5.12.2.2 Impacts on Habitats and Flora

5.12.2.2.1 Cutover Bog (PB4)

During the construction phase, the majority of this habitat is proposed to be removed to facilitate the later infilling activities. For cutover bog habitat to form, peat builds up over thousands of years, before it is cutover and disturbed. Therefore, although the Site will be infilled with regraded topsoil and imported soil and left to re-naturalise, this habitat will not be recreated due to the fact that imported substrate is not peat, but a soil mix. It is important to note, however, that there is a large area of this habitat surrounding the Site and the habitat itself has already undergone some level of disturbance. Hence, the removal of this habitat and

subsequent loss of its established floral biodiversity is deemed to have a **negative, slight, permanent** impact on a local scale

In addition to the above impact, a small area of cutover bog habitat will remain within the 10m buffer in the west of the Site, as well as around the periphery. Construction phase related traffic and vegetation removal and soil preparation activities in close proximity to the flora within this buffer may place them at risk of damage to their above ground growth through dust transfer. This represents a potential **negative, moderate, short-term** impact on a local scale.

The remaining cutover bog habitat also remains at risk of damage via the transfer of pollution which could leak from such machinery. These impacts would result in persisting effects on the flora and habitat. This represents a potential **negative, moderate, short-term** impact on a local scale.

5.12.2.2.2 Bog Woodland (WN7)

During the construction phase, the majority of this habitat is proposed to be removed to facilitate the Proposed Infilling activities. Again, a distinctive feature of this habitat is the cutover bog substrate which supports the woodland, this is the remains of a pre-existing, slow forming deep acid peat substrate that has been disturbed and partially removed. Therefore, although the Site will be infilled with regraded topsoil and imported soil and left to re-naturalise, this habitat will not be recreated due to the fact that imported substrate is not peat, but a soil mix. It is important to note, however, that the habitat itself has already undergone some level of disturbance, in addition to this, there is a large area of the same habitat of equal quality common within the adjoining landscape, and give the location of the Site adjacent to the road intersections, the overall connectivity of this wider habitat is not altered. Hence, the removal of this habitat and subsequent loss of its established floral biodiversity is deemed to have a **negative, slight, permanent** impact on a local scale.

Although the majority of bog woodland will have been lost, a small area will remain within the 10m buffer in the west of the Site as well as around the periphery. Construction phase related traffic and vegetation clearance activities in close proximity to the trees within this habitat that are directly adjacent to this 10m buffer may place them at risk of damage to their root protection zones, which could ultimately damage or destroy trees within this habitat. This is a particular concern within this habitat as the movement of soils may encroach easier and prevent floral species from photosynthesising, causing damage or death to the plants. This represents a potential **negative, significant, short term** impact on a local scale.

Vegetation clearance and soil preparation activities ongoing adjacent to the remaining bog woodland on-site could also release dust onto these remaining bog woodland areas and cause physical damage to above ground growth of flora. This represents a potential **negative, moderate, short term** impact on a local scale.

Finally, remaining bog woodland habitat also remains at risk of damage via the transfer of pollution which could leak from such machinery, polluting the soils and causing damage and death to floral communities. These impacts would result in persisting effects on the flora and habitat. This represents a potential **negative, moderate, short term** impact on a local scale.

5.12.2.2.3 Drainage Ditches (FW4)

As for the western most drainage ditch, which, as described in Section 5.10.4.4 is wider than others and has permanent flow, the construction phase could bring about loading on the

existing surface which will first cause the compression of any air spaces in the underlying peat, and later cause possible peat movement into any unstable sections of the ditch. There is also a risk that vegetation removal, vehicle presence and soil preparation activities could introduce surface water discharges containing construction phase pollutants into the ditch (e.g., silt and sediments, cementitious materials used for fencing, hydrocarbons, soils from infilling deliveries, dust, etc.) via overland or groundwater flow. Given that the project design has embedded a vegetation 10m buffer of cutover bog flora and bog woodland to remain, which extends around this western most drainage ditch and stabilises the soil, impacts arising from soil compaction are not expected to occur. However, given that this buffer is only 10m, there still remains a possibility that construction phase pollutants could enter via groundwater or surface water flow. As such, pollution impacts to the western most drainage ditch are deemed to be **negative, significant, short term** impact on a local scale.

It is also a possibility that clearance and soil preparation activities in close proximity to the remaining drainage ditch could result in the transfer of dust via the air into this habitat and contaminate the water. Although some protection will be provided by the 10m buffer, a precautionary approach will be taken owing to the varying height of the flora present. As such, this represents a potential **negative, moderate, short term** impact on a local scale.

All other drainage ditches on-site, with the exception of the western most ditch, are to be cleared of vegetation and infilled with clean washed Clause 6A material with no fines or dust particles, which shall allow water to flow through it in all directions. Whilst this retains the function of the drainage ditch as an outlet of water from the Site, the habitat will effectively be lost due to the closing and loss of open air access to the linear, waterbody/ wet channel, removing its capacity to support wetland vegetation and associated fauna. Despite this, it should be noted that an additional drainage habitat will remain intact throughout the Sites surrounding areas. Hence, the removal of this habitat and subsequent loss of its established floral biodiversity is deemed to have a **negative, slight, permanent** impact on a local scale .

5.12.2.2.4 Adjacent Bog Woodland & Cutover Bog Mosaic Habitat

Given that this habitat lies outside of the Site boundary, this will not be removed as part of this application. However, vegetation clearance and soil preparation activities ongoing adjacent to the northern or southern border of the Site may place these areas of bog woodland and cutover bog at risk of damage via a number of mechanisms. For example, Driving of vehicles within close proximity to areas of bog woodland habitat presents a risk of damage to tree root protection zones and could cause physical damage to their above ground growth, which may result in persisting adverse effects on the trees. This represents a potential **negative, significant, short term** impact on a local scale.

Additionally, vegetation clearance and soil preparations may release dust on to these habitats. This could interfere with photosynthesis, causing damage or death to the plants. This represents a potential **negative, moderate, short term** impact on a local scale.

Vehicles on-site also present a risk of pollution; spills of fuel or lubricants could inadvertently leak from such vehicles and encroach into these adjacent habitats, polluting the soils and causing damage and death to floral communities. This represents a potential **negative, moderate, short term** impact on a local scale.

5.12.2.2.5 Adjacent Drainage Ditches

Given that this habitat lies outside of the Site boundary, this will not be removed as part of this application. However, vehicle presence and soil infilling and recontouring activities may introduce surface water discharges into the adjacent ditches containing construction phase pollutants (e.g., silt and sediments, hydrocarbons, soils from infilling deliveries). These have the potential to enter the adjacent drainage ditches directly via surface water flow, and even travel downstream where drainage ditches present flow, thus have the potential to cause water quality deterioration within the drainage ditch habitats adjacent to the Site. The likelihood of this occurrence and subsequent negative impacts to flora and fauna within the adjacent habitat represents a potential **negative, significant, short-term impact** on the water quality of the adjacent drainage ditches on a local scale.

Additionally, vegetation clearance and soil preparations may release dust on to these habitats. This could interfere with photosynthesis, causing damage or death to the plants. This represents a potential **negative, moderate, short term impact** on a local scale.

In addition to the above impact, the construction phase could bring about loading on the installed infill materials within the drainage ditches on-site which could cause the compression of any air spaces in such filter installations and could later cause compaction and impediment of water flow into this habitat, or cause possible peat and soil movement into any unstable sections of the drainage ditch habitats adjacent to the Site, consequently disturbing the habitat. This represents a potential **negative, significant, short-term impact** on a local scale.

5.12.2.2.6 Triogue River

As outlined in Section 5.12.2.2.3 and 5.12.2.2.5, any works within the on-site drainage ditches, or near the adjacent drainage ditches may introduce surface waters or groundwaters which contain construction-related pollutants into these habitats (e.g., silt and sediments, hydrocarbons, soils from excavations, dust, etc.). Whilst the majority of the drainage ditches do not have a hydrological connection to the Triogue River, the western most drainage ditch presents a clear southerly flow path and its connection to the Triogue River cannot be ruled out. Hence, although unlikely due to the 10m buffer of intact vegetation which separates the construction works from the drainage ditch, contaminants from the site still have the potential to travel into the Triogue via the western most drainage ditch and thus have the potential to cause water quality deterioration within the Triogue River.

It should also be noted that the L2117 road which will be used by the vehicles transporting soil to the Site slopes towards the Triogue river, it is possible that soil transported openly within these vehicles, or soil transported from the Site via vehicle tyres could also reach the River Triogue, again, adding contaminant load.

Given this, and the fact that flow within the western ditch was observed during the field surveys, the likelihood of contaminants reaching the Triogue River and subsequently negatively impacting flora and fauna within the habitat represents a potential **negative, significant, short-term impact** on the water quality of the Triogue River.

It is also a possibility that clearance and soil preparation activities in close proximity to the remaining drainage ditch could result in the transfer of dust via the air into the connecting drainage ditch and contaminate the water and subsequently enter the Triogue. Although some protection will be provided by the 10m buffer, a precautionary approach will be taken owing to

the varying height of the flora present. This represents a potential **negative, moderate, temporary impact** on a local scale.

5.12.2.2.7 River Barrow

A direct hydrological pathway to the River Barrow has been identified, as pollutants arising from construction activities, sediment and contaminants have the potential to travel downstream via the western drainage ditch and subsequently the Triogue River where they could reduce water quality of this habitat resulting in negative impacts on fauna present. However, given the installation of the 10m buffer at the Site to reduce such impacts, as well as the significant distance between the Site and the Triogue which will sufficiently dilute any such release to in-significant levels, it is deemed that such impacts on the River Barrow from the Proposed Development will be **neutral, imperceptible, and short term** at a local scale

5.12.2.2.8 Rare & Protected Flora

The majority of on-site habitats within which rare and protected flora could be present are scheduled for clearance during the construction phase. Loss of these species represents a **negative, significant, long-term impact**. Additionally, small areas of vegetation set to be retained within the 10m buffer strip and vegetative boarder could still support such species; construction activities such as the driving of vehicles across the Site as well as the tipping of clearance of vegetation have the potential to introduce dust and pollutants via air or hydrological pathway into these remaining areas which could in-turn damage or destroy rare or protected floral species. Such an instance represents a potential **negative, significant, long-term impact** on any rare and protected flora which may still be present on-site

Given that the majority of on-site habitats are scheduled for removal during the construction phase, there remains a possibility that un-identified rare or protected floral species could be destroyed or damaged during vegetation clearance. Such an instance represents a potential **negative, significant, long-term impact** on any rare and protected flora present on-site.

5.12.2.2.9 Invasive Species

Although no invasive species were identified during site surveys, these were not undertaken within the botanical surveys season, and an unknown length of time will elapse before construction where such species could colonise (this is not unlikely given the fact that Japanese Knotweed has been recorded within 1km of the Site previously). Construction activities at the Site will involve the mechanical excavation and removal of vegetation from the Site. This presents a risk of any invasive species spread. Where cleared areas are not replanted within the same botanical season, there is high potential for resprouting of the invasive species at the Site. Additionally, construction vehicles and workers may inadvertently spread invasive species within the Site and/or to the surrounding landscapes on e.g., wheels or boots if driving or walking over cuttings and seeds. As such, in the absence of proper mitigation measures, this risk represents a potential **significant, negative, long-term impact** on a local scale.

5.12.2.3 Impacts on Native Fauna

5.12.2.3.1 Bat Assemblage

The vegetation clearance of a proportion of the bog woodland habitat during the construction phase of the Proposed Development presents a risk of injury or death to bat assemblages which may use the Site for daytime roosting. Although no PRFs were identified onsite and there was an absence of trees with crevices suitable for supporting roosting bats, the timing

of construction clearance could be such that new crevices are able to form and roosting bats can move in. Clearance of trees containing roosting bats can cause bat death or injury. As such, this represents a **negative, short-term, significant** impact at a local level in the absence of further mitigation.

The Site is also located in an area with medium Bat landscape suitability and has been determined to be highly suitable foraging and commuting habitat for Bats in and around the Site. There have also been a range of species historically recorded within the vicinity of the Site.

Whilst the construction phase will oversee the clearance of a proportion of the bog woodland habitat which will result in the loss of some foraging and commuting habitat, it should be noted that the Site will be returned to a semi natural landscape following the operational phase, through seeding of native grass across the majority of the area. Additionally, throughout both phases, 1m of vegetative borders, including some bog woodland are to be retained around the boundary of the Site where much of the bog woodland habitat is already situated. Planting of a 5m boarder of native woodland will also occur following recontouring. Bats will continue to be able to access this 'new' treeline throughout construction (provided lighting impact is mitigated, see below), this will maintain connectivity between adjacent commuting and foraging lands, particularly due to the fact that the construction phase also does not introduce large obstructions on-site such as overnight machinery or the erection of significantly large buildings. Additionally, the Site is relatively small in comparison to the wider landscape which will continue to support foraging and commuting bats throughout the construction phase. Given the above information, and in the absence of compensation, the impact of the removal of this foraging and commuting habitat will be **negative, slight, long-term** to local foraging and commuting bats .

Construction Phase lighting could potentially have a negative impact on local bat populations using the remaining suitable habitats in and around the Site, as most bat species avoid strongly lit areas when foraging and/or commuting. If construction lighting is directed to the high suitability treelines which remain at the edge of bog woodland habitat parcels within and around the Site (Figure 5-1), it is possible for it to disrupt commuting routes of local bats. As such, in the absence of precaution and wildlife considerate lighting during construction, this risk represents a potential **negative, moderate, short-term** impact on the local bat assemblage.

5.12.2.3.2 Breeding Bird Assemblage

The loss of habitats that the potential breeding bird assemblage on Site may utilise, such as the scrub within the cutover bog and bog woodland areas, is not considered to result in a significant impact on local bird species. The surrounding areas provide similar areas of habitat and the 5m of native tree border planting following completion of infilling will provide compensation for some of the lost woodland habitat. Additionally, the riparian edges close to the larger drainage ditch will remain in place throughout the project, and the infilled land will be re-seeded using a native grassland mix which, once left to grow could provide tussocks suitable for some ground nesting birds. Therefore, the loss of habitats will result in a **negative, significant, short-term** impact on the local breeding bird assemblage, during construction and establishment of habitats.

A handful of bird species were recorded utilising the bog woodland and cutover bog habitat within and around the Site, with ground nesting meadow pipit and gold crest also recorded

within the winter scoping surveys. Given this, as well as the fact that no breeding bird surveys have been undertaken, a precautionary approach will be taken and significant usage of the Site by a range of breeding birds (some red and amber listed) will be assumed. Should vegetation be cleared as part of the Construction Phase during the breeding bird season (March 1st to August 31st); there is the potential for nesting birds to be harmed and nests to be destroyed. This would be in contravention of the Wildlife Act 1976 (as amended) which provides protection to breeding bird species and their nests and young. Therefore, in the absence of any mitigation or precaution, this risk represents a potential **negative, significant, short-term** impact on breeding birds at a local scale.

The increased human presence, noise and dust levels associated with the Construction Phase of the Proposed Development may have the potential to cause disturbance impacts to local breeding bird populations, particularly any birds within the remaining vegetation around the Site or in the adjacent bog woodland and cutover peat habitat. There is also potential for disturbance from lighting associated with the Construction Phase of the Proposed Development, as lighting may need to be left on over-night to provide security. Night-time lighting has been shown to negatively affect birds. For example, a study carried out by Ouyang et al. (2015) found that great tit (*Parus major*) individuals nesting under white light had higher corticosterone (stress hormone) levels than individuals nesting under green light or in darkness. The research also found that birds nesting under red light had higher corticosterone levels when they nested closer to the lamppost than individuals nesting farther away. Furthermore, the study also found that high corticosterone levels were correlated with lower fledgling numbers. Considering the above, and in the absence of appropriate Site management and mitigation, disturbance from Construction-related increases in noise, dust and lighting is considered to have the potential to cause **negative, significant, temporary** impacts on local bird populations.

5.12.2.3 Wintering Bird Assemblage

The bird scoping surveys recorded red listed bird species including woodcock and meadow pipit on-site, as well as patches of suitable habitat for a small number of wintering birds such as Common Snipe in the form of cutover bog habitat with scattered trees and scrub, as well as the less dense areas of bog woodland habitat with scrub undergrowth. Having said this, the Site is unlikely to hold larger wintering flocks of such species due to the fragmentation of suitable habitat types present and its overgrown and enclosed nature. Woodcock were recorded within the wetter riparian areas adjacent to the drainage ditch, and although the riparian buffer is set for retention, the Site held additional wet woodland areas that may be suitable for the species. As for Meadow Pipit, areas of suitable habitat were also scattered around the Site, however, the surrounding landscape provides an alternative large area of suitable winter bird habitats and will remain accessible by displaced species throughout the construction phase. Although no surveys have been undertaken to confirm that this surrounding suitable habitat has capacity to support the individuals within the Site, this is not thought to be an issue given the relatively small size of the Site in comparison to the wider area of suitable habitat, as well as the fact that the operational phase will see boarder tree planting as some partial compensation for habitat lost. Despite this, given that a precautionary approach is being followed in cognisance of the lack of winter bird survey data, the potential impact from the loss of habitats on the woodcock and other possible wintering bird populations considered to be **negative, significant, short-term** at the local level.

The increased human presence, noise and dust levels associated with the Construction Phase of the Proposed Development may have the potential to cause disturbance impacts to local wintering bird populations, particularly any birds within the remaining vegetation around the Site or in the adjacent bog woodland and cutover peat habitat. There is also potential for disturbance from lighting associated with the Construction Phase of the Proposed Development, as lighting may need to be left on over-night to provide security. Night-time lighting has been shown to negatively affect birds. For example, a study carried out by Ouyang et al. (2015) found that great tit (*Parus major*) individuals nesting under white light had higher corticosterone (stress hormone) levels than individuals nesting under green light or in darkness. The research also found that birds nesting under red light had higher corticosterone levels when they nested closer to the lamppost than individuals nesting farther away. Furthermore, the study also found that high corticosterone levels were correlated with lower fledgling numbers. Considering the above, and in the absence of appropriate Site management and mitigation, disturbance from Construction-related increases in noise, dust and lighting is considered to have the potential to cause **negative, significant, temporary** impacts on local wintering bird populations.

Additionally, should construction and vegetation clearance works take place during the winter between November and April, there is a risk of **significant, negative, short-term** disturbance and potential injury on the local wintering bird populations, particularly woodcock which flush out of hiding only at close range.

5.12.2.3.4 Otter

Although no holts were present onsite or its surroundings during the walkover, it is possible that Otter could move in from the surrounding suitable habitats and form new holts on-site or within 150m of the boundary during the time which elapses preceding commencement of vegetation clearance. Inadvertent vegetation clearance atop or close to a holt could cause disturbance, injury or death to Otters. As such, this represents a **negative, significant, long term** impact at a local scale.

Direct removal of the commuting and foraging habitat present on-site could reduce the availability of food sources and access to wider water networks, causing negative impacts to the species. However, the drainage ditches on-Site set for removal are not suitable for Otter, and the western drainage ditch, which is set to be retained, will be protected with a buffer of retained vegetation throughout the works. In addition to this, Otters have a wide commuting and foraging range, particularly in comparison to the relatively small size of this Site. Given the abundance of drainage ditch, stream and river habitat within the vicinity of the site, as well as accessible further afield within the Triogue River and River Barrow, it is expected that the Otters will have access to ample alternative commuting and foraging habitat to naturally retreat to following the commencement of the construction phase. Additionally in research carried out in 2023/2024 otters have been shown to be negatively associated with peatland areas generally, preferring larger and fast flowing river channels (Reid et al,2025). Following construction and operation the Site will be returned to a semi natural landscape which can be traversed by Otter once more. As such, the impact of removal of drainage ditch habitat on-site during construction is deemed **negative, not significant, short-term** impact at a local scale.

Noise from the operation of machinery during the Construction phase of the Proposed Development has the potential to disturb Otters identified as using the Site surroundings for commuting and foraging. Whilst this noise will temporarily deter Otter from a radius of

approximately 150m around the Site boundary, the wide commuting and foraging range and ample alternative sites for such commuting and foraging activities within this range from the Site reduces the impact of noise from the proposed development to **negative, not significant, temporary** impact at a local scale.

Construction phase vehicle presence, soil preparation activities and drainage ditch infilling works within the Site boundary may introduce contaminated surface water discharges into the adjacent ditches which could still be in use by Otter. Vehicle presence above the infilled drainage ditches could also bring about loading on the installed infill materials within the drainage ditches on-site which could cause the compression of any air spaces in such filter installations and could later cause compaction and impediment of water flow into this habitat, or cause possible peat and soil movement into any unstable sections of the drainage ditch habitats adjacent to the Site, consequently disturbing the habitat. This contamination could lead to a reduction in water quality and a subsequent reduction in resource availability for otter using these adjacent ditches. As discussed above, the range and area of suitable alternative habitat accessible to otter will support otter in retreating from the site throughout construction and operation to avoid such impacts, however otter habitat within the adjacent drainage ditches to the Site should be protected throughout to reduce longer lasting impacts as far as possible. As such, in the absence of mitigation, the impact of contaminated surface and ground waters released from the proposed construction activities at the site is deemed **negative, moderate, temporary** on a local scale.

5.12.2.3.5 Irish Hare

Although no Hare forms or other signs of Irish Hare were observed during the visit, it is still possible that this species are using the Site for foraging and commuting; construction activities may place Irish hare at risk of injury or death, if they are not appropriately excluded from the works areas. Additionally, it is possible that Irish Hare could move in from the surrounding suitable habitats during the time which elapses before construction commencement and form new breeding depressions within the heather and tall grasses present within the habitats scheduled for removal. Inadvertent vegetation clearance of such sites for Irish Hare could cause disturbance and/ or direct injury or mortality to the species. As such, this represents a **negative, significant, short term** impact at a local scale.

The removal of vegetation at the Site during the construction phase of the proposed development will temporarily reduce the foraging and commuting habitat availability for Irish Hare. However, given that the Site is relatively small and is located within a large area of suitable foraging and commuting habitats, the loss of this habitat is not expected to significantly impact the species. In addition, the Site borders and surrounding suitable habitat are to be retained and the Site location does not fragment the suitable wider habitats, hence retaining habitat connectivity, and given the fact that following temporary loss, the land will be returned to a semi natural field of native grassland - an alternative, appropriate habitat for Irish Hare. Thus, the impact of habitat loss on Irish Hare is deemed as **negative, slight, short term** impact at a local scale.

During the construction phase, machinery and vehicles present on site for infilling and soil management will emit noise into adjacent habitat to the proposed development which could still be providing commuting and foraging habitat to Irish Hare. Irish Hare have the potential to be disturbed by noise. As such, the impact of noise from the Proposed Development presents a **negative, slight, temporary** impact to Irish Hare at a local scale.

5.12.2.3.6 Pine Marten

Suitable habitat was present for Pine Marten in the form of coniferous trees such as Scott's Pine which were scattered within and around the Site of varying maturity, however no signs or individuals of these species, or suitable nesting hollows for pine marten were observed. Despite this, it is still possible that this species are using the Site for foraging and commuting; construction activities may place Pine Marten at risk of injury or death, if they are not appropriately excluded from the works areas. Additionally, it is possible that trees within the Site could fall or become damaged during the time which elapses before construction commencement of any given vegetated area, which would present new suitable nesting habitat which Pine Marten individuals from the surrounding areas may then in-habit. Inadvertent vegetation clearance of such vegetation could cause disturbance and/ or direct injury or mortality to the Pine Marten. As such, this represents a **negative, significant, short term** impact at a local scale.

Given that vegetation at the Site is to be removed during the construction phase of the proposed development, and end habitat includes native grassland and a small tree/ scrub boarder only at this point, this will reduce the foraging and commuting habitat availability for Pine Marten. However, given that the Site is relatively small and is located within a large area of suitable foraging and commuting habitats, the loss of this habitat is not expected to significantly impact the species. In addition, the Site borders and surrounding suitable habitat are to be retained and the Site location does not fragment the suitable wider habitats, hence retaining habitat connectivity. Native planting will also be undertaken to bolster woodland habitat areas around the periphery of the Site. Thus, the impact of habitat loss on Pine Marten is deemed as **negative, slight, long-term** impact at a local scale.

During the construction phase, machinery and vehicles present on site for infilling and soil management will emit noise into adjacent habitat to the proposed development which could still be providing commuting and foraging habitat to Pine Marten. Pine Marten have the potential to be disturbed by noise. As such, the impact of noise and dust from the Proposed Development presents a **negative, slight, temporary** impact to Pine Marten at a local scale.

5.12.2.3.7 Red Squirrel

Suitable habitat was present for Red Squirrel in the form of coniferous trees such as Scott's Pine which were scattered within and around the Site. Whilst no on-site breeding signs were identified, it is still possible that this species are using the Site for foraging and commuting. Construction activities may place Red Squirrel at risk of injury or death, if they are not appropriately excluded from the works areas. Additionally, although no individuals of these species or breeding sites including dreys or suitable hollows for cavity nest building were observed, it should be noted that the walkover surveys were also not conducted within Red Squirrel nest building season, hence Red Squirrel may subsequently still move on-site into these suitable bog woodland habitat and build dreys within the branches during the time which elapses before construction commencement of any given vegetated area. It is also possible that trees within the Site could become damaged during this time, which could present new suitable hollows for cavity nest building. Inadvertent clearance of such vegetation could cause disturbance and/ or direct injury or mortality to the Red Squirrel. As such, this represents a **negative, significant, short-term** impact at a local scale.

The removal of vegetation at the Site during the construction phase of the proposed development will temporarily reduce the foraging and commuting habitat availability for Red

Squirrel. However, given that the Site is relatively small and is located within a large area of suitable foraging and commuting habitats, the loss of this habitat is not expected to significantly impact the species. In addition, the Site borders and surrounding suitable habitat are to be retained and the Site location does not fragment the suitable wider habitats, hence retaining habitat connectivity. Native planting will also be undertaken to bolster woodland habitat areas around the periphery of the Site. Thus, the impact of habitat loss on Red Squirrel is deemed as **negative, slight, long-term** impact at a local scale.

During the construction phase, machinery and vehicles present on site for infilling and soil management will emit noise into adjacent habitat to the proposed development which could still be providing commuting and foraging habitat to Red Squirrel. Red Squirrel have the potential to be disturbed by noise. As such, the impact of noise from the Proposed Development presents a **negative, slight, temporary** impact to Red Squirrel at a local scale.

5.12.2.3.8 Small Mammals

The loss of scrub areas within cutover bog and bog woodland habitats on-site could lead to a loss of suitable nesting, resting and foraging habitat for small mammals including European Hedgehog, Irish Stoat and European Pygmy Shrew. The central habitats will be permanently lost to facilitate the Proposed Development, leaving only a small boarder of habitat around the Site periphery as well as fringe habitats available for foraging. That said, not all habitat areas are optimal due to the wet nature of the habitats, and although some areas of drier, scrubber are present, the wider landscapes contain an abundance of agricultural lands (crop and pasture fields), hedges, woodland and scrub that is more suitable for nesting, resting and foraging. Therefore, the overall impact from habitat loss on any small mammals occurring at the Site is considered to be **imperceptible**.

However, construction activities such as vegetation removal and inappropriate storage of materials could place small mammals present at the Site at risk of injury or death. In the absence of precaution, this risk represents a potential **significant, negative, short-term** impact on locally occurring small mammals at the Site.

5.12.2.3.9 Amphibians

Given the historical presence of amphibians in the area and the suitable habitat observed within the drainage ditches on-site, it is presumed that amphibians could be present on-site. As discussed in Section 5.12.2.2.3, the construction phase will entail the clearance of vegetation from the majority of these on-site drainage ditches followed by infilling with clean washed Clause 6A material. Given the possible presence of amphibians within these habitats, this presents a risk of direct physical injury or death to amphibians. As such, this represents a **negative, significant, short-term** impact at a local scale.

In addition, the filling of the drainage ditches will lead to the loss of open air access to the linear, waterbody/ wet channel, removing its capacity to support wetland vegetation and amphibian communities. That said, the site is surrounded by an abundance of additional drainage ditch habitat, as well as wetter areas of bog habitat which could also support these species. Additionally, the reduced water filtration rate of the final infill site following operational completion is likely to be lower, and the slope created is likely to support runoff of water and possible pooling in new area, This could create new habitat for amphibians in addition to that which already surrounds the Site. As such, the overall impact from habitat loss on amphibians occurring at the site is considered to be **imperceptible**.

As discussed in Section 5.12.2.2.5, vegetation removal, vehicle presence and soil preparation activities, as well as the modifications to the drainage ditches within the Site boundary may introduce surface water discharges into the adjacent ditches containing construction phase pollutants (e.g., silt and sediments, hydrocarbons, soils from infilling deliveries, dust, etc.). Additionally, vehicles could bring about loading on the installed infill materials within the drainage ditches on-site which could cause compaction and impediment of water flow into this habitat, or cause possible peat and soil movement into any unstable sections of the drainage ditch habitats adjacent to the Site. This would cause water quality deterioration and reduction of water supply to these adjacent habitats, as such, this represents a potential **negative, moderate, temporary impact** on a local scale.

5.12.2.3.10 Fauna of the Barrow and Triogue Rivers

White-clawed Crayfish (*Austropotamobius pallipes*) have been recorded within 10km of the Proposed Infilling Site within the last 20 years. Additionally, although unlikely, the western most drainage ditch could also support this species. The River Triogue and Barrow are also known to support Fresh Water Pearl Mussel (FWPM) due to the area being an FWPM catchment. Although unlikely, there is a potential that these habitats will be subject to additional contaminant and sediment load as a result of dust and groundwater transfer of contaminants which could in turn result in water quality reduction. Both White clawed crayfish and Freshwater Pearl Mussel require clean aquatic habitat with low sediment load and pollution levels to survive hence impacts of such reduction in water quality could result in loss of habitat, disturbance and death of these species. Such is the case with most fish assemblages also. As such, this represents a potential **negative, significant, short-term impact** on fauna of the Triogue and Barrow Rivers at a local scale.

5.12.2.3.11 Marsh Fritillary

Vegetation clearance associated with the construction phase of the Proposed Development will involve the removal of cutover bog habitat. Given that this habitat has been found to support Devils Bit Scabious (DBS), the food and larval plant of Marsh Fritillary, in close proximity to the Site, removal of this habitat will result in loss of possible suitable breeding and foraging habitat for the species. It is not known at this time whether the infilling soil and newly created native grassland habitat will support Devils Bit Scabious to compensate for the possible lost habitat. Whilst it should be noted that only individual plants were identified, as opposed to clusters of DBS which better support Marsh Fritillary, no in-season botanical survey for Devils Bit Scabious or Marsh Fritillary identification and larval web surveys have been undertaken thus far. As such, the possibility that the habitats on-site which are scheduled for removal are utilised by this species for breeding and foraging cannot be ruled out, nor can impacts to the species resulting from the Proposed Development. As such, habitat removal during construction of the Proposed Development presents a **significant, negative, long term impact** on a county scale.

On-site mechanical removal of vegetation during construction could lead to injury or death of Marsh fritillary individuals or larvae if present. This presents a **significant, negative, long term impact** on a county scale.

Soil moved throughout the later stages of the construction phase once most vegetation has been cleared has the potential to become airborne in dust if not managed appropriately, this could damage adjacent habitat which remains around the border of the Site and beyond which could also support Marsh Fritillary. As such, in the absence of dust mitigation, the impact of

dust released from the proposed operational activities at the site is deemed **negative, moderate, temporary** on a county scale.

5.12.3 Operational Phase

5.12.3.1 Impacts on Designated Sites

5.12.3.1.1 Clonreher Bog NHA

An indirect air pathway to the Clonreher Bog NHA was identified, owing to the possibility that vehicles transporting the soil imports for infilling via the N80 could release dust when passing the Clonreher Bog. This remains a possibility, impacts which could occur as a result of this include covering of bog flora within the NHA with dust causing prevention of photosynthesis and damage. In the absence of mitigation, the potential impact on the Clonreher Bog NHA from the operational phase of the Proposed Development reflects a **negative, significant, short-term** impact on a National scale.

No operational phase impacts were identified for any other designated Sites within the relevant vicinity of the Proposed Development.

5.12.3.2 Impacts on Habitats and Flora

5.12.3.2.1 Cutover Bog (PB4)

Although the majority of cutover bog will have been lost during the construction phase of the Proposed Development, a small area will remain within the 10m buffer in the west of the Site and around the site periphery. Operational phase related traffic and activities in close proximity to the bog woodland flora that are directly adjacent to this 10m buffer may place them at risk of physical damage to their above ground growth through dust transfer, which may result in persisting effects on these floral species and in turn, the cutover bog habitat. This represents a potential **negative, significant, long-term** impact on a local scale.

The adjacent PB4 habitat also remains at risk of damage via the transfer of pollution which could leak from such machinery. These impacts would result in persisting effects on the flora and habitat. This represents a potential **negative, significant, long-term** impact on a local scale.

5.12.3.2.2 Bog Woodland (WN7)

Although the majority of bog woodland will have been lost during construction, a small area will remain within the 10m buffer in the west of the Site as well as around the periphery will remain throughout operation. Operation phase related traffic and infilling activities in close proximity to the trees within this habitat that are directly adjacent to this 10m buffer, or peripheral boarder may place them at risk of damage to their root protection zones, which could ultimately damage or destroy trees within this habitat. This is a particular concern within this habitat as the movement of soils may encroach easier and prevent floral species from photosynthesising, causing damage or death to the plants This represents a potential **negative, significant, long-term** impact on a local scale.

Infilling and recontouring activities ongoing adjacent to the remaining bog woodland on-site could also release dust onto these remaining bog woodland areas and cause physical damage to above ground growth of flora. This represents a potential **negative, significant, long-term** impact on a local scale.

Finally, remaining bog woodland habitat also remains at risk of damage via the transfer of pollution which could leak from such machinery, polluting the soils and causing damage and death to floral communities. These impacts would result in persisting effects on the flora and habitat. This represents a potential **negative, significant, long-term** impact on a local scale.

5.12.3.2.3 Drainage Ditches (FW4)

As for the western most drainage ditch, which, as described in Section 5.10.4.4 is wider than others and has permanent flow, the operational phase could bring about loading on the existing surface which will first cause the compression of any air spaces in the underlying peat, and later cause possible peat movement into any unstable sections of the ditch. There is also a risk that vegetation removal, vehicle presence and soil infill activities could introduce surface water discharges containing construction phase pollutants into the ditch (e.g., silt and sediments, cementitious materials used for fencing, hydrocarbons, soils from infilling deliveries, dust, etc.) via overland or groundwater flow. Given that the project design has embedded a vegetation 10m buffer of cutover bog flora and bog woodland to remain, which extends around this western most drainage ditch and stabilises the soil, impacts arising from soil compaction are not expected to occur. However, given that this buffer is only 10m, there still remains a possibility that construction phase pollutants could enter via groundwater or surface water flow. As such, pollution impacts to the western most drainage ditch are deemed to be **negative, significant, short-term** impact on a local scale.

It is also a possibility that infilling activities in close proximity to this habitat could result in the transfer of dust via the air into this habitat and contaminate the water. Although some protection will be provided by the 10m buffer, a precautionary approach will be taken owing to the varying height of the flora present. As such, this represents a potential **negative, significant, short-term** impact on a local scale.

5.12.3.2.4 Adjacent Bog Woodland & Cutover Bog Mosaic

Given that this habitat lies outside of the Site boundary, this will not be removed as part of this application. However, soil infilling and recontouring activities ongoing adjacent to the northern or southern border of the Site may place these areas of bog woodland and cutover bog at risk of damage via a number of mechanisms. For example, driving of vehicles and compacting of soils within close proximity to areas of bog woodland habitat presents a risk of damage to tree root protection zones and could cause physical damage to their above ground growth, which may result in persisting adverse effects on the trees. This represents a potential **negative, significant, long-term** impact on a local scale.

Additionally, soil infilling and recontouring activities may release dust on to these habitats. This could interfere with photosynthesis, causing damage or death to the plants. This represents a potential **negative, significant, long-term** impact on a local scale.

Vehicles on-site also present a risk of pollution; spills of fuel or lubricants could inadvertently leak from such vehicles and encroach into these adjacent habitats, polluting the soils and causing damage and death to floral communities. This represents a potential **negative, significant, long-term** impact on a local scale.

5.12.3.2.5 Adjacent Drainage Ditches

Given that this habitat lies outside of the Site boundary, this will not be removed as part of this application. However, the deposition of soil on-site and vehicle presence on-site may introduce surface water discharges into the adjacent ditches containing construction phase pollutants

(e.g., silt and sediments, hydrocarbons, soils from infilling deliveries, dust, etc.). These have the potential to enter the adjacent drainage ditches directly via air or surface water flow, and even travel downstream where drainage ditches present flow, thus have the potential to cause water quality deterioration within the drainage ditch habitats adjacent to the Site. The likelihood of this occurrence and subsequent negative impacts to flora and fauna within the adjacent habitat represents a potential **negative, significant, short-term impact** on the water quality of the adjacent drainage ditches on a local scale.

In addition to the above impact, the operational phase will see the movement of vehicles over the newly prepared soil during infilling. This could bring about loading on the installed infill materials within the drainage ditches on-site, which could in-turn cause the compression of any air spaces in such filter installations and could later cause compaction and impediment of water flow into this habitat, or cause possible peat and soil movement into any unstable sections of the drainage ditch habitats adjacent to the Site, consequently disturbing the habitat. This represents a potential **moderate, negative, short-term impact** on a local scale.

5.12.3.2.6 Triogue River

As discussed within Section 5.12.2.2.3, movement of soil and the presence of vehicles and machinery on the Site during the Proposed Development works presents a risk of the entry of contaminants (e.g., silt and sediments, hydrocarbons, soils from infilling deliveries) into the drainage ditch at the west of the Site via surface water or groundwater flow, or dust via air transport. Given that this drainage ditch connects with the Triogue River, such materials could also enter this habitat and reduce its water quality.

During the operational phase of the Proposed Development, vehicles will also be exiting and entering the Site more frequently which could lead to the buildup of such silt and soil materials on the adjacent roads in the southeast corner. Heavy rainfall in the could transport such buildup of soils via surface water runoff down the L2117 road directly into the Triogue River.

As such, the addition of such contaminants to the Triogue River represents a potential **significant, negative, short-term impact** to the habitat on a local scale.

5.12.3.2.7 River Barrow

A direct hydrological pathway to the River Barrow has been identified, as pollutants arising from Site infilling activities, sediment and contaminants have the potential to travel downstream via the western drainage ditch and subsequently the Triogue River where they could reduce water quality of this habitat resulting in negative health impacts on for a and fauna present. However, given the installation of the 10m buffer at the Site to reduce such impacts, as well as the significant distance between the Site and the Triogue which will sufficiently dilute any such release to in-significant levels, it is deemed that such impacts on the River Barrow from the Proposed Development will be **neutral, imperceptible, long term** at a local scale

5.12.3.2.8 Rare & Protected Flora

Although the majority of on-site habitats within which rare and protected flora could be present will have been cleared during the construction phase, small areas of vegetation set to be retained within the 10m buffer strip and vegetative boarder could still support such species. Operational activities such as the driving of vehicles across the Site as well as the tipping of infilling soils have the potential to introduce dust and pollutants via air or hydrological pathway into these remaining areas which could in-turn damage or destroy rare or protected floral

species. Such an instance represents a potential **negative, significant, long-term** impact on any rare and protected flora which may still be present on-site.

It is also possible that rare or protected plant species could recolonise the cleared land area depending on the time which elapses between vegetation clearance and infilling. As such it is a possibility that such species could physically damaged due to squashing or burial by vehicles on commencement of infilling of that section of the Site. As such, Such an instance represents a potential **negative, significant, long-term** impact.

5.12.3.2.9 Invasive Species – All Remaining Habitats

The operational phase will involve the importation of soils from external sites. This soil could contain plant material of invasive plant species. Given that this soil will be spread across the Site, this presents a risk of introduction of invasive species to both the Site and its surrounding habitats. However, given that all imported soils will have been dealt with in line with Article 27, and will contain only clean, inert, greenfield soil and stone absent of invasive plant material, this is not considered a risk. However, the entry of infilling vehicles on to Site does still present a risk of introduction of invasive species from further afield via material transfer on tyres for example. As such, this represents a potential **negative, significant, long-term** impact to all remaining habitats in absence of mitigation.

5.12.3.3 Impacts on Native Fauna

5.12.3.3.1 Bat Assemblage

Impacts resulting from the loss of commuting and foraging habitat for bats have been covered within Section 5.12.2.3.1.

Operational Phase lighting could potentially have a negative impact on local bat populations using the suitable habitats remaining in and around the Site, as most bat species avoid strongly lit areas when foraging and/or commuting. If operational phase lighting is directed to the high suitability treelines marking the edge of remaining bog woodland habitat parcels (Figure 5-1), it is possible for it to disrupt commuting routes of local bats. As such, in the absence of precaution and wildlife considerate lighting during operation, this risk represents a potential **negative, moderate, short-term** impact on the local bat assemblage.

5.12.3.3.2 Breeding Bird Assemblage

Given that the impact of the loss of suitable breeding bird habitat caused by the Proposed Development has been discussed for both construction and operation in Section 5.12.2.3.2 above, this will not be discussed in further detail here.

The increased human presence, noise and dust levels associated with the operational phase of the Proposed Development may have the potential to cause disturbance impacts to local breeding bird populations within the remaining vegetation around the Site or in the adjacent bog woodland and cutover peat habitat. There is also potential for disturbance from lighting associated with the operational phase of the Proposed Development, as lighting may need to be left on over-night to provide security. Night-time lighting has been shown to negatively affect birds (See Section 5.12.2.3.2 for more detail on this impact). Considering this, in the absence of appropriate Site management and mitigation, disturbance from Construction-related increases in noise, dust and lighting is considered to have the potential to cause **negative, significant, short-term** impacts on local breeding bird populations.

5.12.3.3.3 Wintering Bird Assemblage

Given that the impact of the loss of suitable wintering bird habitat caused by the Proposed Development has been discussed for both construction and operation in Section 5.12.2.3.3 above, this will not be discussed in further detail here.

The increased human presence, noise and dust levels associated with the operational phase of the Proposed Development may have the potential to cause disturbance impacts to local winter bird populations within the remaining vegetation around the Site or in the adjacent bog woodland and cutover peat habitat. There is also potential for disturbance from lighting associated with the operational phase of the Proposed Development, as lighting may need to be left on over-night to provide security. Night-time lighting has been shown to negatively affect birds (See Section 5.12.2.3.3 for more detail on this impact). Considering this, in the absence of appropriate Site management and mitigation, disturbance from Construction-related increases in noise, dust and lighting is considered to have the potential to cause **negative, significant, short-term** impacts on local wintering bird populations.

5.12.3.3.4 Otter

Given that the impact of the loss of commuting and foraging habitat caused by the Proposed Development has been discussed for both construction and operation in Section 5.12.2.3.4 above, this will not be discussed in further detail here.

Noise from the operation of vehicles and machinery during the operational phase of the Proposed Development has the potential to disturb Otters identified as using the Site and its surrounding drainage ditches and rivers for commuting and foraging. Whilst this noise will temporarily deter Otter from a radius of approximately 150m around the Site boundary, the wide commuting and foraging range and ample alternative sites for such commuting and foraging activities within this range will allow Otters to retreat naturally into these habitats in the short term. Given that the site will be returned to semi natural native grassland with an absence of such sources of noise following the main operations, the otters will be able to return to traverse the site without disturbance impact potential. Therefore, the impact of noise from the proposed development is deemed **not significant** throughout the operational phase.

Dust release from the movement of soil throughout the operational infilling phase of the proposed development has the potential to become airborne if not managed appropriately, this could cause the reduction in water quality within adjacent drainage ditches to the Site which could theoretically remain utilised by Otter, negatively impacting the species through resource reduction. As discussed above, the range and area of suitable alternative habitat accessible to Otter will support the species in retreating from the site throughout operation to avoid such impacts, however otter habitat within the adjacent drainage ditches to the Site should be protected throughout to reduce long term impacts as far as possible. As such, in the absence of dust mitigation, the impact of dust released from the proposed operational activities at the site is deemed **negative, significant, short term** on a local scale.

Operational phase vehicle presence, soil preparation activities and drainage ditch infilling works within the Site boundary may introduce contaminated surface water discharges into the adjacent ditches which could still be in use by Otter. Vehicle presence above the infilled drainage ditches could also bring about loading on the installed infill materials within the drainage ditches on-site which could cause the compression of any air spaces in such filter installations and could later cause compaction and impediment of water flow into this habitat, or cause possible peat and soil movement into any unstable sections of the drainage ditch

habitats adjacent to the Site, consequently disturbing the habitat. This contamination could lead to a reduction in water quality and a subsequent reduction in resource availability for Otter using these adjacent ditches. As discussed above, the range and area of suitable alternative habitat accessible to Otter will allow for the species natural retreat from the site throughout operation to avoid such impacts, however otter habitat within the adjacent drainage ditches to the Site should be protected throughout to reduce long term impacts as far as possible. As such, in the absence of mitigation, the impact of contaminated surface and ground waters released from the proposed construction activities at the site is deemed **negative, significant, short term** on a local scale.

5.12.3.3.5 Irish Hare

Given that the impact of the direct loss of potential Irish Hare breeding, commuting and foraging habitat caused by the Proposed Development has been discussed for both construction and operation in Section 5.12.2.3.5 above, this will not be discussed in further detail here.

Operational activities may place Irish Hare utilising adjacent habitat throughout the operational phase for foraging and commuting at risk of injury or death, if they are not appropriately excluded from the works areas. As such, this represents a **negative, significant, short-term** impact at a local scale.

During the operational phase, machinery and vehicles present on site for infilling and soil management will emit noise and dust into adjacent habitat to the proposed development which could still be providing commuting and foraging habitat to Irish Hare. Irish Hare have the potential to be disturbed by noise when within close proximity, and dust contamination could destroy suitable foraging or commuting habitat unnecessarily. As such, the impact of noise and dust from the Proposed Development presents a **negative, significant, short term** impact to Irish Hare at a local scale.

5.12.3.3.6 Pine Marten

Given that the impact of the direct loss of potential Pine Marten breeding, commuting and foraging habitat caused by the Proposed Development has been discussed for both construction and operation in Section 5.12.2.3.6 above, this will not be discussed in further detail here.

Operational activities may place Pine Marten utilising adjacent habitat throughout the operational phase for foraging and commuting at risk of injury or death, if they are not appropriately excluded from the works areas. As such, this represents a **negative, significant, short term** impact at a local scale.

During the operational phase, machinery and vehicles present on site for infilling and soil management will emit noise and dust into adjacent habitat to the proposed development which could still be providing commuting and foraging habitat to Pine Marten. Pine Marten have the potential to be disturbed by noise when within close proximity, and dust contamination could destroy suitable foraging or commuting habitat unnecessarily. As such, the impact of noise and dust from the Proposed Development presents a **negative, significant, short term** impact to Pine Marten at a local scale.

5.12.3.3.7 Red Squirrel

Given that the impact of the direct loss of potential Red Squirrel breeding, commuting and foraging habitat caused by the Proposed Development has been discussed for both construction and operation in Section 5.12.2.3.7 above, this will not be discussed in further detail here.

Operational activities may place Red Squirrel utilising adjacent habitat throughout the operational phase for foraging and commuting at risk of injury or death, if they are not appropriately excluded from the works areas. As such, this represents a **negative, significant, short term** impact at a local scale.

During the operational phase, machinery and vehicles present on site for infilling and soil management will emit noise and dust into adjacent habitat to the proposed development which could still be providing commuting and foraging habitat to Red Squirrel. Red Squirrel have the potential to be disturbed by noise when within close proximity, and dust contamination could destroy suitable foraging or commuting habitat unnecessarily. As such, the impact of noise and dust from the Proposed Development presents a **negative, significant, short term** impact to Red Squirrel at a local scale.

5.12.3.3.8 Small Mammals

Given that the impact of the direct loss of potential small mammal breeding, commuting and foraging habitat caused by the Proposed Development has been discussed for both construction and operation in Section 5.12.2.3.8 above, this will not be discussed in further detail here.

Operational activities may place small mammals utilising adjacent habitat throughout the operational phase at risk of injury or death, if they are not appropriately excluded from the works areas. As such, this represents a **negative, significant, short term** impact at a local scale.

The same reasoning presented within Section 5.12.2.3.8 when deeming on-site habitat loss to small mammal species as imperceptible can also be applied to adjacent habitat suitable for this species subject to possible impacts from noise and dust. Despite possible disturbance of small mammals from the periphery of the site, the required range of these species in comparison to the large abundance of alternative habitat accessible to the species within this group deems the impact of adjacent habitat disturbance via dust and air as **imperceptible**.

5.12.3.3.9 Amphibians

Given that the impact of the direct loss of suitable amphibian breeding and foraging habitat caused by the Proposed Development has been discussed for both construction and operation in Section 5.12.2.3.9 above, this will not be discussed in further detail here.

On-site drainage ditch habitat for amphibian will be removed before the operational phase, however, vehicle tracks and uneven infilling lands may give rise to new sections of pooling water. Vehicle use and infilling activities on or near any incidental occurrences of amphibians which have managed to use such temporary standing water features could cause injury or death to amphibians. As such, this represents a potential **negative, significant, short-term** impact at a local scale.

During the operational phase, machinery and vehicles present on site for infilling and soil management will emit noise and dust into adjacent habitat to the proposed development which

could still be providing habitat to amphibians. Dust contamination could destroy suitable foraging or commuting habitat unnecessarily. As such, the impact of noise and dust from the Proposed Development presents a **negative, significant, short term** impact to amphibians at a local scale.

5.12.3.3.10 Fauna of the Barrow and Triogue Rivers

White-clawed Crayfish (*Austropotamobius pallipes*) have been recorded within 10km of the Proposed Infilling Site within the last 20 years. Additionally, although unlikely, the western most drainage ditch could also support this species. The River Triogue and Barrow are also known to support Fresh Water Pearl Mussel (FWPM) due to the area being an FWPM catchment. Although unlikely, there is a potential that these habitats will be subject to additional contaminant and sediment load as a result of dust and groundwater transfer of contaminants which could in turn result in water quality reduction. Both White clawed crayfish and Freshwater Pearl Mussel require clean aquatic habitat with low sediment load and pollution levels to survive hence impacts of such reduction in water quality could result in loss of habitat, disturbance and death of these species. Such is the case with most fish assemblages also. As such, this represents a potential **negative, significant, short-term** impact on fauna of the Triogue and Barrow Rivers at a local scale.

5.12.3.3.11 Marsh Fritillary

Given that the impact of the possible loss of suitable Marsh Fritillary breeding, commuting and foraging habitat caused by the Proposed Development has been discussed for both construction and operation in Section 5.12.2.3.11 above, this will not be discussed in further detail here.

Although vegetation is to be cleared during the construction phase, infilling will occur over a 5 year period. Within this time, the area could be re-colonised by the food plant for this species, re-creating habitat on-site which would increase likelihood of presence at the time of infilling and subsequently result in injury or death of the species. As such, this presents a **negative, significant, short term** impact on a county scale.

Dust release from the movement of soil throughout the operational infilling phase of the proposed development has the potential to become airborne if not managed appropriately, this could damage or prevent the growth of flora making up adjacent bog woodland and cutover bog habitat which could be supporting newly grown Devils Bit Scabious, negatively impacting the species through loss of peripheral breeding and foraging habitats. As such, in the absence of dust mitigation, the impact of dust released from the proposed operational activities at the site is deemed **negative, significant, short term** on a county scale.

5.12.4 “Do Nothing” Impact

If the Proposed Development was not to go ahead the Site would continue to provide suitable habitats for an already relatively high biodiversity of local flora and fauna. The areas of cutover peat would likely continue to undergo succession and become populated by an increasing cover of colonising and young then mature Scot's Pine, Birch and Alder. The bog woodland would continue to mature and support an increasing proportion of shade tolerant plants. This overall increase in shade cover would eventually reduce the availability of optimal habitat for devils bit scabious, the Marsh fritillary food plant as this grows best in full or partial sunlight, however the extent of this effect cannot be known. This overall succession toward bog woodland would also reduce the area of open scrub habitat available to some ground nesting

birds and facilitate a switch to canopy covered scrub less suitable for some red listed species including meadow pipit. Increased bog woodland would also support greater numbers of small mammal individuals such as Pine Marten and Red Squirrel through the provision of additional nesting, resting and foraging habitat. The drainage ditches would continue to provide suitable wet habitat for amphibians, fish, otter and potential white clawed crayfish.

5.12.5 Potential Cumulative Impacts

5.12.5.1 Relevant Plans and Policies

The following plans and policies were reviewed and considered for possible in-combination effects with the Proposed Development.

- Laois County Development Plan 2021-2027
- Portlaoise Biodiversity Action Plan 2023-2028

5.12.5.1.1 Laois County Development Plan 2021-2027

Policies and objectives of the Laois County Development Plan 2021 – 2027 that are of relevance to this Screening Report are outlined below (LCC, 2022):

BNH1 Protect, conserve, and seek to enhance the county's biodiversity and ecological connectivity.

BNH 2 Conserve and protect habitats and species listed in the Annexes of the EU Habitats Directive (92/43/EEC) (as amended) and the Birds Directive (2009/147/EC), the Wildlife Acts 1976 and 2010 (as amended) and the Flora Protection Orders.

BNH 3 Support and co-operate with statutory authorities and others in support of measures taken to manage proposed or designated sites in order to achieve their conservation objectives and maintain the favourable conservation status and conservation value of Sites under National and European legislation and International Agreements and maintain and /develop linkages between them where feasible.

BNH 4 Protect and maintain the conservation value of all existing and future Natural Heritage Areas, Nature Reserves, Ramsar Sites, Wildfowl Sanctuaries and Biogenetic Reserves in the county.

BNH 5 Projects giving rise to significant cumulative, direct, indirect or secondary impacts on Natura 2000 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 not be permitted on the basis of this Plan (either individually or in combination with other plans or projects)[1]. Screening for AAs and AAs undertaken shall take into account invasive species as relevant.

BNH 6 Assess, in accordance with the relevant legislation, all proposed developments which are likely to have a significant effect (directly or through indirect or cumulative impact) on designated natural heritage sites, sites proposed for designation and protected species.

BNH 7 Protect Natural Heritage Areas (NHA) from developments that would adversely affect their special interests.

BNH 8 Recognise and protect the significant geological value of sites in County Laois and safeguard these sites, in consultation with the Geological Survey of Ireland and in accordance

with the National Heritage Plan and “Geological Heritage Guidelines for the Extractive Industry”.

BNH 9 Engage with the National Parks and Wildlife Service to ensure Integrated Management Plans are prepared for all Natura sites (or parts thereof) and ensure that plans are fully integrated with the County Development Plan and other plans and programmes, with the intention that such plans are practical, achievable and sustainable and have regard to all relevant ecological, cultural, social and economic considerations and with special regard to local communities.

BNH 10 Support the objectives of the All-Ireland Pollinator Plan 2015-2020 by encouraging the planting of pollinator friendly trees and plants within grass verges along public roads and existing and future greenways, new hedgerows, public parks and public open spaces in towns and villages, including part of mixed use and residential developments.

BNH 11 Support measures to protect Swift population such as the creation of Swift nest cavities in all new commercial and public buildings (schools/libraries, etc).

BNH 12 Supports the efforts of the Midland Transition team to: • Pursue funding opportunities and actions to mitigate the impact of the Bord na Móna job losses on the individuals concerned, and the impact on the local and regional economy; and • Position the region to develop alternative forms of employment, attract investment and maximise existing employment opportunities and resources.

BNH 13 It is a policy objective of the Council to require new developments to identify, protect and enhance ecological features by making provision for local biodiversity (for example, through provision of swift boxes or bricks, bat roost boxes, green roofs, etc.) and improve the ecological coherence of wider green infrastructure.

BNH 14 It is an objective of the Council to protect existing swift roosts as identified in the County Swift Survey and ensure existing nest sites are not lost through inappropriate renovation or destruction.

BNH 15 In dealing with applications for new developments, the Planning Authority will have regard to the following: • Inclusion of swift nesting opportunities in new buildings through use of swift brick or swift nest boxes where appropriate

BNH 16 Work with relevant stakeholders such as the Office of Public Works (OPW) and local stakeholders to develop a Landscape Conservation Assessment in relation to the Heath and its attributes during the plan period.

BNH17 The Great Heath of Portlaoise The Great Heath or The Heath is a rare example of unenclosed natural grassland in Ireland interspaced with small lakes and turloughs. It has one of the most sensitive and valuable landscapes in Laois. It is unique as a natural area (one of the last heathlands to develop in Europe , grazed but unfertilized for hundreds of years , a geological area (a rare example of karst and wetland ecosystem), an archaeological area, an ecological area , a historic area and a widely used amenity area. The area has many interested stakeholders, and it requires a study to develop a Landscape Conservation Assessment which would provide a framework for its protection and development into the future.

BNH18 Preserve, protect and, where necessary, enhance mass rocks and holy wells

BNH 19 Ensure that areas and networks of Green Infrastructure are identified, protected, enhanced, managed and created to provide a wide range of environmental, social and economic benefits to communities.

BNH 20 Develop and implement a Green Infrastructure Strategy for Laois in partnership with key stakeholders and the public which reflects a long-term perspective, including the need to adapt to climate change. Ensure the Green Infrastructure Strategy for Laois protects existing Green Infrastructure resources and plans for future Green Infrastructure provision.

BNH 21 Require all Local Area Plans and Master Plans to protect, enhance, provide and manage Green Infrastructure in an integrated and coherent manner. Set targets for the provision of Green Infrastructure elements such as trees and green roofs as part of the preparation of Local Area Plans.

BNH 22 Promote a network of paths and cycle tracks to enhance accessibility to the Green Infrastructure network, while ensuring that the design and operation of the routes respect and where possible enhances the ecological potential of each site.

BNH 23 Encourage, pursuant to Article 10 of the Habitats Directive, the management of features of the landscape, such as traditional field boundaries and laneways, important for the ecological coherence of the Natura 2000 network and essential for the migration, dispersal and genetic exchange of wild species.

BNH 24 To identify and map Green Infrastructure assets and sites of local biodiversity value over the lifetime of the Plan

BNH 25 Undertake a study within the lifetime of the Plan and for all Local Area Plans to document and map significant trees and groups of trees that require preservation and prepare Tree Preservation Orders for individual trees, groups of trees or woodland areas where expedient and in the interests of visual amenity, biodiversity and the environment.

BNH 26 Protect individual trees, groups of trees and woodland in the interests of landscape conservation (including townscapes) and nature conservation as part of the development management process.

BNH 27 Protect existing hedgerows, particularly of historical and archaeological importance of townland boundaries, from unnecessary removal in order to preserve the rural character of the countryside and promote biodiversity.

BNH 28 Ensure that hedgerow removal to facilitate development is kept to an absolute minimum and, where unavoidable, a requirement for mitigation planting will be required comprising a hedge of similar length and species composition to the original, established as close as is practicable to the original and where possible linking in to existing adjacent hedges. Native plants of a local provenance should be used for any such planting.

BNH 29 Promote and develop urban forests in parkland and street trees in urban settlements to enhance public realm and increase tree canopy coverage and diversity.

BNH 30 Ensure that hedgerow and mature tree removal to facilitate development is kept to an absolute minimum and, where unavoidable, a requirement for mitigation planting will be required comprising a hedge of similar length and species composition to the original, established as close as is practicable to the original and where possible linking in to existing adjacent hedges. Native plants of a local provenance should be used for any such planting.

BNH 31 Protect waterbodies and watercourses from inappropriate development, to ensure they are retained for their biodiversity and flood protection values and to conserve and enhance where possible, the wildlife habitats of the County's rivers and riparian zones, lakes, canals and streams which occur outside of designated areas to provide a network of habitats and biodiversity corridors throughout the county.

BNH 32 Promote and develop the Barrow Blueway initiative and work with State Agencies, landowners, local communities and other relevant groups to protect and manage inland waters, river corridors and their floodplains from degradation and damage, and to recognise and promote them as natural assets of the urban and rural environment.

BNH 33 Promote and facilitate the development of the Grand Canal for cycling, walking and nature study in conjunction with the relevant bodies including Waterways Ireland to enhance its amenity. Investigate the possibility of developing long distance walking routes/Greenway, within the lifetime of the Plan, along the disused Mountmellick Grand Canal Line.

BNH 34 Protect riparian corridors by reserving land along their banks for ecological corridors and maintain them free from inappropriate development. Where developments are proposed adjacent to waterways in previously undeveloped areas, the Planning Authority will require a general setback distance of a minimum of 10 metres from the waterways edge, subject to site-specific characteristics and the nature and design of the development. In previously developed areas, for example, within town centres, this general setback distance is likely to be reduced and should be part of any pre-planning consultations with the Council.

BNH 35 Require that development along rivers set aside lands for pedestrian routes and cycleways that could link to the broader area and established settlements in the area.

BNH 36 Provide for public access to waterways where feasible and appropriate, in partnership with the National Parks and Wildlife Service (NPWS), Waterways Ireland and other relevant stakeholders, whilst maintaining them free from inappropriate development, subject to Ecological Impact Assessment and Appropriate Assessment, as appropriate.

BNH 37 Protect the Nore Pearl Mussel through the measures set out in the Freshwater Pearl Mussel Nore Sub-Basin Management Plan (2009).

BNH 38 Protect the migration of fish in the River Barrow Nore SAC from high risk barrier such weirs and bridge sills.

BNH 39 Protect, conserve, preserve, manage and enhance wetlands (including fens and turloughs) from infilling, fragmentation, degradation and protect and conserve their quality, character and features. Resist development (including land reclamation) which would destroy, fragment and degrade wetlands, coastal wetlands, estuarine marshland and control adjacent development by the use of buffer zones.

BNH 40 The County Development will continue to support the objectives of the Strategic Framework for the Future use of Peatlands which identifies new potential future land uses and also seek to progress opportunities under Just Transition Fund.

BNH 41 Protect the county's designated peatland areas and landscapes and to conserve and manage their ecological, archaeological, cultural, and educational heritage by promoting high environmental standards in conjunction with Bord na Mona, NPWS, IPPC, NGO's and local communities.

BNH 42 Work with relevant agencies such as Eastern and Midland Regional Assembly, Bord na Mona, NPWS, Coillte and adjacent Local Authorities to prepare an integrated afteruse framework and management plans for the peatlands and related infrastructure,

BNH 43 Support the preparation of a Sustainable Holistic Management Plan for the future use of the Industrial Peatlands in the County, which recognises the role of peatlands in carbon sequestration.

BNH 44 Support the designation of a National Park for the peatlands area in the Midlands in conjunction with adjoining Local Authorities.

BNH 45 Undertake a feasibility study to identify peatways, where appropriate and examine the tourist potential of same such as a peatway link from Portarlinton to the Grand Canal and River Barrow Greenway.

BNH 46 Support relevant agencies to provide for the future sustainable and environmentally sensitive use of large industrial peatlands at Cuil Na Mona.

5.12.5.1.2 Portlaoise Biodiversity Action Plan 2023-2028

The Portlaoise Biodiversity Action Plan (2023-2028) is set out to protect and improve biodiversity through specific objectives and targets, those most relevant to this development are outlined below (GPC & MEBES, 2022):

- **Objective 3** Working with landowners to highlight the biodiversity value of Portlaoise's surrounding lands
 - **Target 3.1** Strengthen local farm green infrastructure
 - **Target 3.2** Create and further awareness of the biodiversity value of the extensive peatlands in Portlaoise's hinterlands
 - **Target 3.3** Create and further awareness of the biodiversity value of the forests and woodlands in Portlaoise's hinterlands
 - **Target 3.4** Ensure the future development of Kyletalesha Landfill has high biodiversity quality
- **Objective 4** Delivering species and habitat specific actions
 - **Target 4.1** Increase native tree cover in the town
 - **Target 4.2** Conserve local wildflowers and species rich grasslands
 - **Target 4.3** Install bird nest boxes in the town
 - **Target 4.4** Create solitary bee nesting sites in the town
 - **Target 4.5** Create habitat sites for mammals
 - **Target 4.6** Improve the biodiversity quality of the Triogue River
 - **Target 4.7** Increase the number of wildlife ponds managed with biodiversity in mind
- **Objective 5** Controlling Invasive Alien Species
 - **Target 5.1** Increase our knowledge and understanding of Invasive Alien Species in the town
 - **Target 5.2** Take practical control measures for Invasive Alien Species in the town
- **Objective 6** Move towards the elimination of herbicide use

- **Target 6.1** Move towards the elimination of herbicide use in the community
- **Target 6.2** Raise awareness of the negative impacts of herbicide use for biodiversity and our health

5.12.6 Existing Planning Permissions

There are several existing planning permissions on record in the area ranging from small-scale extensions and alterations to existing residential properties to some larger-scale developments. The larger existing developments identified within 2km of the Site and along the same impact pathways (e.g., the Liffey) as the Proposed Development are identified below in *Table 5-12* and the potential for possible in-combination effects with the Proposed Development are assessed.

Table 5-12: Assessment of potential in-combination effects of the Proposed Development and other developments pending or granted permission in the last 5 years

Planning Reference	Planning Authority	Status	Location
2560308	Laois County Council	Conditional permission granted	Kyletalesha & Kyleclonhobert, Portlaoise, County Laois, R32W978
Development Description The continued use of the site and premises from the 1st January 2026 as a waste transfer and processing facility, consistent with the extant permission Reg. Ref. 15/403.			
Potential for in Combination effects The biodiversity chapter within the EIAR for this proposal describes the biodiversity of the site and the impacts the proposed changes will have on the receiving environment within and outside the site boundary, including a 'baseline' scenario. It identifies the prevention and mitigation measures that are and will be implemented to reduce the significance of the impacts and assesses the residual impacts. The assessment took into consideration ecosystems (habitats and organisms) inside and outside the facility boundary. The operational area is almost entirely covered with building and paved areas and, as the development does not involve any construction works or disturbance of habitats inside and outside the site boundary an ecological survey was not required. A screening of the significance of the effects, if any, of the development on Natura 2000 sites within 10 km of the site to inform a decision on the need for an Appropriate Assessment was carried out. The screening concluded that the development would not have any likely significant effects on any Natura 2000 Site and therefore a Natura Impact Statement (NIS) was not required.			
21745	Laois County Council	Permission granted	Cappagh North, Portlaoise, Co. Laois
Development Description Construct a two storey dwelling, domestic garage, wastewater treatment system, new recessed entrance and all associated site works.			
Potential for in Combination effects			

Given the scale of the proposed development, it was not deemed that an ecological impact assessment was required, as such there are no ecological reports. It was also deemed that the application does not work within or close to any European Site or Natural Heritage Area. As such, no in-combination effects are expected from this development.			
21554	Laois County Council	Permission granted	Kyleclonhobert,, Portlaoise, Co. Laois
Development Description Construct a dwelling house, domestic garage, waste water treatment system, percolation area, new bored well, new splayed entrance and associated site works Potential for in Combination effects Given the scale of the proposed development, it was not deemed that an ecological impact assessment was required, as such there are no ecological reports. It was also deemed that the application does not work within or close to any European Site or Natural Heritage Area. As such, no in-combination effects are expected from this development.			
2360519	Laois County Council	Permission granted	Ballytegan, Portlaoise, Co. Laois
Development Description Erect a new dwelling house, new site entrance and all associated site works Potential for in Combination effects Given the scale of the proposed development, it was not deemed that an ecological impact assessment was required, as such there are no ecological reports. It was also deemed that the application does not work within or close to any European Site or Natural Heritage Area. As such, no in-combination effects are expected from this development.			
2460197	Laois County Council	Permission granted	Greenwood, Clonreher, Portlaoise, Co. Laois., R32 AY9A
Development Description Construct proposed granny flat extension to existing dwelling house, decommission existing septic tank, install new septic tank treatment system , percolation area and all associated site works. Potential for in Combination effects Given the scale of the proposed development, it was not deemed that an ecological impact assessment was required, as such there are no ecological reports. It was also deemed that the application does not work within or close to any European Site or Natural Heritage Area. As such, no in-combination effects are expected from this development.			
2360237	Laois County Council	Permission granted	Kyletalesha, Portlaoise, Co. Laois
Development Description			

Construct Two Storey Type Dwelling & Domestic Garage with Effluent Treatment System & Percolation Area With New Vehicular Entrance and all associated site works.

Potential for in Combination effects

Given the scale of the proposed development, it was not deemed that an ecological impact assessment was required, as such there are no ecological reports. It was also deemed that the application does not work within or close to any European Site or Natural Heritage Area. As such, no in-combination effects are expected from this development.

25111

Laois
County
Council

Permission
granted

O'Moores Forest ,
Mountmellick

Development Description

Construct a two storey dwelling house, domestic garage, effluent treatment system, percolation area and all associated site works at O'Moores Forest, Mountmellick, Co. Laois

Potential for In Combination effects

Given the scale of the proposed development, it was not deemed that an ecological impact assessment was required, as such there are no ecological reports. It was also deemed that the application does not work within or close to any European Site or Natural Heritage Area. As such, no in-combination effects are expected from this development.

2313

Laois
County
Council

Permission
granted

Kyleclonhobert,
Portlaoise, Co.
Laois

Development Description

Retain milking parlor, slatted concrete tank, concrete yard and associated site works. Permission to build a cubicle shed, new silage pit, new agricultural entrance and associated site works

Potential for In Combination effects

The development is not specified in Part 2 of Schedule 5 of the Planning and Development regulations 2001. In any event, having regard to the nature, size and location, the proposed development would not be likely to have significant effects on the environment therefore an EIA is not required. In addition, the AA prepared for this development concluded that no likely significant impacts are predicted due to the nature of the Proposed Development. As such, no in-combination effects from this development are expected.

2560035

Laois
County
Council

Permission
granted

Kyleclonhobert,
Portlaoise, Co.
Laois

Development Description

Extend the existing agricultural cubicle shed, reroute the farm lane, and all associated site works.

Potential for In Combination effects

Given the scale of the proposed development, it was not deemed that an ecological impact assessment was required, as such there are no ecological reports. It was also deemed that the application does not work within or close to any European Site or Natural Heritage Area. As such, no in-combination effects are expected from this development.

2560036	Laois County Council	Permission granted	Derryguile, Mountmellick, Co Laois
Development Description Construct Slatted shed with crush yard and all associated site works. Potential for In Combination effects Given the scale of the proposed development, it was not deemed that an ecological impact assessment was required, as such there are no ecological reports. It was also deemed that the application does not work within or close to any European Site or Natural Heritage Area. As such, no in-combination effects are expected from this development.			
20409	Laois County Council	Permission granted	Kyletalesha & Kylecloncolbert, Portlaoise, Co. Laois
Development Description Delete condition 3 of permission 15/403 to allow the continuance of use of the site and premises after the 31st December 2020. The facility operates under an Industrial Emissions Licence granted by the Environmental Protection Agency. An Environmental Impact Assessment Report (EIAR) will be submitted to the planning authority with the application. The planning application and EIAR may be inspected, or purchased at a fee not exceeding the reasonable cost of making a copy, at the offices of the planning authority during its public opening hours Potential for In Combination effects The EIAR noted that there are no habitats of ecological importance within the site boundary and the site is not in or close to a Special Area of Conservation (SAC) or Special Protected Areas (SPA) and that the development will have no residual impact on the ecosystems inside and outside the site boundary. In addition, the AA prepared for this development concluded that no likely significant impacts are predicted due to the nature of the Proposed Development. As such, no in-combination effects from this development are expected.			

5.13 Avoidance, Remedial & Mitigation Measures

5.13.1 Avoidance by Design

A 10m buffer zone is to be implemented along the western boundary of the Site which will act to avoid impacts to the western most drainage ditch. This will prevent the accidental destruction of this habitat by helping mitigate impacts of the proposed development on the drainage ditch water quality.

A 1m border of retained vegetation will also be kept around the perimeter of the Site boundary to help avoid impacts to the adjacent habitats and help prevent negative impacts from occurring on potential faunal species which the habitat may support.

5.13.2 Construction Phase

Table 5-13 gives a summary of the best practice development standards and mitigation measures to be implemented during the Construction Phase of the Proposed Development. The measures listed are outlined in more detail in the Construction and Environmental

Management Plan (OCEMP) (Lenztech, 2023) accompanying this application under separate cover.

Table 5-13: Summary of best practice standards and mitigation outlined in the OCEMP (Lenztech, 2023). Where specific details relating to protection of Key Ecological Receptors is required under these measures, reference is made to the appropriate section in the report.

Theme	Best Practice Standards and Mitigation	Ecology Specific Mitigation Required
Soils and Geology	Appropriate measures to store and handle stripped topsoil and subsoil; consideration of weather conditions to minimise silt/sediment entering surface water network and dust control; and appropriate fill material import, storage and handling away from surface water features. Appropriate measures to prevent the discharge of contaminated water via surface water or ground water runoff from Site. Appropriate storage of fuels, oils and other chemicals, designated refuelling and maintenance area, and preparation of emergency response procedure.	Yes – see sections 5.13.2.1.1 to 5.13.2.1.5
Water Hydrogeology	- Measures for surface water discharge and sediment/contaminant control through use of silt barriers and filter systems, wheel washing measures, prevention and control of accidental spills and leaks, concrete handling.	Yes – See sections 5.13.2.1.3 to 5.13.2.1.5
Water Supply, Drainage & Utilities	Appropriate use of suds, foul water to be tankered off site for treatment and no connections (waste water, water supply, electrical, gas and telecommunications) to be made.	No.
Site Compound Facilities and Parking	Appropriate measures to handle foul water generated, protect potable water supply, health and safety, separate areas for (i) machinery and plant; (ii) concrete batching; and (iii) staff parking.	No.

Landscape and Visual Impact	Establishment of Tree Protection Zones in accordance with BS 5837:2012 ' <i>Trees in Relation to Design, Demolition and Construction – Recommendations</i> ';	Yes – see section 5.13.2.1.6
Noise and Vibration	To comply with the requirements of BS 5228-1:2009+A1:2014 and BS 5228-2:2009+A1:2014 (Code of Practice for Noise and Vibration Control on Construction and Open Sites) as well as Safety, Health and Welfare at Work (General Application) Regulations 2007, Part 5 Noise and Vibration.	No. However, potential for more detailed measures; see section 5.13.2.2.4
Air Quality	Dust Mitigation measures to include suppression via watering of areas identified as potential dust source; road sweeping to remove aggregate materials; appropriate cover of transported materials; wheel washing; maintenance of public roads in relation to dust; and appropriate monitoring.	Yes – See sections 5.13.2.1.1 and 5.13.2.1.2

In addition, to ensure the OCEMP remains 'fit for purpose' for the duration of the project it should be reviewed and updated by the Project Manager in consultation with the Contractor's Ecologist during the life of the project to ensure that it remains suitable to facilitate efficient and effective delivery of the project's environmental commitments. The Contractor shall also designate a Site Engineer/Manager/Assistant Manager as the Construction Waste Manager and who will have overall responsibility for the implementation of the Project Waste Management Plan (WMP). This Plan will be prepared upon appointment of the Main Contractor.

Additional mitigation measures required for sufficient protection of the KERs identified in this report, and/or details for the specific implementation of the mitigation measures as per the above table are given in the below sections.

5.13.2.1 Protection of Habitats

While best practice development standards have been included in the OCEMP for implementation, specific details are outlined within this section to ensure the sensitive ecological receptors including the western drainage ditch and adjoining Triogue River, as well as the remaining cutover bog habitat and bog woodland habitat are not adversely impacted as a result. This will also protect fauna which could be impacted by deterioration of these habitats

5.13.2.1.1 Mitigation 1: General Dust Control Measures

Dust and fine particle generation during the site clearance, construction of the TCC, widening of the road and associated works can be substantially reduced through the selection of adequate mitigation techniques and effective management. The most effective technique is to control dust at source and prevent it from becoming airborne by implementing the following mitigation measures:

- Excavated soils and vegetation during the site clearance works will be carefully managed and maintained in order to minimise potential effect on soil quality and soil structure.
- Handling of soils and materials will be undertaken in accordance with documented procedures outlined in the OCEMP that will be set out in order to protect ground and minimise airborne dust.
- The normal measures required to prevent airborne dust emissions and associated nuisance arising from site work will be in place, including measures to prevent uncovered soil drying out, leading to wind pick up of dust and mud being spread onto the local road network and adjoining properties.
- Vehicles travelling on any unsurfaced site roads shall have their speed restricted to 20 kph.
- Dust dispersal over the site boundary shall be minimised using methods as necessary.
- The main contractor shall allocate suitably qualified personnel to be responsible for ensuring the generation of dust is minimised and effectively controlled.

Potential effects and avoidance and mitigation measures associated with generation of dust are addressed in Chapter 8 of this EIAR in detail.

5.13.2.1.2 Mitigation 2: Dust Control – Site Roads and Track Out

While best practice development standards have been included in the OCEMP for implementation, specific details are outlined in this section to ensure the Triogue River and associated flora and fauna remain protected from inadvertent dust and silt deposition on the L217.

Site roads (particularly unpaved) can be a significant source of fugitive dust from construction sites if control measures are not in place. The most effective means of suppressing dust emissions from unpaved roads is to apply speed restrictions. Studies show that these measures can have a control efficiency ranging from 25-80%.

- A speed restriction of 20km/hr will be applied as an effective control measure for dust for on-site vehicles, in particular at site access/egress locations.
- Avoid dry sweeping of large areas.
- Vehicles entering and leaving the site will be covered to prevent escape of materials during transport.
- On-site haul routes will be regularly inspected by the Environmental Manager or appointed delegate for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.

- Dust suppression equipment must be used when point source emissions are likely.

5.13.2.1.3 Mitigation 3: Control and Management of Surface Water Runoff

While best practice development standards have been included in the OCEMP, further details are outlined in this section to ensure the ecology of the western drainage ditch and adjoining Triogue River, as well as the remaining cutover bog habitat and bog woodland habitat are not adversely impacted as a result. This will also protect fauna which could be impacted by deterioration of these habitats. With regards to protecting the retained drainage ditch and habitats, the following will be taken into consideration:

There will be no direct discharge to groundwater or surface water during the construction phase of the Proposed Development. The following mitigation measures will be adhered to during the construction phase of the Proposed Development:

- Silt fencing will be installed prior to the commencement of construction to ensure the protection of the onsite drainage ditches. Silt fencing will also be installed around the perimeter of the Site and silt traps placed in the drainage ditches to avoid sediment laden to migrate offsite to downgradient waterbodies.
- During the construction phase of the Proposed Development, measures would be adopted in order to prevent silt, chemicals and/or other contaminants from being washed into existing waterbodies (i.e., drainage ditches). Areas exposed due to the removal of vegetation are more susceptible to erosion during heavy rainfall, therefore, the areas would be reinstated as soon as possible to minimise this effect.
- Regular monitoring and prompt maintenance of the SuDS measures will ensure that the drainage system continues to function as designed:
 - Use of silt traps, silt fences and SuDS measures.
 - Exclusion zones between earthworks, stockpiles and temporary surfaces.
 - Temporary construction surface water drainage and sediment control measures installed prior to earthworks commencing.
 - Scheduling construction activities taking forecast weather conditions into consideration.
 - Silt ponds will be constructed on site as necessary to contain silt runoff.
 - An earth bund and silt fence will be constructed around the perimeter of the infill area. The earth bund and silt fencing will act as temporary sediment control devices to protect receiving watercourses from sediment and potential surface water runoff from the site. The fencing will be inspected twice daily based onsite and weather conditions for any signs of contamination or excessive silt deposits and records of these checks will be maintained.
 - A 10m buffer and silt fence will be maintained along the western drainage ditch where no soil importation shall take place to protect surface waters and to ensure that there are no offsite nuisances created by the site

- Stockpiles of loose materials pending reuse onsite will be protected for the duration of the works and not located in areas where sediment laden runoff may enter existing surface water drains.
 - To help shed rainwater and prevent ponding and infiltration, the sides and top of the stockpiles will be regraded to form a smooth gradient with compacted sides reducing infiltration and silt runoff.
 - Where required, silt fences will be erected at the toe of stockpiles to prevent runoff.
 - The silt fences will be monitored daily by the appointed contractor and silt will be removed as required.
 - Any materials excavated onsite during the construction works (i.e., construction phase) will be stored onsite close to the excavation location and reused where it is appropriate to do so during the operations phase. As such, offsite disposal of this material is not anticipated.
 - Low mound stockpiles will be formed from excavated material away from open drains.
- A regular review of weather forecasts of heavy rainfall will be conducted, and a contingency plan will be prepared before and after such events to minimise any potential nuisances. As the risk of the break-out of silt-laden runoff is higher during these weather conditions, no work will be carried out during such periods where possible.

5.13.2.1.4 Mitigation 4: Management of Infilling of Drainage Ditches

The infilling of the existing drainage ditches onsite will be undertaken with cognisance to Construction Industry Research and Information Association (CIRIA), 2006. 'Control of Water Pollution from Linear Construction Projects: Technical guidance' (CIRIA C649) and 'Control of water pollution from construction sites. Guidance for consultants and contractors (C532)' and the following mitigation measures will be strictly adhered to:

- The infilling of existing drainage features including drainage ditches and bog drains will be completed in accordance with Series 600 of the TII Specification for Road Works and the recommendations contained within the "NRA Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes".
- A 10-meter buffer and silt fence will be maintained along the western drainage ditch, where no vegetation clearance shall take place to protect surface waters and to ensure that there are no offsite nuisances created by the site.
- The existing drainage features (i.e., charted bog/field drains) will be cleared of vegetation and filled with clean washed CL6A material to TII specification. They will be maintained and upgraded to filter drains to maintain existing drainage flows.
- Before vegetation clearance commences, drainage runoff controls such as silt traps should be installed at the point where the site boundary intercepts any

on-site drainage ditch along the northern or southern boundary. This should remain in-place for the duration of the construction phase.

- The installation of a 450mm diameter perforated pipe and permeable surround within the infill area will be applicable to all surface water drains onsite.
- All material placed into drainage features will be deposited by end tipping without compaction.
- The water will be allowed to flow through the existing drainage features at right angles in either direction.
- Runoff from the areas of exposed soil will be intercepted by a silt fence installed in advance of the drainage ditch.
- Any machines working in the vicinity of the drainage ditches will be protected against leakage or spillage of fuels, oils, greases and hydraulic fluids.
- Any displaced water during the infilling of the drainage ditches will be allowed to infiltrate to ground in the immediate surrounding area. Where required, drainage runoff controls such as silt fences and silt traps will be provided.
- All trucks leaving the site will pass through a dry wheel wash, thereby removing the potential for transport of sediment offsite. The wheel wash will be periodically cleaned out and its contents will be disposed of in the appropriate manner by a suitably licensed waste contractor and never discharged onsite.

5.13.2.1.5 Mitigation 5: Construction phase Surface Water Control for Aquatic Habitat.

Silt fencing or bunding along the adjacent drainage ditches will be erected following the clearance of the Site (i.e. vegetation clearance) with cognisance of Inland Fisheries Ireland (IFI) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters (IFI, 2016). The silt fencing will act in filtering any potential surface water runoff from the site generated during the proposed works and will be retained in place for the duration of the construction phase until the development is complete. The project specific OCEMP (which will be finalised by the main contractor in advance of construction works commencing) will identify how this silt curtain is to be installed and maintained throughout the construction phase.

The silt fences will be monitored to ensure that they remain functional throughout the construction of the Proposed Development. Where necessary, maintenance will be carried out on the fences to ensure that they continue to be effective. This will be particularly important after heavy rainfall events. The checks will be undertaken by the Environmental Manager. The frequency of monitoring will depend on the stage of works, and local environmental conditions. Daily checks may be appropriate during the initial site clearance, during works in the vicinity of the drainage ditches and during and after storm events. Weekly or bi-weekly checks may be appropriate at other times (i.e. during the operational phase).

All works carried out in or adjacent to the drainage ditches will adhere to the Inland Fisheries Ireland (IFI) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters (IFI, 2016), the Transport Infrastructure Ireland (TII) Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (TII, 2008) and CIRIA C648 Control of Water Pollution from Linear Construction Projects (CIRIA, 2006).

All near stream works will include the following measures:

- Silt fences and other sediment control measures will be utilised as required to prevent sedimentation in the drainage ditches.
- Entry to the drainage ditches by vehicles beyond the silt fences will not be permitted, while vehicle usage along the banks will be restricted as much as practicable. Any machines working in close proximity of the watercourse must be protected against leakage or spillage of fuels, oils, greases and hydraulic fluids.

Additional measures to prevent impacts to watercourses can be found in Chapter 7 of this EIAR.

5.13.2.1.6 Mitigation 6: Tree retention and Protection

The Site plan provides for the retention of any trees present within a 1m boundary within perimeter of the Site, as well as within the 10m buffer strip along the west of the Site. Prior to commencement of construction at the Site, all trees within these areas desired for retention will be protected by the use of protective barriers and/or ground protection, fit for the purpose of ensuring the successful long-term preservation of the trees.

Trees that are destined to be retained must be protected by protective fencing, signage and/or ground protection prior to any materials or machinery being brought on site and prior to any development, demolition or soil stripping takes place. Areas that are designated for new plantings should be similarly protected. Barriers should be fit for the purpose of excluding construction activity. In most cases barriers should consist of a scaffold framework comprising a vertical and horizontal framework, well braced to resist impacts. To ensure the protective barriers are respected, clear concise signage must be affixed to the barrier in an unrestricted easily viewed location. The protective barriers shall remain in an undisturbed condition and only removed on completion of all construction activity finished grading and sodding. Any breach of the protective fence shall be reported to the consulting arborist or ecologist (NRA, 2006).

During the course of the construction works the integrity of the fencing must be respected and remain in place at all times. No building materials or soil heaps are to be stored within this area. Should essential works need to take place within the root protection area, the project arborist must be informed in advance and any necessary mitigation measures are to be put in place. The protective fencing must remain in situ for the duration of the project and must only be removed upon completion of all works. Construction is only to commence once the protective barriers and/or ground protection have been erected (NRA, 2006).

5.13.2.1.7 Mitigation 7: Pre-commencement Botanical Survey

Before construction works at the Site commence, a botanical survey will be undertaken within the main botanical growing season between March and October (NRA 2009). This survey should consist of a systematic search and recording of any flora classified as invasive, rare or protected (e.g. under Annex V of the EU habitats directive). Depending on the findings of this survey, further mitigation as outlined within Section 5.13.2.1.8, 5.13.2.1.9 or Section 5.13.3.2.35.13.2.2.7 may be required.

5.13.2.1.8 Mitigation 8: Rare or Protected Plant Species Management Plan

In the event that a protected plant species listed within Annex V of the EU Habitats Directive is identified during the pre-commencement botanical survey, commencement of construction will be placed on hold until a rare plant species management plan has been produced. This management plan will implement management and mitigation measures to prevent construction and operation phase impacts of the proposed development on such individual plants on-site.

The management and mitigation measures stipulated within this rare plant species management plan will be determined by the specific requirements and best practice management relevant to the specific species found. Management/ mitigation measures may involve translocation of the plant, or the isolation of the plant, and/ or utilisation of protective dust and silt measures.

5.13.2.1.9 Mitigation 9: Invasive Species Management Plan (ISMP)

In the event of discovery of any high impact invasive species at the Site following any invasive species survey (such as those included within Mitigation 7 and Mitigation 22) (see Section 5.13.2.1.7 and Section 5.13.3.2.3), commencement of construction would be placed on hold until an invasive species management plan is developed. would include a number of additional management and mitigation measures to avoid and minimise impacts of said invasive species. This ISMP would be informed the results of the pre-commencement invasive species survey findings and by best practice and would include a number of additional management and mitigation measures to avoid and minimise impacts of said invasive species.

5.13.2.1.10 Mitigation 10: Biosecurity

The following best practice site hygiene and biosecurity measures will be in place to avoid spread of invasive species within the site or into the surrounding areas during the construction phase:

- The Proposed Development will only accept inert Article 27-declared material which is clean, inert, greenfield soil and stone. This is therefore highly unlikely to contain invasive plant material, minimising the possibility of introduction of invasive plant materials to the Site as far as possible.
- As a precautionary measure, a post infilling invasive species survey will be undertaken (see Section 5.13.3.2.3)
- Personnel working on or between sites will ensure their clothing and footwear are cleaned, ensuring they are visually free from soil and organic debris, in order to prevent inadvertent spread of invasive plant material.
- Where possible tracked vehicles should not be used within an area of infestation.
- All vehicles leaving the Site and/or transporting infested soil/materials must be thoroughly pressure-washed in a designated wash-down area before being used for other work. Mud and organic debris will not be allowed accumulate on tyres, wheels or under wheel arches.
- All vehicles containing invasive plant materials for transportation and disposal offsite will be suitably secured with tarpaulins etc., to ensure no inadvertent dissemination of invasive materials en-route.

- Works should be planned to avoid double handling of infected plants materials/soils as far as possible to reduce the risk of spread.
- All vehicles entering or leaving the Site will have been suitably checked and pressure-washed to ensure no introduction of invasive flora to and from the Site. Measures such as a drive through hygiene bath or footbaths will be considered where appropriate.
- Designated wash-down area to be located away from sensitive receptors such as watercourses, ditches, drains etc.
- Material/water left after vehicles have been pressure-washed must be contained, collected and disposed of appropriately (These waters **must not** under any circumstances be discharged to drains or the eastern ditch).
- All chemicals used for the control of non-native species should be stored and used in a responsible manner.

5.13.2.2 Protection of Fauna

5.13.2.2.1 Mitigation 11: Pre-felling check of Trees

It is recommended that a pre-felling check of all trees scheduled for removal is undertaken prior to the commencement of vegetation clearance, this is in order to confirm that bat roosting suitability has not changed since the last Site visit. This will include a visual inspection of on-site trees scheduled for removal for the presence of any Potential Roost Features (PRFs) within trees within or close to the Site in adherence to best practice guidelines (Collins, 2016 and Marnell et al., 2022). Should any PRFs be identified, the appropriate additional roost surveys shall be implemented to determine use of the PRF and the NPWS approval obtained accordingly before construction commences.

As for protected small mammals, although no significant nesting hollows were noted as being present in trees at the Site, it is recommended a pre-felling check should be undertaken prior to their removal, to confirm small mammal nesting suitability has not changed since the last Site visit. The protocol in the event of any nesting hollows or dreys will be dealt with as is above for PRFs.

5.13.2.2.2 Mitigation 12: Vegetation Clearance

As the Site has been deemed suitable for bats, breeding birds (incl. the ground nesting meadow pipit), large mammals (Otter), small mammals (Irish hare, Pine Marten, Red Squirrel, Hedgehog, Irish Stoat, Pygmy Shrew), amphibians and Marsh Fritillary, vegetation clearance within the cutover bog, bog woodland and drainage ditch habitats will need to be cognisant of any potentially present fauna.

Table 5-14 provides guidance for when vegetation clearance is permissible in relation to wintering, hibernating and breeding fauna. Information sources include British Hedgehog Preservation Society's *Hedgehogs and Development* and *The Wildlife (Amendment) Act, 2000*.

The preferred period for vegetation clearance is within the months of September and October to avoid the main wintering and breeding bird seasons, amphibian breeding, as well as mammal hibernation.

Seasonal restrictions should be observed wherever possible, where this is not, an appropriate check for by an Ecological Clerk of Works (ECoW) for species likely to be present / breeding / hibernating at the time of works (e.g., winter to check for wintering birds, Feb-Jun check for breeding birds, amphibians, etc) and repeated as required to ensure compliance with legislative requirements.

Each target species requires a different approach if found during ECoW works. Where the ECoW determines that the impact is too high on any of the target species should works continue, the works will be halted and the NPWS and the LCC Biodiversity Officer will be consulted on the best approach to proceed.

Table 5-14: Seasonal restrictions on vegetation removal. Red boxes indicate periods when clearance/ works are not advised.

Ecological Feature	January	February	March	April	May	June	July	August	September	October	November	December	
Breeding Birds	Vegetation clearance permissible		Nesting bird season No clearance of vegetation or works to relevant structures permitted unless confirmed to be devoid of nesting birds by an ecologist.						Vegetation clearance permissible				
Wintering Birds	Wintering Bird Season			Vegetation clearance permissible					Beginning of Wintering Bird Season- Vegetation clearance permissible under supervision of an ecologist.		Wintering Bird Season		
Hibernating mammals (namely hedgehog)	Mammal hibernation season No clearance of vegetation or works to relevant structures permitted unless confirmed to be devoid of hibernating mammals by an ecologist.			Vegetation clearance permissible							Mammal hibernation season No clearance of vegetation or works to relevant structures permitted unless confirmed to be devoid of hibernating mammals by an ecologist.		
Amphibians (namely common frog)		Common Frog breeding season							Vegetation / Site clearance permissible				
Marsh Fritillary (Devils bit	Out of adult flight season				Vegetation clearance permissible		Out of adult flight season						

Scabious habitat removal)			

Additionally, all vegetation clearance will be carried out in sections working in a consistent direction to prevent entrapment of protected fauna potentially present (e.g., hedgehog, pygmy shrew, common frog). A phased cutting approach under the supervision of a suitably qualified ECoW will be used to allow wildlife (small mammals, amphibians and reptiles) to move away from any suitable habitat that will be removed. This will take place during weather that is suitable for reptiles to be active (above 10°C with little rain):

- Phase 1 – Cutting vegetation to 150-200 mm and removing the arisings;
- Phase 2 – After a minimum of one hour, hand-searching the cut areas (conducted by an ECoW) and removing any sheltering habitat (e.g. logs or debris) then cutting vegetation to ground level and removing the arisings; and
- Phase 3 – Soil scrape.

Should any suitable refugia or day nesting habitats need to be removed, this will be carried out outside the most vulnerable breeding periods for the relevant species and will be supervised by the ECoW.

5.13.2.2.3 Mitigation 13: Wildlife Friendly Lighting

No overnight lighting will be directed to the remaining onsite and offsite natural habitats along the north, south, east or west boundary (i.e., the western ditch, the western 10m buffer and the boarder habitat around the perimeter of the Site). Where overnight lighting cannot be avoided in these areas due to health and safety concerns, the lighting within the Proposed Development will be designed and installed to minimise the impact on local wildlife and in accordance with the Bat Conservation Trust guidelines on artificial lighting and bats (BCT 2023):

- There will be no light spill to the boundary habitats.
- All luminaires used will lack UV/IR elements to reduce impact.
- LED luminaires will be used due to the fact that they are highly directional, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (<2700 Kelvins will be used to reduce the blue light component of the LED spectrum).
- Luminaires will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
- Column heights should be carefully considered to minimise light spill. The shortest column height allowed should be used where possible.
- Only luminaires with an upward light ratio of 0% and with good optical control will be used.
- Luminaires will be mounted on the horizontal, i.e. no upward tilt.

- Any external security lighting will be set on motion-sensors and short (1min) timers.
- As a last resort, accessories such as baffles, hoods or louvres will be used to reduce light spill and direct it only to where it is needed.

5.13.2.2.4 Mitigation 14: Pre-commencement Mammal Survey

Prior to the commencement of the works, an updated mammal walkover survey will be completed. This will include a focused search for Otter Holts on-site. Should either feature be identified, the NPWS and the relevant Biodiversity Officer will be consulted to agree an Otter Mitigation Plan for the duration of the Construction and Operational Phase. This plan may include additional measures for monitoring and mitigating habitat loss, noise and disturbance impacts.

5.13.2.2.5 Mitigation 15: Wildlife Conscious Waste and Site Housekeeping

To prevent entrapment of small mammals and amphibians in any newly dug trenches, pits or other excavations (e.g. SuDS manhole excavations), any areas excavated will be refilled prior to end of working day or finished with a low slope on one aspect to allow fauna to escape should they fall in during non-working hours (e.g. at night). Alternatively, the excavations may be covered with a sturdy impermeable cover that will not move should a larger animal step on it.

As best-practice, all construction-related rubbish on-site e.g., plastic sheeting, netting etc. should be kept in a designated area on-site and kept off ground level so as to protect small fauna (such as small mammals, amphibians and reptiles) from entrapment and death.

5.13.2.2.6 Mitigation 16: Pre-construction Amphibian Check

Given the proposed removal of suitable Amphibian habitat within the Site, a check of all drainage ditches scheduled for removal will be undertaken immediately before vegetation clearance takes place.

A precautionary survey will be carried out by the ECoW to ensure that no breeding frogs or other amphibians are present prior to the initiation of clearance and drainage ditch filling works. In the event that amphibians (of any life stage) are detected, they will be captured and transferred carefully to a "safe zone" by the ECoW under best practice guidance consulting relevant authorities as required, before any further vegetation clearance or ditch filling commences.

General amphibian protection measures are as follows:

- Institute and adhere to a code of best practice when operating in the areas in and around the drainage ditches on-site.
- Retain a suitably qualified and licenced ECoW during the Construction Phase to check for amphibians before clearance of small sections.
- Work from one end to another with controlled removal of the scrub areas and hedgerows i.e., sequentially rather than all at once.

5.13.2.2.7 Mitigation 17: Pre-commencement Marsh Fritillary Surveys

A habitat condition survey and larval web survey will be undertaken in early September to determine the presence of Marsh Fritillary at the Site. This is when both Devils Bit Scabious and larval webs are most conspicuous. The surveys should be undertaken pre-construction

by a suitably qualified ecologist in line best practice survey methodology outlined by the NRA and National Biodiversity Data Centre (NRA, 2009; NBDCA, 2026).

The purpose of these surveys is to understand the presence of this species on-site, and/ or to determine how the Site is used by the species should it be present. Areas of any category of suitable habitat or any signs of larval webs will be mapped and presented to the NPWS. As Marsh Fritillary typically live in metapopulations, one main population supported by smaller subpopulations, periods of local extinctions of subpopulations can occur due to temporary factors, and it is important during these extinction events that habitat quality is maintained so the Marsh Fritillary can recolonise the area when populations increase again. If during these periodic extinctions the habitat quality becomes unsuitable, the Marsh Fritillary will not recolonise the area. As such, suitable but currently unoccupied habitat near to recorded existing populations will be mapped and considered to be of significance to local populations.

The outcome of all surveys will be communicated with the NPWS and commencement of construction will begin only once this entity has been consulted on the results and a relevant Marsh Fritillary License has been obtained if so required. It may be necessary to undertake an adult Marsh Fritillary survey during late-May or early June when adult butterflies are on the wing (NRA, 2009; NBDCA, 2026), or, if the habitat condition surveys determine suitable habitat for this species is present on-site, engage in avoidance activities which exclude the plants from the infilling activities to maintain habitat quality for returning populations.

5.13.3 Operational Phase

Given the similarities between the construction and operational phase of the Proposed Development, many of the mitigation measures outlined for the construction phase will continue to apply, where relevant, during the operational phase of the Proposed Development. Mitigation measures which require no change and can be carried forward include:

- 5.13.2.1.1 Mitigation 1: General Dust Control General Dust Control Measures
- 5.13.2.1.2 Mitigation 2: Dust Control – Site Roads and Track Out
- 5.13.2.1.3 Mitigation 3: Control and Management of Surface Water Runoff
- 5.13.2.1.6 Mitigation 6: Tree retention and Protection
- 5.13.2.1.10 Mitigation 10: Biosecurity
- 5.13.2.2.3 Mitigation 13: Wildlife Friendly Lighting
- 5.13.2.2.5 Mitigation 15: Wildlife Conscious Waste and Site Housekeeping

All further mitigation measures laid out below are modified or additional mitigation measures which will be implemented for the operational phase of the Proposed Development.

5.13.3.1 Protection of Habitats

5.13.3.1.1 Mitigation 18: Operational Phase Dust Screening

Adequate dust/debris screening will be in place at the site boundary to contain and minimise the amount of windblown dust. This will be maintained in good condition at all times. This will include:

- Erection of solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiled materials on site.
- Full enclosure of specific operations where there is a high potential for dust production and the site is active for an extensive period.
- Dust suppression equipment must be used when point source emissions are likely. The site will be dampened down as necessary to minimise windblown dust when necessary or during periods of dry weather. Where dust is likely to be a persistent problem a water spray system (e.g., IBC tanks fitted with hoses, bowsers fitted with spray nozzles) will be put in place from the commencement of the works where required. Hard to reach areas will be kept wet by the use of water cannons fitted to the rear of the bowsers.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Netting of scaffolding will be undertaken as required
- Covering skips and slack heaps

Remove materials that have a potential to produce dust from site as soon as possible.

5.13.3.1.2 Mitigation 19: Mitigation 5: Construction phase Surface Water Control for Aquatic Habitat.

In order to provide specific protection to the adjacent, hydrologically linked drainage ditches to the Site, the following measures will be observed throughout construction:

- Silt fences along drainage ditches will remain in place throughout the Operational phase.
- Western most drainage ditch:
 - A 10-meter buffer and silt fence will be maintained along the western drainage ditch, where no soil deposition shall take place to protect surface waters and to ensure that there are no offsite nuisances created by the site.
- Adjacent drainage ditch habitat to infilling activities
 - Any displaced water during the infilling of the drainage ditches will be allowed to infiltrate to ground in the immediate surrounding area. In-ditch drainage runoff controls such as silt fences and traps at the point where the site boundary intercepts any drainage ditch along the northern or southern boundary should remain in-place for the duration of the operation phase. Where required, drainage runoff controls such as silt fences and silt traps and additional such devices will be provided where required.
 - Buffer zones silt fencing or bunding along the length of the open drainage ditches during the construction phase will be maintained on-Site until the point of infill of the drainage ditch, at which point careful removal shall be undertaken. This is to prevent the silting and compaction of the filter materials within the drainage ditch which in turn will help maintain the outflow of water to adjacent ditch habitats.

- Following careful removal of the silt fencing along these drainage ditches, vehicle restrictions within this buffer will remain observed, and all material placed atop of the infilled drainage features shall be deposited by end tipping without compaction.
- Any machines working in the vicinity of the drainage ditches will continue to be protected against leakage or spillage of fuels, oils, greases and hydraulic fuels.
- All trucks leaving the site will pass through a dry wheel wash, thereby removing the potential for transport of sediment offsite. The wheel wash will be periodically cleaned out and its contents will be disposed of in the appropriate manner by a suitably licensed waste contractor and never discharged onsite.
- The silt fences around the periphery of the infilling area will also be retained throughout the duration for the operational phase in order to continue to protect adjacent habitats including the drainage ditches and cutover bog and bog woodland habitat.
- No planting of trees during re-naturalisation of the Site should occur over the drainage ditches, as to avoid compaction of soil and subsequent impact to flow to adjacent drainage ditch habitat.

All silt fences will continue to be monitored to ensure that they remain functional throughout. Where necessary, maintenance will be carried out on the fences to ensure that they continue to be effective. This will be particularly important after heavy rainfall events. The checks will be undertaken by the Environmental Manager. The frequency of monitoring will depend on the stage of works, and local environmental conditions. Daily checks may be appropriate during the initial site clearance, during works in the vicinity of the drainage ditches and during and after storm events. Weekly or bi-weekly checks may be appropriate at other times.

Upon completion of the operational phase, all silt fences remaining will be carefully removed. All works carried out in or adjacent to the drainage ditches will adhere to the Inland Fisheries Ireland (IFI) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters (IFI, 2016), the Transport Infrastructure Ireland (TII) Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (TII, 2008) and CIRIA C648 Control of Water Pollution from Linear Construction Projects (CIRIA, 2006).

All near stream works will include the following measures:

- Silt fences and other sediment control measures will be utilised as required to prevent sedimentation in the drainage ditches.
- Entry to the drainage ditches by vehicles beyond the silt fences will not be permitted, while vehicle usage along the banks will be restricted as much as practicable. Any machines working in close proximity of the watercourse must be protected against leakage or spillage of fuels, oils, greases and hydraulic fuels.
- Works will be carried out from the bank side, as best practice in-stream works will be restricted to the period 1st July through 30th September, to comply with the seasonal restrictions in salmonid rivers.

5.13.3.2 Protection of Fauna

5.13.3.2.1 Mitigation 20: Amphibian Notification Protocol

In the event that Amphibian individuals or signs of such species are identified within any areas of pooling water on-site, the NPWS and the relevant Biodiversity Officer will be contacted and a translocation of the Species in line with best practice measures will be arranged before infilling activities within range continue.

5.13.3.2.2 Mitigation 21: Annual Marsh Fritillary Surveys of Lands to be Infilled

Annual habitat suitability surveys, larval web surveys and adult surveys for Marsh Fritillary will continue to occur throughout the duration of the operational phase (see methodology requirements in Section 5.13.2.2.7) as fluctuating populations may return to utilise suitable habitats on Site. NPWS will be engaged throughout this process. .

In the event of observations of new Devils Bit Scabious individuals or Marsh Fritillary individuals on-Site, the NPWS and the relevant Biodiversity Officer will be re-contacted, and infilling will be placed on hold until these entities have been consulted on the best approach to proceed.

Additional mitigation or enhancement measures may also be required based off of the pre-construction phase consultations with the NPWS.

5.13.3.2.3 Mitigation 22: Annual Botanical Survey of Lands to be Infilled

Annual botanical surveys of lands to be infilled following the year in which construction is undertaken will be conducted. This will be undertaken within the main botanical growing season between March and October (NRA 2009) and will consist of a systematic search and recording of any flora classified as invasive, rare or protected (e.g. under Annex V of the EU habitats directive). Depending on the findings of this survey, further mitigation as outlined within Section 5.13.2.1.8 or Section 5.13.2.1.9 may be required for the remainder of the operational phase.

5.13.4 Biodiversity Enhancement Measures

5.13.4.1 Biodiversity Enhancement by Design

Following the infilling the Site will be reseeded with a native grassland meadow mix. Left to grow, flower and form tussocks this grassland habitat will provide pollinator foraging habitat as well as ample nesting grounds for small mammal which in turn will increase prey and foraging area for Pine Marten. It will also provide suitable habitat for ground nesting and wintering birds including meadow pipit and wintering snipe through the provision of grass tussocks. This habitat type will also provide commuting ground for mammals including otter to traverse the site and reach surrounding drainage ditches.

The design of the Proposed Development also includes for the planting of scrub and native tree cuttings, sourced from vegetation clearance, to be scattered around the perimeter of the Site at a depth of 5m to enhance the native woodland cover following infilling. The offcut boughs/branches/stumps of onsite material will be placed along the Site periphery and will undergo semi covering with c. 150mm of topsoil. These cuttings will include willow and birch species which are prone hardwood propagation in this environment. This will provide small mammals with sheltering and nesting habitat as above and provide nesting for breeding birds.

5.13.4.2 Enhancement 1: Bat Boxes

Two summer bat boxes (e.g., Woodcrete 1FF design) will be erected on suitably sized trees within the retained treelines, with one to be placed at the western boundary buffer strip of the Proposed Development Site, and the other within the northern treeline; the exact placement of which will be determined by the ECoW.

Bat boxes will be sited carefully, and this will be undertaken by a bat specialist. Bat boxes will be erected prior to construction works. The bat ecologist will erect the bat boxes with assistance from the contractor. Some general points that will be followed include:

- Bat boxes will be erected on trees (or telegraph poles) with no crowding branches or other obstructions for at least 1 metre above and below the bat box.
- Diameter of tree should be wide and strong enough to hold the required number of boxes.
- Locate bat boxes in areas where bats are known to forage or adjacent to suitable foraging areas. Locations will be sheltered from prevailing winds.
- Bat boxes will be erected at a height of 4-5 metres to reduce the potential for vandalism and predation of roosting bats.

The recommended Woodcrete 1FF design is open at the bottom, allowing the droppings to fall out, and so does not need cleaning.

5.13.4.3 Enhancement 2: Additional planting of native trees

An area within the west of the Site adjacent to the retained buffer will be planted with a number of Scots Pine and other native tree species such as silver birch (*Betula pendula*) and willow (*Salix Sp.*). The final planting schedule will be added to the proposed mitigations and management plan by the ECoW. Planting of this species of tree will eventually provide resting and nesting habitat for Pine Marten and Squirrel.

5.13.4.4 Enhancement 3: Pine Marten Nesting Box

A Pine Marten Nesting Box will be placed under guidance of the ECoW for the Site. The box will be sited 4m high on a mature tree within the bog woodland remaining on the periphery of the Site. Trees for attaching boxes should be selected carefully to minimise the risk of interference or disturbance. Only trees along the northeastern and western boundary away and out of sight of public roads or footpaths and away from areas targeted for woodland management or harvesting in the near future (Vincent Wildlife Trust, 2014).

5.13.4.5 Enhancement 4: Red Squirrel Nest Box

A red squirrel nest box will be placed under the guidance of the ECoW for the Site. The box will be sited between 3m-4m high on a mature tree within the bog woodland remaining on the periphery of the Site. The box should be facing away from both direct sunlight and prevailing weather and be half filled with dehydrated nesting material such as leaves, straw or hay (TIG, 2026).

Supporting and encouraging Red Squirrel to Site will increase the prey species available for Pine Marten, which, as discussed may not be using the Site but have been recorded within the area. Supporting Red Squirrel on-site may also encourage the regrowth of native trees, as their presence on-site will increase active hoarding and incidental growth of tree seeds over

large areas. This, in turn, will provide additional foraging, nesting and resting habitat for protected small mammals within the area such as Pine Marten and Red Squirrel.

5.14 Monitoring

A suitably qualified ECoW will be employed before commencement and for the duration of the Construction Phase; to provide ecological advice and input to the construction team. The ECoW will carry out the monitoring activities listed above for the duration of the construction and operational Phase of the Proposed Development. Details of all species-specific monitoring both pre-, during and post-construction, will be provided to the CoCo for their records:

NOTE: The ECoW will be employed several weeks before commencement of works on Site; to allow time for the scope of ECoW works to be reviewed by the ecologist and any necessary pre-construction surveys to be carried out.

All surveys, Site inspections and supervised works requirements outlined within the mitigation measures outlined within this chapter will be incorporated into a Mitigation and Management Plan. This plan will lay out the responsibilities of the Site Manager and ECoW throughout the construction and operational phases of the Proposed Development.

Table 5-15 below provides a summary of the required monitoring and pre-works inspections during the construction and operational phases of the Proposed Development. The monitoring, inspections and surveys will ensure that the identified mitigation measures are implemented and maintained efficiently and have the desired effect of protecting the local ecology from adverse impacts.

Table 5-15: Monitoring and pre-works inspections for the identified mitigation measures during the construction and operation phases of the Proposed Development. To be carried out by a suitably qualified Ecologist or Ecological Clerk of Works (highlighted) or by the development contractor (no highlight)

Measure	Monitoring
CONSTRUCTION PHASE	
Mitigation 1: General Dust Control Measures	Ongoing monitoring by contractor.
Mitigation 2: Dust Control – Site Roads and Track Out	Ongoing monitoring by contractor.
Mitigation 3: Control & Management of Surface Water Runoff	Ongoing monitoring by contractor.
Mitigation 4: Management Infilling of Drainage Ditches	Ongoing monitoring by contractor and ECoW
Mitigation 5: Construction Phase Surface Water Control for Adjacent Habitats	Ongoing monitoring by contractor and ECoW

Mitigation 6: Tree retention & Protection	Confirmed with ECoW. Monitored by contractor.
Mitigation 7: Pre-commencement Botanical Survey	Undertaken by ECoW
Mitigation 8: Rare or Protected Plant Species Management Plan	Implementation overseen by ECoW if required
Mitigation 9: Invasive Species Management Plan	Implementation overseen by ECoW if required
Mitigation 10: Biosecurity	Ongoing monitoring by contractor.
Mitigation 11: Pre-felling check of trees	Undertaken by ECoW
Mitigation 12: Vegetation Clearance	ECoW will be present throughout vegetation clearance activities and carry out necessary checks.
Mitigation 13: Wildlife Friendly Lighting	Plan to be reviewed by ECoW. Implemented and monitored by contractor
Mitigation 14 : Pre-commencement Mammal Survey	Undertaken by ECoW
Mitigation 15: Wildlife Conscious Waste & Site Housekeeping Measures	Ongoing monitoring by contractor.
Mitigation 16: Pre-construction Amphibian Check	Undertaken by ECoW
Mitigation 17: Pre-commencement Marsh Fritillary Surveys	Undertaken by ECoW
OPERATIONAL PHASE	
Mitigation 1: General Dust control measures	Ongoing monitoring by contractor.
Mitigation 2: Dust Control – Site Roads and Track Out	Ongoing monitoring by contractor.
Mitigation 3: Control & Management of Surface Water Runoff	Ongoing monitoring by contractor.
Mitigation 6: Tree retention & Protection	Confirmed with ECoW. Monitored by contractor.
Mitigation 10: Biosecurity	Ongoing monitoring by contractor.
Mitigation 13: Wildlife Friendly Lighting	Plan to be reviewed by ECoW. Implemented and monitored by contractor
Mitigation 19: Operational Surface Water Control for Adjacent Habitats	Ongoing monitoring by contractor and ECoW

Mitigation 20: Amphibian Notification Protocol	Sporadic checks by ECoW
Mitigation 21: Annual Marsh Fritillary Surveys of Lands to be Infilled	Undertaken by ECoW
Mitigation 22: Annual Botanical Surveys of Lands to be Infilled	Undertaken by ECoW
Enhancement 1: Bat Boxes	The placement and construction of these structures should be carried out under supervision of an ECoW to ensure they are fit for purpose.
Enhancement 2: Additional Planting of Native Trees	Confirmed with ECoW.
Enhancement 3: Pine Marten Nesting Box	The placement and construction of these structures should be carried out under supervision of an ECoW to ensure they are fit for purpose.
Enhancement 4: Red Squirrel Nesting Box	The placement and construction of these structures should be carried out under supervision of an ECoW to ensure they are fit for purpose.
Enhancement 5: Planting of Devils Bit Scabious	The placement and construction of these plants should be carried out under supervision of an ECoW to ensure they are planted within suitable conditions to survive and support Marsh Fritillary.

5.15 “Worst Case” Scenario

The worst case scenario for the Proposed Development area including all lands within the clients ownership at the Kyletalesha infilling Site is defined as the development of the lands within this boundary as described and coinciding with other plans and projects as detailed in Section 11.8.3.

Taking into account the mitigation measures and the residual impacts that remain, the impacts on Biodiversity is not significant.

5.16 Residual Impacts

Residual impacts are impacts that remain once mitigation has been implemented or impacts that cannot be mitigated. *Table 5-16* below provides a summary of the impact assessment for the identified KERs and details the nature of the impacts identified, the mitigation measures proposed, and the classification of any residual impacts.

Both standard construction/ operational phase control measures, and specific mitigation measures (in the absence of data and results from all surveys), have been outlined to ensure that the Proposed Development has limited impact on any species, habitats or designated sites of conservation importance. It is essential that these measures are complied with, in order to ensure that the Proposed Development complies with National conservation legislation.

Table 5-16: Summary of Potential Impacts on KERs, mitigation proposed and residual impacts

Key Ecological Resource	Evaluation	Potential Impact	Impact Without Mitigation				Proposed Mitigation / Mitigating Factors	Proposed Enhancements	Residual Impact
			Quality	Magnitude / Extent	Duration	Significance			
DESIGNATED SITES									
River Barrow and River Nore SAC (002162)	International Importance	Construction Ex-situ habitat loss to Otter	Negative	International	Medium-term	Imperceptible	None	None	Imperceptible
		Operation None	None	None	None	None	None		
Clonreher Bog NHA (002357)	National Importance	Construction Dust contamination via possible direct air pathway.	Neutral	National	Short-term	Imperceptible	None	None	Imperceptible
		Operation Dust pollution from transfer via indirect air pathway from vehicles carrying infill material past NHA	Negative	National	Short-term	Significant	Mitigation 2: Dust control – Site Roads and Track Out		
pNHAs including Dunamase Wood Rock Of Dunamase Kiltale Hill	National Importance	Construction Impacts due to possible hydrogeological connection	None	None	None	None	None	None	Imperceptible

Ridge of Portlaoise									
Derries Wood pNHA	National Importance	<u>Construction</u> Loss of ex-situ habitat	Negative	National	Short-term	Slight	None	Enhancement 2: Additional Planting of Native Trees (incl. Scots Pine)	Imperceptible
		<u>Operation</u> None	None	None	None	None	None	Enhancement 3: Pine Marten Nesting Box None	
HABITATS									
Cutover Bog (PB4)	Local Importance (Higher Value)	<u>Construction</u> Loss of habitat	Negative	Local	Slight	Permanent	None	None	Negative, local, permanent, slight
		Damage due to dust impacts	Negative	Local	Moderate	Short term	Mitigation 1: General Dust Control Measures Mitigation 2: Dust control: Site Roads & Track out		

		Damage due to accidental pollution release	<i>Negative</i>	<i>Local</i>	<i>Moderate</i>	<i>Short term</i>	Mitigation 3: Control & Management of Surface Water Runoff		
		<u>Operation</u> Damage due to dust impacts	<i>Negative</i>	<i>Local</i>	<i>Significant</i>	<i>Long-term</i>	Mitigation 1: General Dust Control Measures Mitigation 2: Dust control: Site Roads & Track out Mitigation 18: Operational Phase Dust Screening		
		Damage due to accidental pollution release	<i>Negative</i>	<i>Local</i>	<i>Significant</i>	<i>Long-term</i>	Mitigation 3: Control & Management of Surface Water Runoff		
Bog Woodland (WN7)	Local Importance (Higher Value)	<u>Construction</u> Habitat Loss	<i>Negative</i>	<i>Local</i>	<i>Slight</i>	<i>Permanent</i>	None		
		Accidental Root Damage and soil compaction for flora	<i>Negative</i>	<i>Local</i>	<i>Significant</i>	<i>Short term y</i>	Mitigation 6: Tree retention and Protection	None	Negative, local, short-term, slight
		Damage due to dust impacts	<i>Negative</i>	<i>Local</i>	<i>Moderate</i>	<i>Short term</i>	Mitigation 1: General Dust Control Measures		

		Damage due to accidental pollution release Operation Accidental Root Damage and soil compaction for flora Damage due to dust impacts Damage due to accidental pollution release	Negative Negative Negative Negative	Local Local Local Local	Moderate Significant Significant Significant	Short term y Long term Long term Long term	Mitigation 2: Dust control: Site Roads & Track out Mitigation 3: Control & Management of Surface Water Runoff Mitigation 6: Tree retention and Protection Mitigation 1: General Dust Control Measures Mitigation 2: Dust control: Site Roads & Track out Mitigation 18: Operational Phase Dust Screening Mitigation 3: Control & Management of Surface Water Runoff		
Western Drainage Ditch (FW4)	Local Importance (Higher Value)	Construction Water quality reduction due to entry of	Negative	Local	Significant	Short term	Mitigation 3: Control & Management of Surface Water Runoff	None	Imperceptible

		contaminated surface and groundwaters							
		Damage due to dust impacts	<i>Negative</i>	<i>Local</i>	<i>Moderate</i>	<i>Short term</i>	Mitigation 1: General Dust Control Measures Mitigation 2: Dust control: Site Roads & Track out		
		<u>Operation</u> Water quality reduction due to entry of contaminated surface and groundwaters	<i>Negative</i>	<i>Local</i>	<i>Significant</i>	<i>Short-term</i>	Mitigation 3: Control & Management of Surface Water Runoff		
		Damage due to dust impacts	<i>Negative</i>	<i>Local</i>	<i>Significant</i>	<i>Short-term</i>	Mitigation 1: General Dust Control Measures Mitigation 2: Dust control: Site Roads & Track out Mitigation 18: Operational Phase Dust Screening		
Drainage Ditches (FW4)	Local Importance (Higher Value)	<u>Construction</u> Habitat Loss	<i>Negative</i>	<i>Local</i>	<i>Slight</i>	<i>Permanent</i>	None	None	Negative, local, permanent, slight

		<u>Operation</u> None	None	None	None	None			
Adjacent Bog Woodland and Cutover Bog Mosaic Habitat	Local Importance (Higher Value)	<u>Construction</u> Accidental Root Damage and soil compaction for flora	Negative	Local	Significant	Short-term	Mitigation 6: Tree retention and Protection	None	Imperceptible
		Damage due to dust impacts	Negative	Local	Moderate	Short term	Mitigation 1: General Dust Control Measures Mitigation 2: Dust control: Site Roads & Track out		
		Damage due to accidental pollution release	Negative	Local	Moderate	Short-term	Mitigation 3: Control & Management of Surface Water Runoff		
		<u>Operation</u> Accidental Root Damage and soil compaction for flora	Negative	Local	Significant	Long term	Mitigation 6: Tree retention and Protection Mitigation 1: General Dust Contril Measures		
		Damage due to dust impacts	Negative	Local	Significant	Long term	Mitigation 2: Dust control: Site Roads & Track out		

		Damage due to accidental pollution release	<i>Negative</i>	<i>Local</i>	<i>Significant</i>	<i>Long term</i>	Mitigation 18: Operational Phase Dust Screening Mitigation 3: Control & Management of Surface Water Runoff		
Adjacent Drainage ditches	Local Importance (Higher Value)	Construction Water quality reduction due to entry of contaminated surface and groundwaters Damage due to dust impacts	<i>Negative</i> <i>Negative</i>	<i>Local</i> <i>Local</i>	<i>Significant</i> <i>Moderate</i>	<i>Short-term</i> <i>Short-term</i>	Mitigation 3: Control & Management of Surface Water Runoff Mitigation 4: Management of Infilling of Drainage Ditches Mitigation 5: Construction phase Surface Water Control for Aquatic Habitat Mitigation 1 General Dust Control Measures Mitigation 2: Dust control: Site Roads & Track out	None	Imperceptible

		Water flow impediment into habitat	<i>Negative</i>	<i>Local</i>	<i>Significant</i>	<i>Short-term</i>	Mitigation 3: Control & Management of Surface Water Runoff Mitigation 4: Management of Infilling of Drainage Ditches Mitigation 5: Construction phase Surface Water Control for Aquatic Habitat		
		<u>Operation</u> Water quality reduction due to entry of contaminated surface and groundwaters	<i>Negative</i>	<i>Local</i>	<i>Significant</i>	<i>Short-term</i>	Mitigation 3: Control & Management of Surface Water Runoff Mitigation 19: Operational Surface Water control for Adjacent Habitats		
		Damage due to dust impacts	<i>Negative</i>	<i>Local</i>	<i>Significant</i>	<i>Short-term</i>	Mitigation 1: General Dust Control Measures Mitigation 2: Dust control: Site Roads & Track out		

		Water flow impediment into habitat	Negative	Local	Significant	Short-term	Mitigation 18: Operational Phase Dust Screening Mitigation 19: Operational Surface Water control for Adjacent Habitats		
Triogue River	Local Importance (Higher Value)	Construction Water quality reduction due to entry of contaminated surface and groundwaters	Negative	Local	Significant	Short-term	Mitigation 3: Control & Management of Surface Water Runoff Mitigation 5: Construction phase Surface Water Control for Aquatic Habitat	None	Imperceptible
		Water quality reduction due to entry of dust	Negative	Local	Moderate	Temporary	Mitigation 1: General Dust Control Measures Mitigation 2: Dust control: Site Roads & Track out		
		Operation Water quality reduction due to entry of contaminated surface and groundwaters	Negative	Local	Significant	Short-term	Mitigation 3: Control & Management of Surface Water Runoff Mitigation 19: Operational Surface		

		Water quality reduction due to entry of dust	<i>Negative</i>	<i>Local</i>	<i>Significant</i>	<i>Short-term</i>	Water control for Adjacent Habitats Mitigation 1: General Dust Control Measures Mitigation 2: Dust control: Site Roads & Track out Mitigation 18: Operational Phase Dust Screening		
River Barrow	Local Importance (Higher Value)	<u>Construction</u> Water quality reduction due to entry of contaminated surface and groundwaters into hydro pathway <u>Operation</u> Water quality reduction due to entry of contaminated surface and groundwaters into hydro pathway	<i>Neutral</i>	<i>Local</i>	<i>Imperceptible</i>	<i>Short-term</i>	None	None	Imperceptible
			<i>Neutral</i>	<i>Local</i>	<i>Imperceptible</i>	<i>Long-term</i>	None		

Rare & Protected Flora	Local Importance (Higher Value)	Construction Damage due to dust impacts	Negative	International	Significant	Long-term	Mitigation 1: General Dust Control Measures	None	Imperceptible
		Physical Damage	Negative	International	Significant	Long-term	Mitigation 2: Dust control: Site Roads & Track out Mitigation 7: Pre-commencement Botanical Survey		
		Operation Damage due to dust impacts	Negative	International	Significant	Long term	Mitigation 8: Rare or Protected Plant Species Management Plan Mitigation 1: General Dust Control Measures		
		Physical Damage following re-colonisation	Negative	International	Significant	Long term	Mitigation 2: Dust control: Site Roads & Track out Mitigation 18: Operational Phase Dust Screening Mitigation 22: Annual Botanical Survey of lands to be infilled :		

Invasive Flora	Local Importance (Higher Value)	Construction Spread of invasive species in and around Site	Negative	Local	Significant	Long-term	Mitigation 7: Pre-commencement Botanical survey (to include search for invasives)	None	Imperceptible
		Operation Spread of invasive species in and around Site	Negative	Local	Significant	Long-term	Mitigation 9: Invasive Species Management Plan Mitigation 10: Biosecurity Mitigation 10: Biosecurity Mitigation 22: Annual Pre-Infilling Botanical Survey		
FAUNA									
Bat Assemblage	Local Importance (Higher Value)	Construction Physical disturbance, injury or death caused by inadvertent removal of an active PRF	Negative	Local	Significant	Short-term	Mitigation 11: Pre-felling check of trees	Enhancement 1: Bat Boxes Enhancement 2: Additional Planting of	Negative, Local, Long-term, Slight
		Construction/Operation Habitat loss	Negative	Local	Slight	Long-term	None		

		Construction/ Operational phase lighting disturbance	<i>Negative</i>	<i>Local</i>	<i>Moderate</i>	<i>Short-term</i>	Mitigation 13: Wildlife Friendly Lighting	Native Trees (incl. Scots Pine) None	
Breeding Bird Assemblage	Local Importance (Higher Value)	Construction Habitat loss	<i>Negative</i>	<i>Local</i>	<i>Significant</i>	<i>Short-term</i>	None	Enhancement 2: Additional Planting of Native Trees (incl. Scots Pine)	Negative, Local, Long- term, Slight
		Potential injury and mortality from site clearance.	<i>Negative</i>	<i>Local</i>	<i>Significant</i>	<i>Short-term</i>	Mitigation 12: Vegetation Clearance		
		Disturbance from noise, dust, increased activity and lighting	<i>Negative</i>	<i>Local</i>	<i>Significant</i>	<i>Temporary</i>	Mitigation 1: General Dust Control Measures Mitigation 2: Dust control: Site Roads & Track out		
		Operation Disturbance from noise, dust, increased activity and lighting.	<i>Negative</i>	<i>Local</i>	<i>Significant</i>	<i>Short-term</i>	Mitigation 13: Wildlife Friendly Lighting Mitigation 18: Operational Phase Dust Screening		
Wintering Bird Assemblage	Local Importance (Higher Value)	Construction Habitat loss	<i>Negative</i>	<i>Local</i>	<i>Significant</i>	<i>Short-term</i>	None	Enhancement 2: Additional	

		Potential injury and mortality from site clearance.	<i>Negative</i>	<i>Local</i>	<i>Significant</i>	<i>Short-term</i>	Mitigation 12: Vegetation Clearance	Planting of Native Trees (incl. Scots Pine)	
		Disturbance from noise, dust, increased activity and lighting	<i>Negative</i>	<i>Local</i>	<i>Significant</i>	<i>Temporary</i>	Mitigation 1: General Dust Control Measures		
							Mitigation 2: General Dust control Measures		
		Operation Disturbance from noise, dust, increased activity and lighting	<i>Negative</i>	<i>Local</i>	<i>Significant</i>	<i>Short-term</i>	Mitigation 13: Wildlife Friendly Lighting		
							Mitigation 18: Operational Phase Dust Screening		
Otter	Local Importance (Higher Value)	Construction Potential injury and mortality from site clearance.	<i>Negative</i>	<i>Local</i>	<i>Significant</i>	<i>Long-term</i>	Mitigation 14: Pre-commencement Mammal Survey (incl. search for holts)	None	Negative, Local, Long-term, Slight
							Mitigation 15: Wildlife conscious waste and site housekeeping		
		Habitat Loss	<i>Negative</i>	<i>Local</i>	<i>Not significant</i>	<i>Short-term</i>	None		
		Noise Disturbance	<i>Negative</i>	<i>Local</i>	<i>Not significant</i>	<i>Temporary</i>	None		

		Disturbance from water quality impacts	<i>Negative</i>	<i>Local</i>	<i>Moderate</i>	<i>Temporary</i>	Mitigation 3: Control & Management of Surface Water Runoff Mitigation 4: Management of infilling of Drainage Ditches Mitigation 5: Construction phase surface water runoff Mitigation 1: General Dust Control Measures		
		<u>Operation</u> Disturbance from dust	<i>Negative</i>	<i>Local</i>	<i>Significant</i>	<i>Short-term</i>	Mitigation 2: Dust control: Site Roads & Track out Mitigation 18: Operational Phase Dust Screening		
		Disturbance from water quality impacts	<i>Negative</i>	<i>Local</i>	<i>Significant</i>	<i>Short-term</i>	Mitigation 3: Control & Management of Surface Water Runoff Mitigation 4: Management of infilling drainage ditches		

							Mitigation 5: Construction phase surface water runoff		
Irish Hare	Local Importance (Higher Value)	Construction Potential injury and mortality from site clearance	Negative	Local	Significant	Short-term	Mitigation 12: Vegetation clearance Mitigation 14: Pre- commencement Mammal Survey Mitigation 15: Wildlife conscious waste and site housekeeping		Negative, Local, Short term, Slight
		Loss of foraging and commuting habitat.	Negative	Local	Slight	Short term	None		
		Noise disturbance	Negative	Local	Slight	Temporary	None		
		Operation Potential injury and mortality	Negative	Local	Significant	Short-term	Mitigation 15: Wildlife conscious waste and site housekeeping		
		Disturbance from noise & dust	Negative	Local	Significant	Short-term	Mitigation 1: General Dust Control Measures Mitigation 2: Dust control: Site Roads & Track out		

							Mitigation 18: Operational Phase Dust Screening		
Pine Marten	Local Importance (Higher Value)	Construction Potential injury and mortality from site clearance	Negative	Local	Significant	Short-term	Mitigation 11: Pre-felling check of trees	Enhancement 2: Additional Planting of Native Trees (incl. Scots Pine) Enhancement 3: Pine Marten Nesting box	Negative, Local, Long-term, Slight
		Habitat loss	Negative	Local	Slight	Long-term	Mitigation 14: Pre-commencement Mammal Survey Mitigation 15: Wildlife conscious waste and site housekeeping None		
		Noise disturbance	Negative	Local	Slight	Temporary	None		
		Operation Potential injury and mortality	Negative	Local	Significant	Short-term	Mitigation 15: Wildlife conscious waste and site housekeeping		
		Disturbance from noise & dust	Negative	Local	Significant	Short-term	Mitigation 1: General Dust Control Measures Mitigation 2: Dust control: Site Roads & Track out		

							Mitigation 18: Operational Phase Dust Screening		
Red Squirrel	Local Importance (Higher Value)	<u>Construction</u> Potential injury and mortality from site clearance	Negative	Local	Significant	Short-term	Mitigation 11: Pre- felling check of trees Mitigation 14: Pre- commencement Mammal Survey Mitigation 15: Wildlife conscious waste and site housekeeping		Negative, Local, Long term, Slight
		Habitat loss	Negative	Local	Slight	Long-term	None	Enhancement 2: Additional Planting of Native Trees (incl. Scots Pine) .	
		Noise disturbance	Negative	Local	Slight	Temporary	None	Enhancement 4: Red Squirrel Nesting box	
		<u>Operation</u> Potential injury and mortality	Negative	Local	Significant	Short-term	Mitigation 15: Wildlife conscious waste and site housekeeping		

		Disturbance from noise & dust	Negative	Local	Significant	Short-term	Mitigation 1: General Dust Control Measures Mitigation 2: Dust control: Site Roads & Track out Mitigation 18: Operational Phase Dust Screening		
Small Mammals (including European Hedgehog, Irish Stoat and European Pygmy Shrew)	Local Importance (Higher Value)	<u>Construction</u> Potential injury and mortality from site clearance <u>Operation</u> Potential injury and mortality	Negative Negative	Local Local	Significant Significant	Short-term Short-term	Mitigation 12: Vegetation clearance Mitigation 14: Pre-commencement Mammal Survey Mitigation 15: Wildlife conscious waste and site housekeeping		Negative, Local, Short term, Slight
Amphibians	Local Importance (Higher Value)	<u>Construction</u> Potential injury and mortality from site clearance Disturbance from water quality impacts	Negative Negative	Local Local	Significant Moderate	Short-term Temporary	Mitigation 16: Pre-construction amphibian check Mitigation 20: Amphibian notification protocol Mitigation 3: Control & Management of		Negative, Local, Short term, Slight

		<u>Operation</u> Potential injury and mortality Disturbance from dust and water quality impacts	<i>Negative</i> <i>Negative</i>	<i>Local</i> <i>Local</i>	<i>Significant</i> <i>Significant</i>	<i>Short-term</i> <i>Short-term</i>	Surface Water Runoff Mitigation 4: Management of infilling drainage ditches Mitigation 5: Construction phase surface water runoff Mitigation 20: Amphibian notification protocol Mitigation 1: General Dust Control Measures Mitigation 2: Dust control: Site Roads & Track out Mitigation 18: Operational Phase Dust Screening Mitigation 19: Operational Surface Water control for adjacent habitats		
<u>Fauna of the Barrow & Triogue River:</u>	Local Importance (Higher Value)	<u>Construction/ Operation</u>	<i>Negative</i>	<i>Local</i>	<i>Significant</i>	<i>Short-term</i>	Mitigation 3: Control & Management of		Negative, Local, Short term, Slight

White clawed crayfish Freshwater Pearl Mussel Fish Assemblage		Disturbance from water quality impacts					Surface Water Runoff Mitigation 5: Construction phase surface water runoff Mitigation 19: Operational Surface Water control for adjacent habitats		
Marsh Fritillary	County Importance	<u>Construction</u> Habitat loss Potential injury and mortality from site clearance Disturbance from dust impacts <u>Operation</u> Potential injury and mortality Disturbance from dust impacts	<i>County</i> <i>Negative</i> <i>Negative</i> <i>Negative</i> <i>Negative</i>	<i>Local</i> <i>County</i> <i>County</i> <i>County</i>	<i>Significant</i> <i>Significant</i> <i>Moderate</i> <i>Significant</i> <i>Significant</i>	<i>Long-term</i> <i>Long-term</i> <i>Temporary</i> <i>Short-term</i> <i>Short-term</i>	Mitigation 7: Pre-commencement botanical survey Mitigation 17: Pre-commencement Marsh Fritillary surveys Mitigation 21: Annual Marsh Fritillary Surveys of Lands to be Infilled Mitigation 1: General Dust Control Measures	.	Negative, Local, Short term, Slight

							Mitigation 2: Dust control: Site Roads & Track out		
							Mitigation 18: Operational Phase Dust Screening		

5.17 Interactions

5.17.1 Air Quality

An assessment of the potential impact of the Proposed Development on air quality and climate is included in Chapter 8 of this EIAR. Dust emissions arising from the Construction Phase of the Proposed Development were identified as having potential impacts on local biodiversity. Once dust minimisation measures are implemented, impacts to biodiversity are not predicted to be significant.

5.17.2 Hydrology and Hydrogeology

The key environmental interaction with biodiversity is water. An assessment of the potential impact of the Proposed Development on the hydrological and hydrogeological environment is described in Chapter 7 - 'Hydrology' of this report, to ensure the quality (pollution and sedimentation) and quantity (surface water run-off) of water is of appropriate standard. Interactions between hydrology and biodiversity can occur through impacts to water quality, arising, for example from an accidental pollution event during the Construction and Operational Phase.

5.17.3 Conclusion

There are interactions between this biodiversity chapter and the air quality, hydrology, and hydrogeology chapters due to the assessment of potential pathways to European sites, designated sites and aquatic environments via air, hydrological and hydrogeological pathways. The air, groundwater and surface water pathways discussed in these chapters are considered applicable to this chapter with regard to S-P-R pathways. Any mitigation or considerations of the air, ground and surface water pathways contained within those chapters are relevant to the biodiversity assessment with regard to the aquatic environment. There are no interactions foreseen which could pose a risk due to accumulation of multiple non-significant effects resulting from the Proposed Development on the lands within the EIAR study area.

5.18 Difficulties Encountered When Compiling

No difficulties were encountered while compiling this chapter other than the limitations set out in Section 5.9.

5.19 Conclusion

It is considered that, provided the mitigation measures proposed within this report are carried out in full, there will be limited and less than significant impacts to KER habitats, species groups or biodiversity as a result of the Proposed Development. This includes Clonreher Bog NHA, for which any direct or indirect impacts were assessed and mitigated as to reduce any possible impacts to be imperceptible.

It is proposed to retain a 10m buffer at the west of the Site, as well as a small boarder of bog woodland and cutover bog around the periphery. This will offset impacts on the western drainage ditch receptor and subsequent Triogue River connected to the Site and preserve a

small amount of the original habitat and species on Site in comparison to the full removal of these KER habitats. The embedded design measure to scatter both native grassland and a 5m boarder around the infilled land to allow for re-growth of native woodland also replaces some of the lost functionalities from removal of bog woodland to the receptors on-site, particularly for small mammals, bird populations and bats. Finally, the open nature of the end state of the Site and full accessibility by even larger mammals offsets initial impact of habitat removal.

There will be a maximum of *Slight* residual impacts on any KER on Site as a result of the Proposed Development with the implementation of outlined mitigation measures and best practice standards.

Four enhancement measures are proposed to improve the biodiversity of the Proposed Development. These include the instalment of Bat boxes, a Pine Marten nesting box, a Red Squirrel nesting box and planting of Scots Pine following infill.

5.20 References

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6 LAND AND SOILS

6.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) provides a description of the land, soils and geology within and immediately surrounding the site of the Proposed Development and an assessment of the potential effects of the Proposed Development on the receiving land, soils and geology and sets out any required mitigation measures where appropriate.

The principal objectives of this chapter are to identify:

- Land, soils, and geological characteristics of the receiving environment at the site.
- Potential effects that the Proposed Development may have on land, soils and geology including “worst case” scenario assessment.
- Potential constraints that the environmental attributes may place on the Proposed Development.
- Required mitigation measures which may be necessary to minimise any adverse effects related to the Proposed Development.
- Evaluate the significance of any residual effects.

This chapter of the EIAR should be read in conjunction with Chapter 4 Population and Human Health, Chapter 5 Biodiversity, Chapter 7 Hydrology and Hydrogeology, Chapter 8 Air Quality, Chapter 11 Landscape and Visual Effect, Chapter 13 Material Assets: Traffic and Transport and Chapter 14 Material Assets: Waste and Utilities of the EIAR and other information provided by the Applicant pertaining to the design proposals for the Proposed Development.

6.1.1 Quality Assurance and Competency of Experts

This chapter was prepared by Nuria Manzananas BSc, MSc, PGeo, a Principal Consultant of DNV with 12 years’ experience in contaminated land and hydrogeological assessments.

The chapter was reviewed by Gareth Carroll BA BEng MEnvSc CEnv, a Principal Consultant of DNV. Gareth, a Chartered Environmentalist with the Institute of Environmental Sciences (CEnv) and over 13 years’ experience in environmental assessment of brownfield and greenfield sites for a range of project types and geological and hydrogeological site settings and is professionally competent and accredited to undertake environmental effect assessments.

The report was approved by Patrick Higgins BSc, MSc, MEnvSc, CEnv. Patrick is a Chartered Environmentalist (CEnv) with IES with over 20 years’ experience of preparing environmental and hydrogeological assessments for a range of project types and geological and hydrogeological site settings, and is a Technical Director with DNV, who is professionally competent and accredited to undertake hydrogeological assessments.

6.2 Study Methodology

6.2.1 Relevant Legislation and Guidance

The methodology adopted for the assessment will take cognisance of relevant guidelines, in particular the following:

- Environmental Protection Agency (EPA), 2022. Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022).
- Institute of Geologists of Ireland (IGI), 2002. Geology in Environmental Impact Statements – A Guide (IGI, 2002).
- Institute of Geologists of Ireland (IGI), 2013. *Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements* (IGI, 2013).
- National Roads Authority, 2009. Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA, 2009).
- Laois County Council (LCC), 2021. Laois County Development Plan 2021–2027.

6.2.2 Phased Approach

A phased approach was adopted for this EIAR in accordance with the Environmental Protection Agency (EPA) and Institute of Geologists of Ireland (IGI) guidelines as set out above and is described in the following sections.

Element 1: An assessment and effect determination stage was carried out by DNV to establish the project location, type and scale of the development, the baseline conditions, and the type of land, soils and geological environment, to establish the activities associated with the Proposed Development. This element of the assessment also included developing the Conceptual Site Model (CSM) for the site and receiving environment.

The study area, for the purposes of assessing the baseline conditions for the Land, Soils and Geology Chapter of the EIAR, extends beyond the site boundaries and includes potential receptors with which there may be a pathway to/from the Proposed Development and receptors that may be indirectly affected by the Proposed Development. The extent of the wider study area was based on the IGI, 2013 Guidelines, which recommend a minimum distance of 2km from the site.

The study area for the Land, Soils, and Geology Chapter of the EIAR is defined to ensure a comprehensive assessment of baseline conditions. This area, as stated above, extends beyond the immediate boundaries of the site of the Proposed Development to include a broader region. The site refers specifically to the land where the Proposed Development will take place. In contrast, the study area encompasses a wider region, extending at least 2km from the site, as recommended by the Institute of Geologists of Ireland (IGI) 2013 Guidelines. This broader area is necessary to identify and evaluate all potential receptors that could be affected by the Proposed Development, either directly or indirectly. The distinction between the application site and the study area is crucial. The site of the Proposed Development is the focal point of the Proposed Development, while the study area includes additional regions that might experience secondary effects. For instance, potential receptors within the study area include surrounding land that might undergo changes in land use or quality, soil quality and

composition that could be altered by construction activities, and underlying geological features that might be affected.

The justification for this wider study area lies in the need to capture all potential effects comprehensively. While the primary focus is on the application site, the broader study area ensures that any indirect or secondary effects on land, soil, and geology are also considered. This approach provides a detailed and accurate picture of how the Proposed Development might affect these aspects of the environment, helping stakeholders make informed decisions and ensuring that all potential environmental effects are thoroughly assessed.

The desk study involved collecting all the relevant data for the Proposed Development site and surrounding area, including published information and details pertaining to the Proposed Development provided by the Applicant and the design team. DNV completed two walkover surveys on 9th December 2025 and on 26th January 2026.

The Element 1 stage of the assessment was completed by DNV and included the review of the following sources of information:

- Environmental Protection Agency (EPA) webmapping 2026 (EPA, 2026).
- Geological Survey of Ireland (GSI) Datasets Public Viewer and Groundwater webmapping, 2026 (GSI, 2026).
- Google Earth Mapping and Imagery, 2026 (Google Earth, 2026).
- Ordnance Survey Ireland (OSI) webmapping, 2026 (OSI, 2026).
- National Parks and Wildlife Services (NPWS) webmapping, 2026 (NPWS, 2026).
- Teagasc webmapping, 2026 (Teagasc, 2026).
- Information provided by the Applicant pertaining to the design proposals for the Proposed Development.

Other documents and reports reviewed as part of this assessment included the following:

- DNV, 2026a. Hydrogeological Risk Assessment (submitted with the planning application under separate cover).
- DNV, 2026b. Resource and Waste Management Plan (submitted with the planning application under separate cover).

Element 2: Involves direct and indirect site investigation and studies stage where necessary to refine the CSM developed as part of Element 1 and evaluate the potential effects associated with the Proposed Development. Based on a review of the information compiled and assessed as part of Element 1, including the findings of walkover surveys, it was determined that no direct or indirect site investigations or additional studies were required. Sufficient baseline information was available for the Proposed Development Site to inform a robust assessment of the potential impacts of the Proposed Development on the receiving land, soil, and geological environment. **Element 3:** Evaluation of Mitigation Measures, Residual Effects and Final Effect Assessment was based on the outcome of the information gathered in Element 1 and Element 2 of the assessment. Mitigation measures to address all identified adverse effects that were identified in Element 1 and Element 2 of the assessment were considered in relation to the Construction Phase and Operational Phase of the Proposed Development. These mitigation measures were then considered in the effect assessment to identify any residual effects.

Element 4: Completion of the Land, Soil and Geology sections of the EIAR in this Chapter which includes all the associated figures and documents.

6.2.3 Description of Importance of the Receiving Environment

The Transport Infrastructure Ireland (TII) criteria for rating the importance of geological features at the site, as documented in the National Roads Authority Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA, 2009), are summarised in Table 6-1.

Table 6-1. Criteria for Rating Site Importance of Geological Features

Importance	Criteria	Typical Example
Very High	Attribute has a high quality, significance, or value on a regional or national scale. Degree or extent of soil contamination is significant on a national or regional scale. Volume of peat and/or soft organic soil underlying route is significant on a national or regional scale.	Geological feature rare on a regional or national scale (NHA). Large existing quarry or pit. Proven economically extractable mineral resource.
High	Attribute has a high quality, significance, or value on a local scale. Degree or extent of soil contamination is significant on a local scale. Volume of peat and/or soft organic soil underlying route is significant on a local scale.	Contaminated soil on-site with previous heavy industrial usage. Large recent landfill site for mixed wastes. Geological feature of high value on a local scale (County Geological Site). Well drained and/or high fertility soils. Moderately sized existing quarry or pit. Marginally economic extractable mineral resource.
Medium	Attribute has a medium quality, significance, or value on a local scale. Degree or extent of soil contamination is moderate on a local scale. Volume of peat and/or soft organic soil underlying route is moderate on a local scale.	Contaminated soil on-site with previous light industrial usage. Small recent landfill site for mixed wastes. Moderately drained and/or moderate fertility soils. Small existing quarry or pit. Sub-economic extractable mineral resource.
Low	Attribute has a low quality, significance, or value on a local scale. Degree or extent of soil contamination is minor on a local scale. Volume of peat and/or soft organic soil underlying route is small on a local scale.	Large historical and/or recent site for construction and demolition wastes. Small historical and/or recent landfill site for construction and demolition wastes. Poorly drained and/or low fertility soils. Uneconomically extractable mineral resource.

6.2.4 Description and Assessment of Potential Effect

Effects will vary in quality from negative to neutral or positive. The effects of effects will vary in significance on the receiving environment. Effects will also vary in duration. The terminology and methodology used for assessing the 'effect' significance and the corresponding 'effect' throughout this chapter are described in Table 6-2 in accordance with EPA, 2022 guidelines on the information to be contained in EIARs.

Table 6-2. Assessment of Potential Terminology and Methodology

Quality of Effects/Effects	Definition
Negative	A change which reduces the quality of the environment
Neutral	No effects or effects that are imperceptible, within the normal bounds of variation or within the margin of forecasting error.
Positive	A change that improves the quality of the environment
Significance of Effects / Effects	Definition
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant Effects	An effect which, by its character, magnitude, duration, or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration, or intensity significantly alters a sensitive aspect of the environment.
Profound Effects	An effect which obliterates sensitive characteristics.
Extend and Context of Effects	Definition
Extend	Describe the size of the area, the number of sites and the proportion of a population affected by an effect.
Context	Describe whether the extent, duration or frequency will conform or contrast with established (baseline) conditions
Probability of Effects	Definition
Likely Effects	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
Unlikely	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Duration of Effects / Effects	Definition
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting one year or less
Short-term	Effects lasting one to seven years
Medium-term	Effects lasting seven to fifteen years
Long-term	Effects lasting fifteen to sixty years
Permanent	Effects lasting over sixty years
Reversible	Effects that can be undone, for example through remediation or restoration
Types of Effects	Definition
Indirect Effects	Effects on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway

Cumulative Effects	he addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects.
“Do-nothing” Effects	The environment as it would be in the future should the subject project not be carried out
“Worst-case” Effects	he effects arising from a project in the case where mitigation measures substantially fail.
Indeterminable Effects	When the full consequences of a change in the environment cannot be described.
Irreversible Effects	When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost
Residual Effects	The degree of environmental change that will occur after the proposed mitigation measures have taken effect.

Figure 6-1 identifies how comparing the character of the predicted effect to the sensitivity of the receiving environment can determine the significance of the effect.

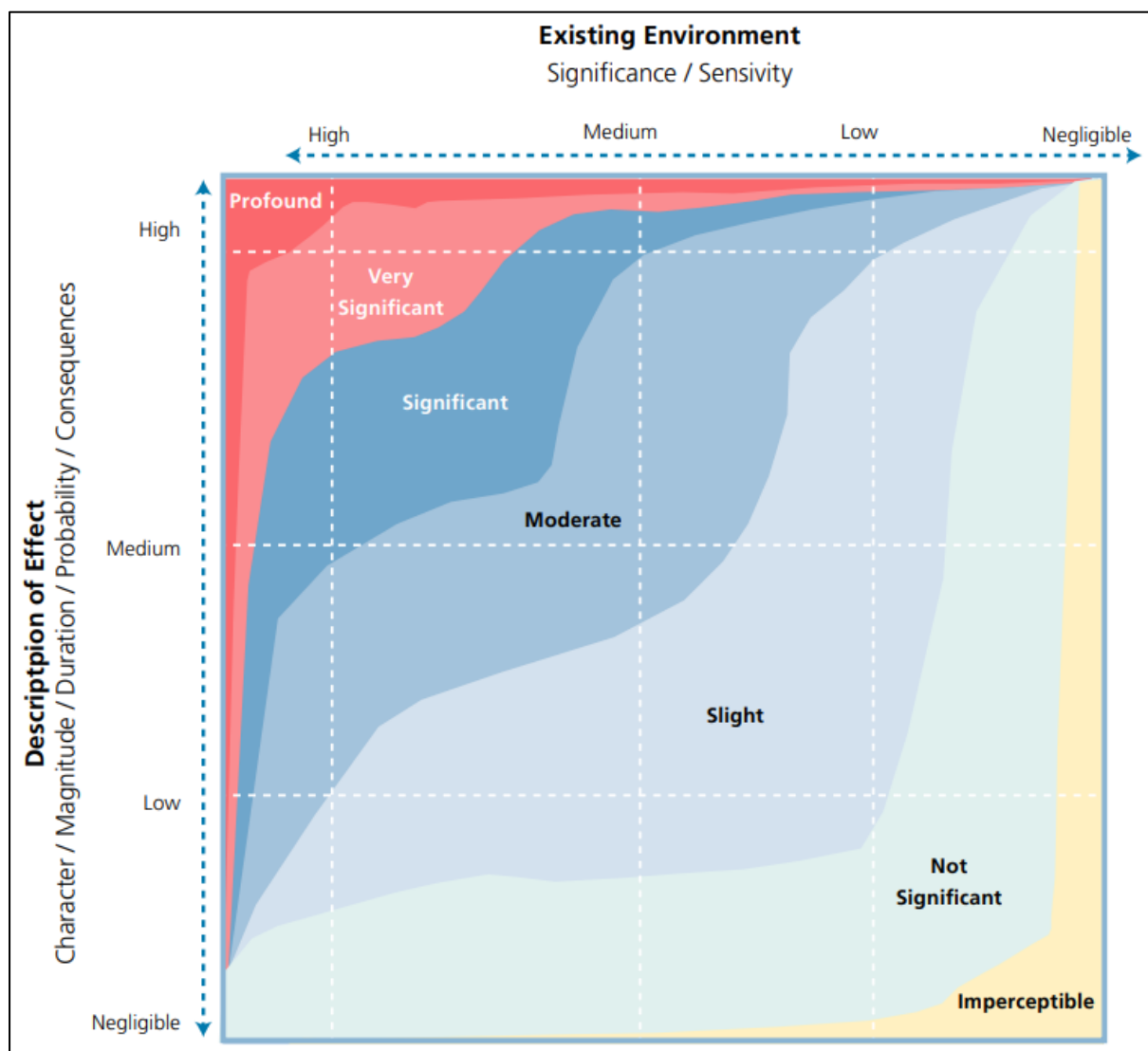


Figure 6-1. Determining Significance

6.3 The Existing and Receiving Environment (Baseline Situation)

6.3.1 Site Location and Surrounding Land Use

The site is approximately 2.57km north of Portlaoise town centre and is located between Portlaoise to the southeast and Mountmellick to the northwest. Access to the site is provided via the L2117 local primary road located to the southeast of the site, through an established private access that also serves adjoining third-party lands to the north. The L2117 joins with the national secondary route, the N80, at a controlled junction located approximately 900m southwest of the site.

The lands immediately adjoining the site to the north and west consist of a combination of uncultivated land and areas of existing industrial activity. Lands directly to the west of the site comprise agricultural lands associated with established dairy and beef farming enterprises.

The former Portlaoise Landfill facility is located approximately 750 metres southwest of the site, which now functions as a recycling centre (Portlaoise Waste and Recycling facility). A number of industrial and waste-related facilities are located approximately 400 metres west of the Proposed Development, each operating under existing waste licences.

The site location is presented in Figure 6-2.

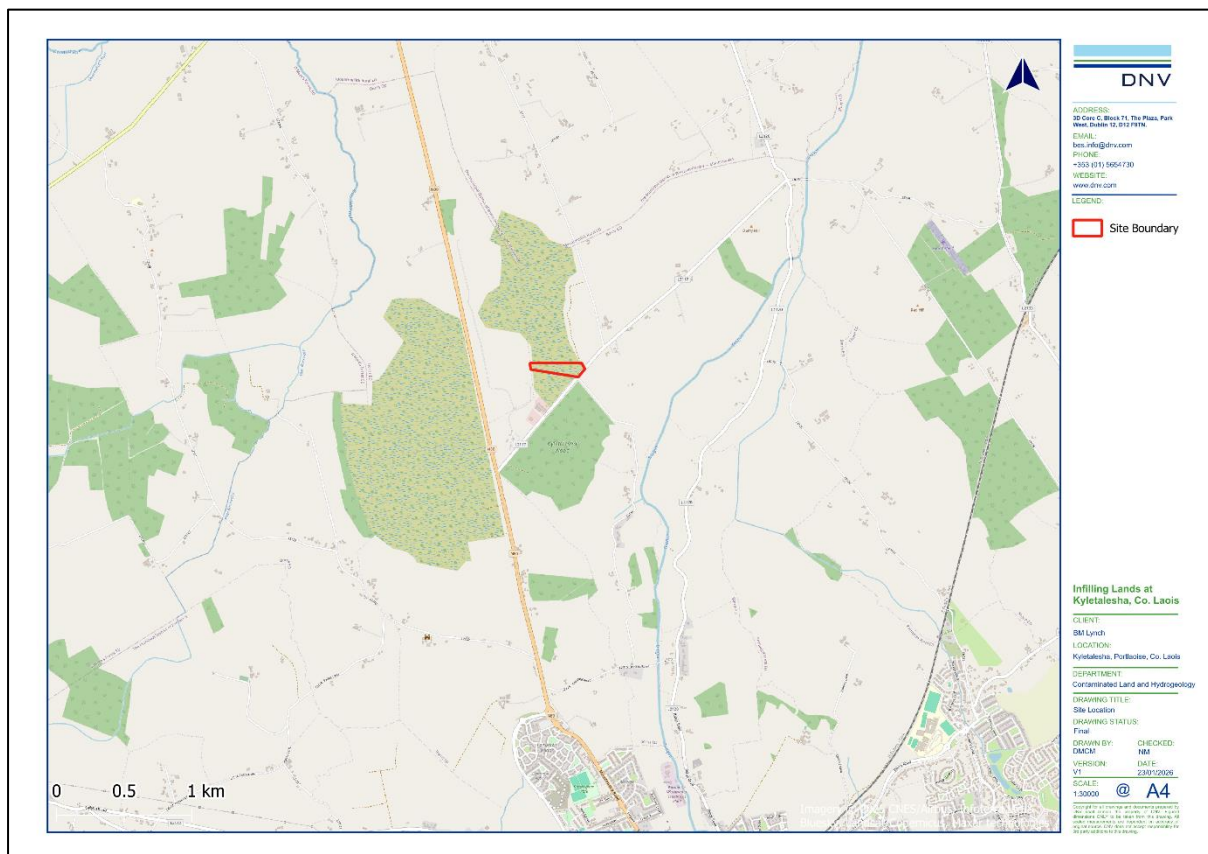


Figure 6-2. Site Location

6.3.2 Current and Historical Land Use

The site of the Proposed Development is located within the eastern edge of the Clonreher Bog. Although the precise historical land-use is not documented, it is considered likely that limited, non-commercial peat extraction took place on the lands at site in the past. Following

the cessation of the limited peat-related activity, the lands regenerated naturally and have remained unused for productive agricultural purposes due to wet ground conditions. As a result, the site has become overgrown with ground-cover vegetation and self-seeding trees (refer to Figure 6-3).

The site is designated as an “Area under Strong Urban Influence” in the rural housing policy of the Laois County Development Plan 2021–2027 and lies approximately 2.5km from existing and proposed residential zoned lands within the Plan.

The ground at the site is wet underfoot and is characterised by an overgrowth of self-seeded trees and ground vegetation that has established over-time following the cessation of peat-related activity. The existing ground conditions render the lands unsuitable for agricultural use and pose risks to both farm machinery and livestock.

Ground levels are below the local primary road level and decline gradually in a westerly direction.

The lands immediately adjoining the site to the north and west consist of a combination of uncultivated land and areas of existing industrial activity. Lands directly to the west of the site comprise agricultural lands associated with established dairy and beef farming enterprises.

Surrounding lands comprise a mix of agricultural holdings, uncultivated areas, and established industrial and waste-related operations, reflecting a long-standing pattern of mixed rural and industrial land use in this locality.

The wider area has an extensive history of waste-related activity, including the former Portlaoise Landfill and a number of licensed waste and industrial facilities located within proximity to the site. However, there is no record of previous extraction, development, or landfilling activity on the Proposed Development site itself, which forms part of the historical cutover bog footprint of Clonreher Bog.

The planning history relevant to the site is summarised in Chapter 3 of this EIAR.



Figure 6-3. Current Site Layout

6.3.3 Soils

The soils beneath the majority of the site are mapped by Teagasc (Teagasc, 2026) as poorly drained cutover peat (IFS Soil Code: Cut). A small area of the eastern portion of the site is mapped as poorly drained mineral (mainly basic) soil (IFS Soil Code: BminPD).

The soils beneath the site are presented in Figure 6-4.



Figure 6-4. Teagasc Soils

6.3.4 Quaternary Sediments

The quaternary sediments or subsoils beneath the majority of the site are mapped by the GSI (GSI, 2026) as cutover raised peat. A small area of the eastern portion of the site is mapped by the GSI (GSI, 2026) as till derived from Lower Carboniferous limestone (TLs).

The quaternary sediments beneath the site are presented in Figure 6-5.

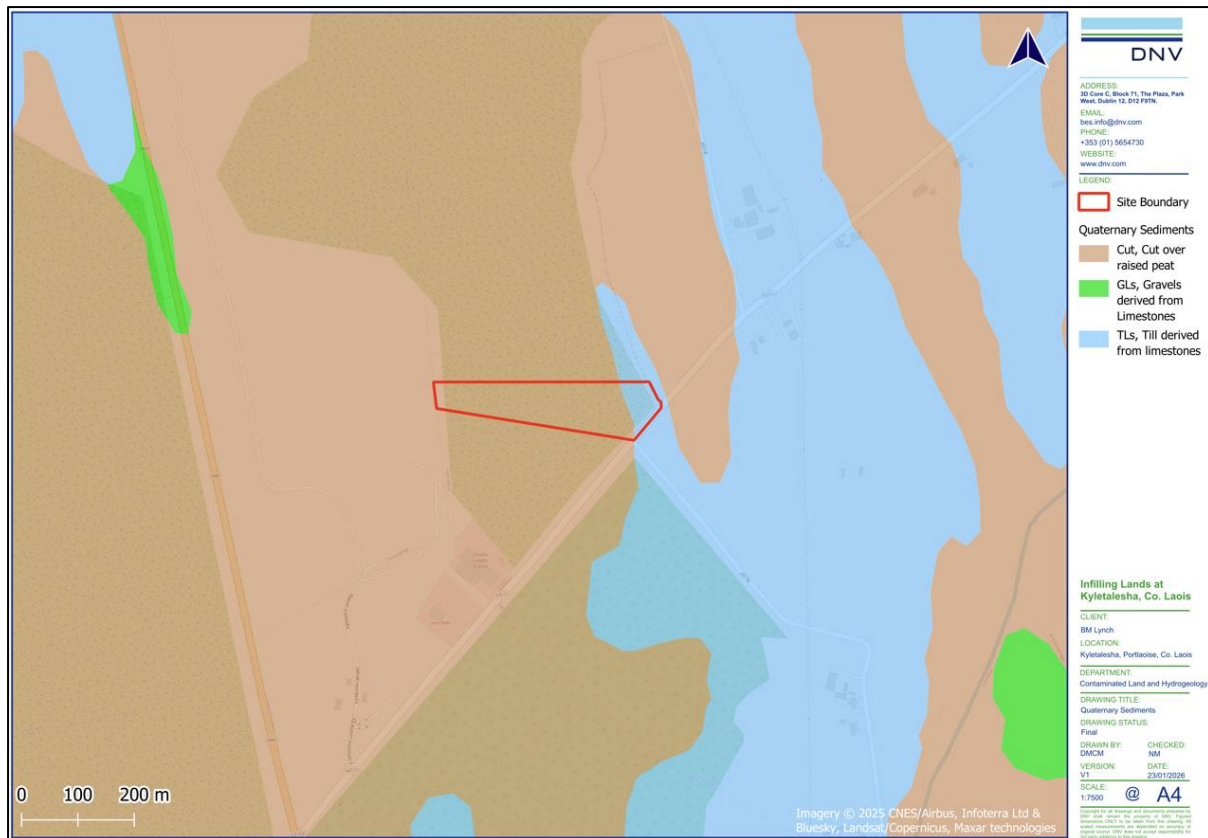


Figure 6-5. Quaternary Soils

6.3.5 Quaternary Geomorphology

The GSI (GSI, 2026) has identified four (11No.) Hummocky Sand and Gravel landforms in the close vicinity of the site, as follows:

- (IE_GSI_GL_deglacial_50K_1955) located approximately 0.45km west of the site.
- (IE_GSI_GL_deglacial_50K_2643) located approximately 0.7km southeast of the site.
- (IE_GSI_GL_deglacial_50K_1485) located approximately 1.1km southeast of the site.
- (IE_GSI_GL_deglacial_50K_669) located approximately 1.12 km northeast of the site.
- (IE_GSI_GL_deglacial_50K_8503) located approximately 1.37km southeast of the site.
- (IE_GSI_GL_deglacial_50K_5475) located approximately 1.47km east of the site.
- (IE_GSI_GL_deglacial_50K_3284) located approximately 1.5km northeast of the site.
- (IE_GSI_GL_deglacial_50K_1173) located approximately 1.55km southeast of the site.
- (IE_GSI_GL_deglacial_50K_5687) located approximately 1.87km northeast of the site.
- (IE_GSI_GL_deglacial_50K_4180) located approximately 1.87km northeast of the site.
- (IE_GSI_GL_deglacial_50K_4397) located approximately 1.9 km east/northeast of the site.

6.3.6 Bedrock Geology

The bedrock beneath the site is mapped by the GSI (GSI, 2026) as the Ballysteen Formation (Code: CDBALL) described as dark muddy limestone and shale.

There are no bedrock outcroppings at the site or within a 2km radius of the site (GSI, 2026).

The bedrock geology beneath the site is presented in Figure 6-6.

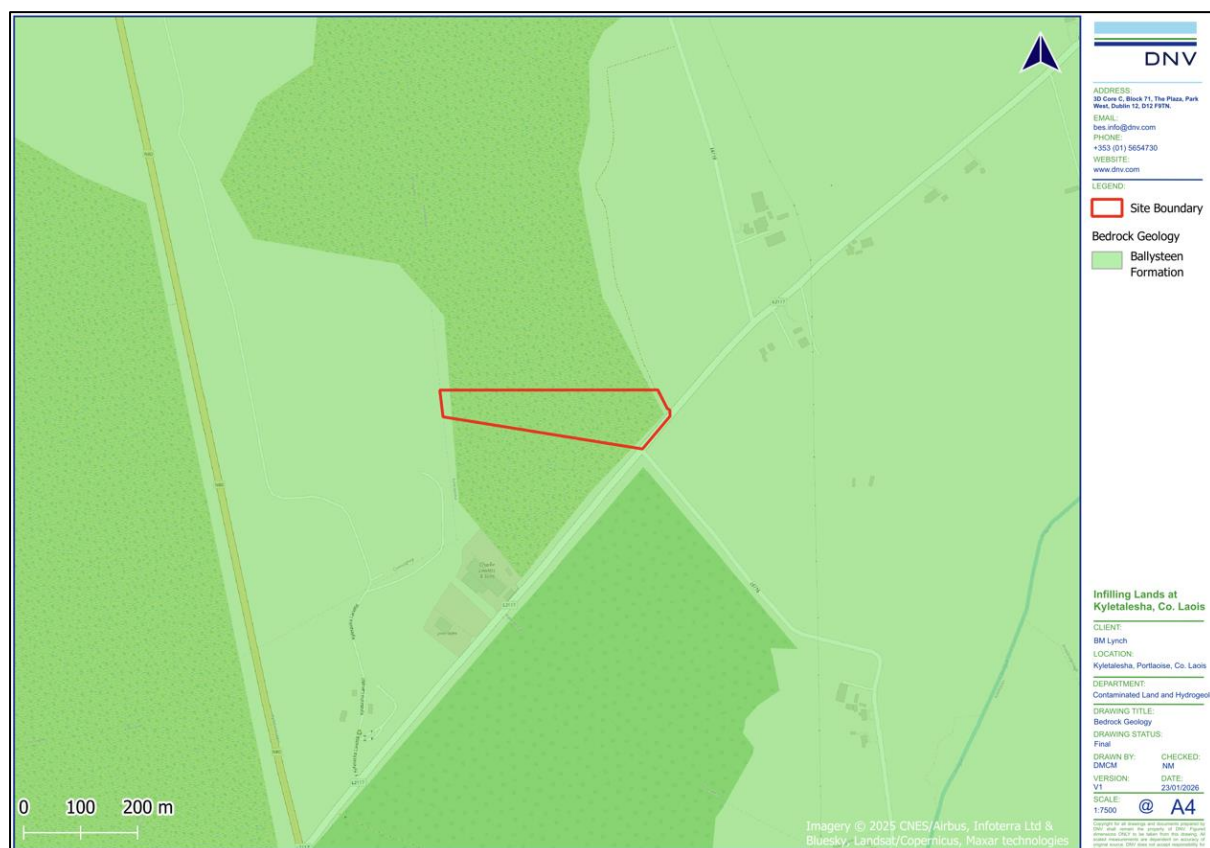


Figure 6-6. Bedrock Geology

6.3.7 Geochemical Domain

The GSI along with the EPA have developed geochemically appropriate levels (GALs) for soil recovery facilities across Ireland, specifically in relation to metals and metalloids in uncontaminated soil and stone (GSI, 2026). There are a total of seven defined domains across the country. The geochemical domains map indicates that the site is located within Domain 2, the subsoil composition is described as Carboniferous limestones, shales and related rocks. A summary of the maximum expected metal concentrations for Domain 2 is presented below in Table 6-3.

Table 6-3 Geochemically Appropriate Levels for Domain 2

Element	Units	Value
Arsenic	mg/kg	24.9
Cadmium	mg/kg	3.28
Chromium	mg/kg	50.30
Copper	mg/kg	63.50

Element	Units	Value
Mercury	mg/kg	0.36
Nickel	mg/kg	61.90
Lead	mg/kg	86.10
Zinc	mg/kg	197.00

6.3.8 Radon

The Radon Risk Map of Ireland (EPA, 2026) shows a prediction of the number of houses in any one area that are likely to have high radon levels. The map is based on an analysis of indoor radon measurements plus geological information, including bedrock type, quaternary geology, soil permeability and aquifer type.

The site is mapped by the EPA (EPA, 2026) as being in an area where 'about 1 in 10 homes in this area is likely to have high radon levels'.

The EPA cite the reference level for radon as 200 Bq/m³ and a High Radon Area where more than 10% of homes may have more than the reference level of radioactivity. Therefore, the site is not located within a High Radon Area. It is noted that a high radon level can be found in any home, in any part of the country, but these homes are more likely to be located in medium to high radon areas.

6.3.9 Geohazards

There are no karst features mapped by the GSI (GSI, 2026) at the site or within a 2km radius of the site. The closest karst feature is a borehole (KARST40KID: IE_GSI_KARST_40K_2459) located 2.7km east of the site boundary.

The site of the Proposed Development is located within an area with a 'low' landslide susceptibility (GSI, 2026). There are no recorded landslides at the site (GSI, 2026).

In Ireland, seismic activity is recorded by the Irish National Seismic Network operated by the Dublin Institute for Advanced Studies (DIAS), which has been recording seismic events in Ireland since 1978. There are six (6No.) permanent broadband seismic recording stations in Ireland operated by DIAS. Records since 2010 show that the majority of recorded seismic events were associated with quarry blasts and no recent events have been recorded within 2km of the site.

6.3.10 Geological Heritage Sites

There are no geological heritage sites mapped by the GSI (GSI, 2026) within the site. The closest geological heritage site, the Ridge of Portlaoise (Site Code: LS029), is located approximately 1.0km east of the site boundary and described as '*A long, sinuous accumulation of sands and gravels deposited under the ice sheet and at its margin*'.

The geological heritage sites in the vicinity of the site are presented in Figure 6-7.

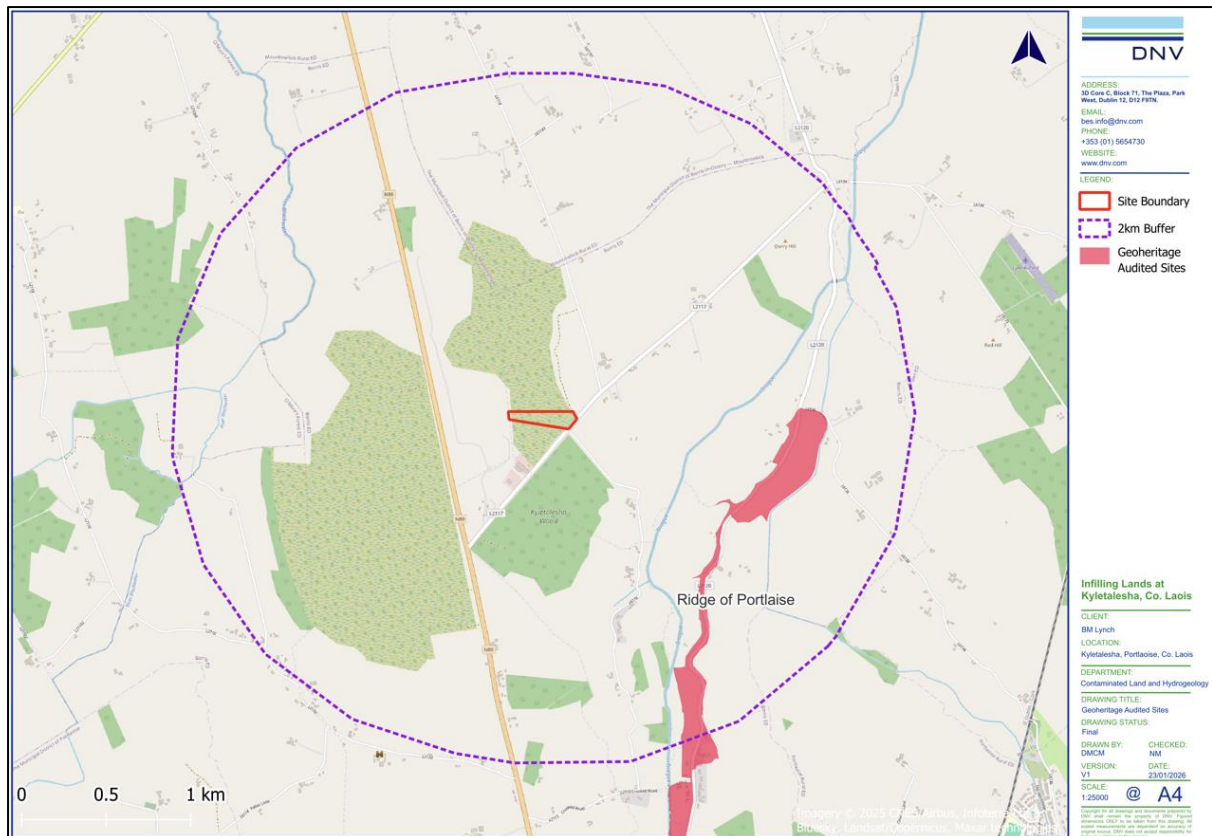


Figure 6-7. Geological Heritage Sites

6.3.11 Economic Geology

The lands beneath the majority of the site are mapped by the GSI (GSI, 2026) as having no mapped granular aggregate potential. However, the granular aggregate potential at the northeast boundary of the site is classified as having 'very high' potential.

The bedrock beneath the majority of the site has been identified by the GSI (GSI, 2026) as having a 'very low' potential for crushed rock aggregate and a small portion of the northeastern area of the site as having 'low potential'.

The mapped granular aggregate potential and rock aggregate potential for the site is presented in Figure 6-8 and Figure 6-9.

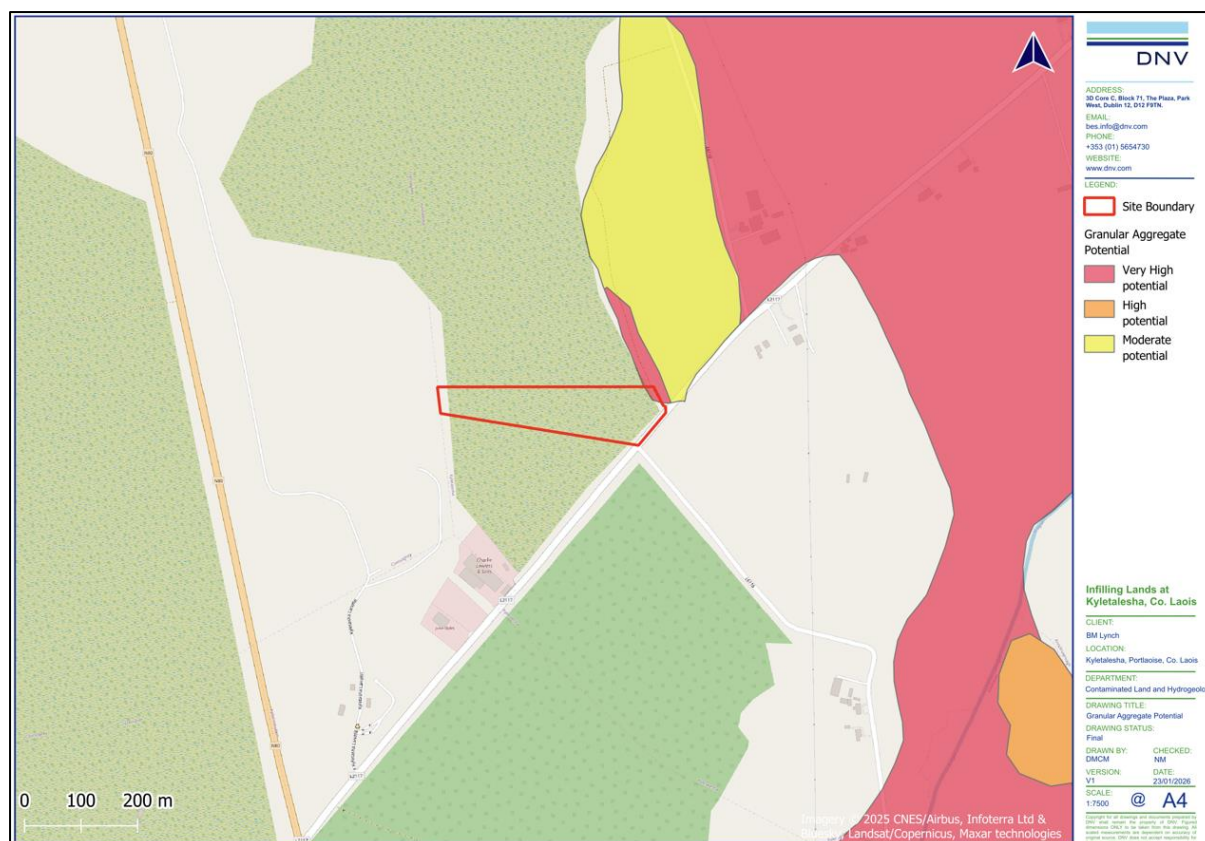


Figure 6-8. Granular Aggregate Potential

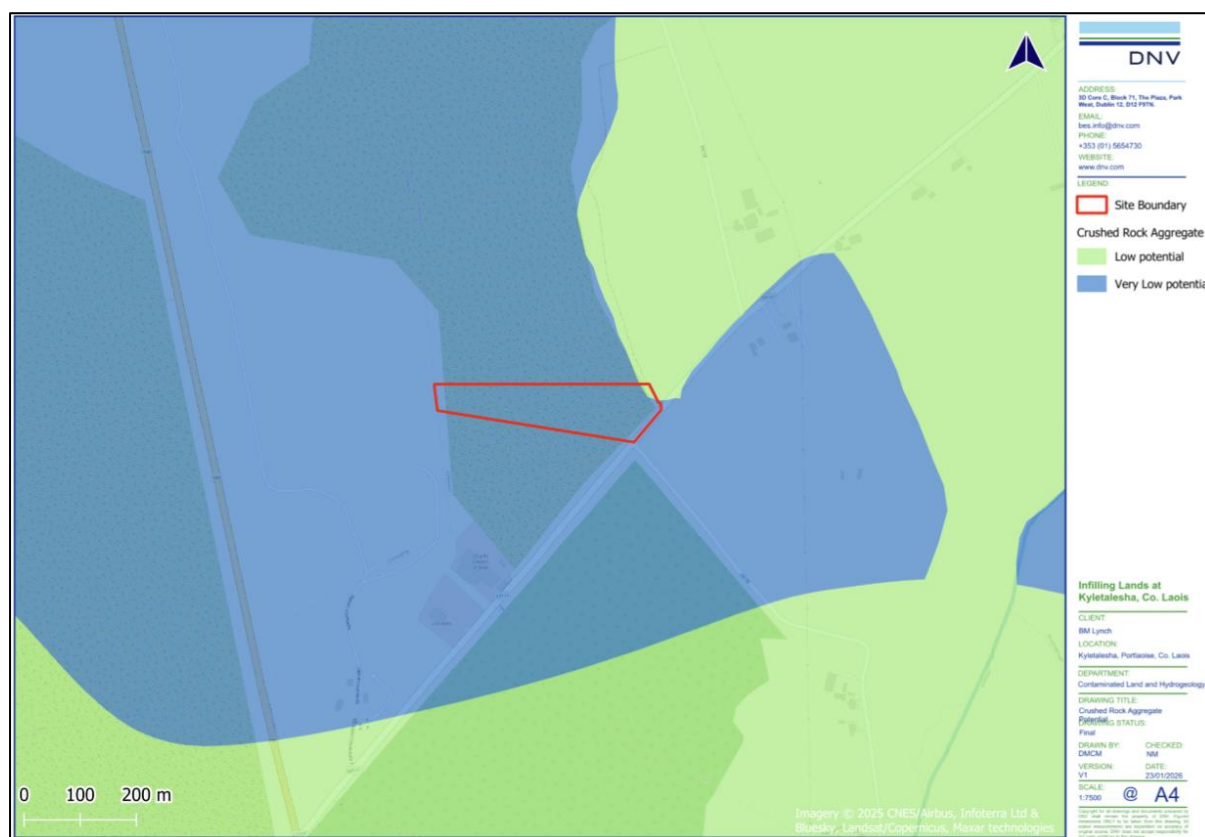


Figure 6-9. Rock Granular Potential

6.3.12 Importance of Baseline Environment

The lands forming the Proposed Development site consist of a cutover bog. According to the GSI (GSI, 2026), the subsoils are mapped as having no granular aggregate potential, except for a small portion below the northeastern boundary of the site, which is classified as having a very high granular potential. The underlying bedrock is classified as having a very low to low potential, indicating that the economic extraction of granular and crushed rock aggregates from this site is not feasible.

There are no geological heritage sites within the site. The closest geological heritage site is located 1km east of the site boundary (i.e., the Ridge of Portlaoise (Site Code: LS029)).

Taking into account the attributes of the soil and geology underlying the site, and in accordance with the TII Guidance as documented by the NRA (NRA, 2009) and as outlined in Table 6-1, the soil and bedrock underlying the site of the Proposed Development would be rated as having an overall 'low' geological importance.

6.4 Characteristics of the Proposed Development

This application is to apply for permission for the importation of excavated inert soil and stone and recontouring development on 2.92 hectares (ha), of which 2.52ha is developable for infilling, elongated site comprising low-lying land on the eastern boundary of the former Clonreher bog, partially wooded bogland in a rural location at Kyletalesha.

As documented in the Outline Construction Environmental Management Plan (OCEMP) (Lenztech, 2023), carried out by Lenztech Surveying & Engineering Ltd. on behalf of BM Lynch Construction & Civils, the development is designed to facilitate the recovery of excavated inert soil and stone (by-product) from local greenfield residential development sites and proposes the infilling with an estimated maximum volume of 50,250m³ (85,000 tonnes).

The lands will be recontoured to a maximum height of 2.6m with an average depth of 1.9m, with final recontoured lands remaining below the adjoining local primary road (L2117) level. The infilling of soil and regrading of land will support future agricultural activity, potential forestry, amenity use, or other appropriate land uses within these low-lying lands, which represents the intended end use of the Proposed Development.

The development works will allow for the use of materials as resources, thereby minimising the requirement for the extraction of additional natural resources. Surplus excavated material to be used for infilling will be materials designated as a By-product as defined within Article 27 of the European Communities (Waste Directive) Regulations 2011 typically greenfield soil and stone.

A full description of the Proposed Development is outlined in Chapter 2 of this EIAR.

6.4.1 Construction Phase

The construction phase of the Proposed Development will comprise the following enabling works:

- Site clearance of the entire area.
- Widening of the road.
- Establishment of the construction compound.

The construction phase of the Proposed Development will require the clearance of the majority of self-seeded trees and vegetation across the site, together with a series of enabling works to prepare the area for the subsequent infilling and regrading operations. The roadside boundary hedge on the northern and eastern sides of the site will require partial removal as necessary to facilitate sightlines and access. These preparatory works will include the installation of temporary site fencing, the establishment of buffer strips to adjoining lands, the protection of existing site drainage infrastructure, the construction of a Temporary Construction Compound (TCC), and the formation of the site access, including road widening works.

The location of all drainage features will be identified and surveyed prior to commencement for record and maintenance purposes, and all existing drainage ditches and bog drains will be retained.

The TCC will be formed by stripping and regrading the topsoil, followed by the installation of a geotextile membrane and a layer of imported stone. The stripped topsoil will be stored adjacent to the compound within a linear bund typically no greater than 2 m in height. Superficial soil will be stripped and stored separately from the topsoil and will be stored in a similar manner.

As part of the preparatory works for the site, there will be temporary silt containment barriers put in place in all the identified bog drains graded of material. In addition, the existing drainage features (i.e., chartered bog/field drains) will be cleared of vegetation and filled with clean washed CL6A material to TII specification. They will be maintained and upgraded to filter drains to maintain existing drainage flows.

It is expected that the use of cementitious material will be required for foundations to palisade fence post, benching of manhole bases, etc. It is envisaged that approximately 16m³ will be utilised and mixed at the batching plant.

Refer to Chapter 2 – Description of the Proposed Development of this EIAR.

6.4.2 Operational Phase

The operational phase of the Proposed Development will involve the importation of approximately 50,250m³ (85,000tonnes) of inert soil and stone to the site to restore 2.92ha of the total site (with approximately 2.52ha available for development), as mentioned above, which will be sourced from local development sites and their subsequent spreading and infilling. The material to be imported meets the criteria for classification as a by-product under Regulation 27 of the European Communities (Waste Directive) Regulations 2011. In addition, a total of 87m³ (150 tonnes) of material from the construction phase will be also reused onsite.

The lands will be recontoured to a maximum height of 2.6metres (m) with an average depth of 1.9m. The engineering infilling works and recontouring of the site will be completed within the lifetime of any grant of permission and returned for agricultural, forestry planting or amenity use within the 5-year period.

The operations will progress on a phased basis. The phasing plan is shown in Figure 6-10 and will comprise four (4 No.) different phases, as follows:

- Phase 1 (Phase 1a and Phase 1b): It will comprise the regrading works of the third part of the site, the most eastern part of the site.

- Approximately 25,550m³ (or 33,215 tonnes using a conversion factor of 1.3 tonnes per m³) will be infilled at the site during this phase of works.
 - Soil and stone material will be regraded in 200mm-250mm thickness layers.
 - The material will be temporarily stockpiled for re-grading beside the temporary permeable granular unloading area (i.e., temporary haul route).
 - The material placed into the drainage features during the infilling of the site to achieve the new formation levels will be deposited without compaction.
 - The water will be allowed to flow through the existing drainage features at right angles in either direction.
 - Runoff from the areas of exposed soil will be intercepted by a silt containment barrier installed in advance of the drainage ditch during the preparatory works (i.e., construction phase).
- Phase 2: It will comprise the regrading works of the third part of the site, the middle part of the site. Approximately 22,250m³ (or 28,925 tonnes using a conversion factor of 1.3 tonnes per m³).
 - The most eastern part of the site that was infilled in Phase 1, will be regraded and recontoured during Phase 2.
 - Infilling of the middle part of the site will take place subsequently to the regrading works within the most eastern part of the site.
- Phase 3: It will comprise the regrading works of the third part of the site, the most western part of the site. Approximately 18,200m³ (or 23,660 tonnes using a conversion factor of 1.3 tonnes per m³).
 - The area infilled during Phase 2 (i.e., the middle part of the site) will be regraded and recontoured during Phase 3.
 - Infilling of the most western part of the site will take place subsequently to the regrading works within the middle part of the site.
 - The temporary haul route is being extended along each phase for the regrading works.
- Phase 4: It will comprise the completion stage.
 - The area infilled during Phase 3 (i.e., western part of the site) will be regraded and recontoured during Phase 4.
 - The temporary haul route and TCC and associated works, utilised during the regrading works, including any granular material (i.e., imported material), will be removed on completion (i.e., during Phase 4).
 - Concrete manholes, manhole lids, access covers, etc., will be recovered for storing and recycled use.
 - Sub-surface pipework for SuDS drains will remain in place.
 - Swales will be infilled as the compound is decommissioned and the demobilisation of TCC and associated works occurs.
 - Granular material utilised in the construction of the compound (TCC) will be removed to be stored and recycled for haul routes on any other projects.
 - There will be some minor waste from manhole bases, etc., which will be placed in skips for removal offsite and disposal to a licenced facility.
 - The surface will then be reseeded as required. Where ground conditions allow, inert materials such as the imported stone may be retained in place, with reinstatement achieved through the replacement of stored soils. In these circumstances, the area would be kept on record and could be reused as the TCC during any future decommissioning phase.

The recontoured lands will remain below the adjoining local primary road (L2117) and the reuse of the soil and stone will benefit any future agricultural activity, potential forestry, amenity or other use of the site within the identified low-lying agricultural lands in the future.

The infilling phases for the Proposed Development are presented in Drawing No. 22024-010 (Lenztech Surveying and Engineering Limited).

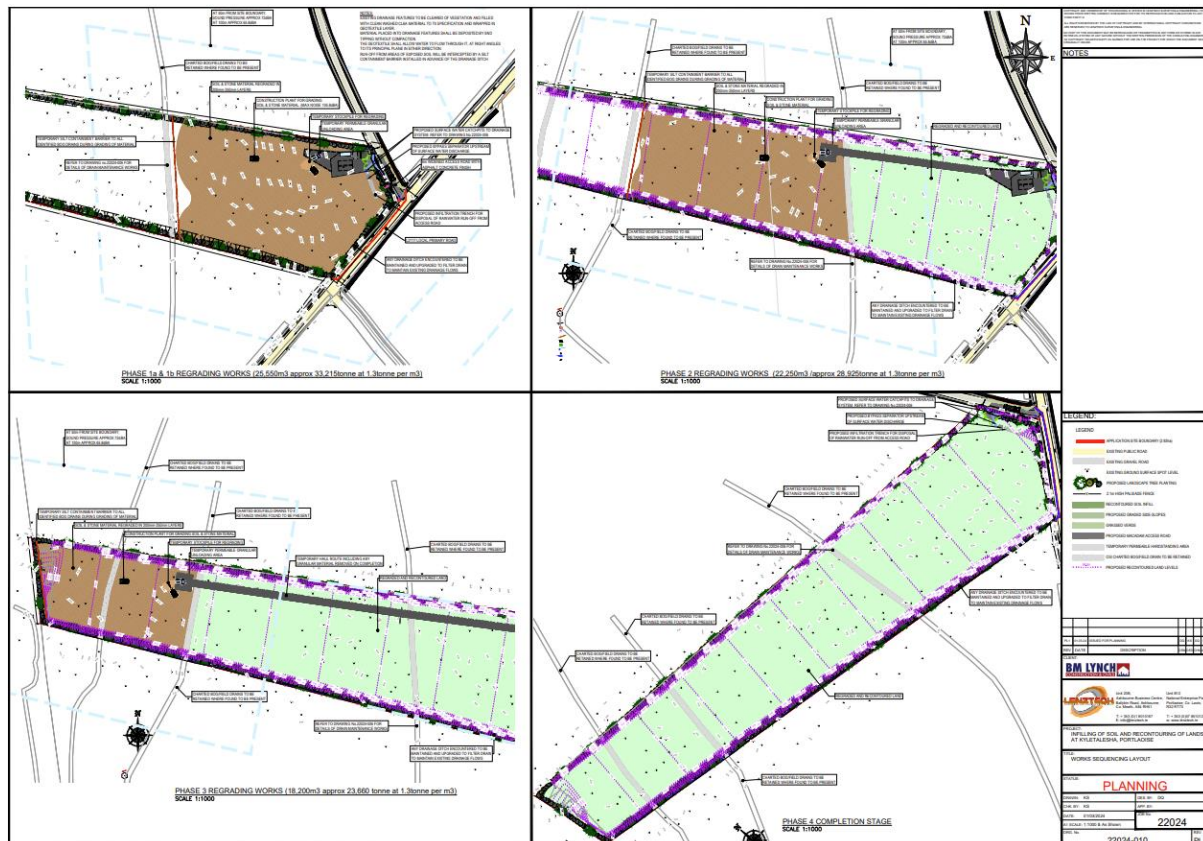


Figure 6-10. Proposed Works Sequencing (Infilling Phases)

6.5 Potential Impact of the Proposed Development

The procedure for the determination of potential effects on the receiving land, soils and geology is to identify potential receptors within the Proposed Development site boundary and surrounding environment and use the information gathered during the desk study and site walkover to assess the degree to which these receptors will be effected upon in the absence of mitigation.

The assessment will identify the likely effects during the construction and operational phases of the Proposed Development. This will involve assessing the significance of any potential effects by determining the sensitivity of the receptors and the magnitude of the potential effect. Effects are described in terms of quality, significance, duration and type as detailed in Table 6-2.

6.5.1 Construction Phase

This phase of the Proposed Development will consist of site preparation activities required to enable the operational phase of the Proposed Development. No significant excavation works

or excavated material is anticipated to arise onsite as part of the planned works. Soils in areas taken for temporary use will ideally be stockpiled close to the excavation location.

6.5.1.1 Land Take and Land Use

The construction phase of the Proposed Development will include the establishment of a TCC, which will require approximately 11.5m² in size and will change part of the site from primarily bog area (i.e., cutover bog) to a construction site for the establishment of the TCC and associated works.

As a result, the development will involve an unavoidable land take, leading to a 'neutral', 'slight', and 'temporary' effect on land and soil, particularly when assessed in the context of optimisation of the land use. This is considered non-significant in the context of the EIA Directive.

6.5.1.2 Excavation and Removal of Soil and Subsoil

The establishment of the TCC (11.5m² in size) will not require the excavation of bedrock as the TCC will be formed by stripping and regrading the topsoil, followed by the installation of a geotextile membrane and a layer of imported stone across the compound footprint. The stripped topsoil will be stored adjacent to the compound within a linear bund typically no greater than 2m in height. Superficial soil (i.e., subsoils), if needed, will be stripped and stored separately from the topsoil in a similar manner.

Although the excavated soil will remain onsite and will be available for reinstatement, if needed, the excavation or stripping and stockpiling will temporarily remove natural soil functions such as filtration and water retention within the affected area. As a result, the development will have a potential effect on soil and subsoil, leading to a 'neutral', 'not significant', and 'temporary' effect and is considered non-significant in the context of the EIA Directive.

6.5.1.3 Soil Quality and Contamination

Reuse of Soil and Subsoil

The construction phase of the Proposed Development will comprise the vegetation clearance from the site, which will be disposed of at an appropriate landfill or composting facility in accordance with relevant regulations. In addition, the excavation and reuse of soil onsite will be subject to control procedures, which will include soil quality testing to ensure suitability for onsite use in accordance with the specification for the Proposed Development that will be determined during the detailed design phase. Therefore, the reuse of soils onsite will result in a 'neutral', 'imperceptible' and 'permanent' effect on the quality of shallow soils underlying the site and is considered non-significant in the context of the EIA Directive.

Handling of Fuels and Hazardous Materials

The potential for accidental release of deleterious materials, including fuels and other materials being used onsite, through the failure of secondary containment or a materials' handling accident, may occur during the operational phase of the Proposed Development. Peat is a highly permeable material that can be easily contaminated and slow to recover, given an accidental spill or leak, which could potentially result in a 'negative', 'moderate to significant', 'long-term' effect on the receiving soil and geology, depending on the nature of the incident, which is considered significant in the context of the EIA Directive due to the

potential for long-term degradation of the effected soils in the absence of mitigation. This worst-case scenario is deemed to be unlikely to occur.

6.5.1.4 Soil Structure

The limited excavation of materials required for the establishment of the TCC and associated works (i.e., site clearance and road widening) during the construction phase of the Proposed Development will result in the exposure of the soils and subsoils to various elements, including weather, construction traffic and temporary stockpiling. This exposure can lead to changes in the soil's moisture content, temperature, and structure (e.g., rain can cause the soil to become waterlogged, dry weather can lead to desiccation and cracking, movement of construction vehicles and equipment over the soil can cause compaction and disturbance), reducing the soil's porosity, making it less able to absorb water and nutrients. Additionally, exposure and compaction of the soils is expected to be localised to access routes, the widened road area and the TCC footprint. The combined effects will have a potential 'negative', 'not significant' and 'short-term' effect on the performance of the soil structure and are considered significant in the context of the EIA Directive.

6.5.1.5 Importation of Aggregate Materials

The construction phase of the Proposed Development will involve the importation of limited aggregate fill materials for the construction of the TCC and associated works (i.e., granular material beneath the TCC, road widening and infilling of the drainage ditches). The potential effects may include loss of attributes and changes in the geological regime at the source site. It is anticipated that the required aggregates identified for importation onsite will have a 'neutral', 'imperceptible' and 'long-term' effect on the source site. This effect is considered imperceptible and non-significant in the context of the EIA Directive, taking into account the fact that the statutory consent process would have required the necessary environmental effects to be assessed and mitigated as appropriate at the source site.

Additionally, the limited works (i.e., site clearance and importation of stone) at the site will disturb the shallow soil or peat surface and introduce a new layer of imported material, which will influence the geotechnical behaviour (i.e., physical change). However, due to the inert nature of the material, chemical impacts are not expected. This will lead to a 'neutral' change, 'imperceptible' and 'short-term' effect on land and soil and is considered 'non-significant' in the context of the EIA Directive.

6.5.1.6 Dust Generation

There is a potential for the creation of windblown dust generation from the temporary stockpiling of materials onsite. There will be some exhaust emissions generated from the use of machinery during the construction phase of the Proposed Development. An assessment of the potential effect of the Proposed Development with regard to the generation of dust is addressed in Chapter 8 of this EIAR.

6.5.1.7 Geological Heritage Sites

The closest heritage site is the Ridge of Portlaoise (Site Code: LS029), located approximately 1km east of the Proposed Development. There are no geological heritage sites located within the site of the Proposed Development and the construction works for the Proposed Development will occur outside the identified heritage sites. However, in the absence of avoidance and mitigation measures, in a worst-case scenario, there is a potential for fuel spill

from the works area flowing overland and entering the downgradient geological heritage site. In this unlikely scenario, there is a potential 'negative' 'moderate' and 'medium-term' effect on the receiving geological heritage site. The effect is considered moderate and non-significant in the context of the EIA Directive, given the scale of the feature, and that any effect would be localised.

6.5.1.8 Geological Hazards

The site is not located within an area associated with karst geology and therefore, there are no identified risks associated with karst features during the limited excavation needed for the construction of the TCC and associated works and the site clearance. The predicted effects are considered to be imperceptible and not significant in the context of the EIA Directive.

Earthquakes are not likely to occur in the vicinity of the Proposed Development site at a sufficient intensity to pose a risk for the Proposed Development. The GSI database indicates that the Proposed Development is located within an area of low susceptibility to landslides. Furthermore, the restoration plan will ensure that there are no land stability issues in the longer term associated with the Proposed Development. Therefore, there are no potential ground stability hazards identified for the Proposed Development site.

6.5.1.9 Radon

The site is not located within a High-Radon area, therefore, the predicted effects are considered to be imperceptible and not significant in the context of the EIA Directive. Furthermore, any potential impacts associated with radon and human health are assessed in Chapter 4 of this EIAR.

6.5.2 Operational Phase

This phase of the Proposed Development will consist of the infilling of the site with clean soil and stone (materials which meet the definition of by-product as defined in Article 27¹) and the subsequent regrading of the works. During the operational phase, decommissioning of the TCC and the required associated works will also be undertaken.

6.5.2.1 Land Take and Land Use

The operational phase of the Proposed Development will include the infilling and recontouring of approximately 2.52ha (total area of the site 2.92ha), which will change the use of the site from primarily bog area (i.e., cutover bog) to grasslands for agricultural use following the infilling of the lands during the operational phase.

As a result, the development will involve an unavoidable land take, however, the land take will be used for agricultural use, leading to a 'positive', 'significant', and 'permanent' effect on land and soil, particularly when assessed in the context of optimisation of land use. This is considered significant in the context of the EIA Directive.

¹ Article 27 of the European Communities (Waste Directive) Regulations, 2011, allows an "economic operator" to decide, under certain circumstances, that a material is a by-product and not a waste.

6.5.2.2 Permanent Alteration of Landform and Soil Profile

During the operational phase of the Proposed Development, the infilling and recontouring works will permanently modify the existing ground levels and landform of the site. The placement of Article 27 soil and stone (by-products) will create a new engineered soil horizon above the existing peat, resulting in a long-term change to the current geomorphology and soil profile.

The imported material will consist of clean, inert soil and stone from greenfield sources and it will be confirmed as uncontaminated prior to import (in accordance with the nation by product criteria - Article 27 requirements) and suitable for use at the site. The change to the landform represents an intentional and permanent alteration to land and soil. However, the alteration of the landform will lead to a 'positive' change, 'significant' and 'permanent' effect on land and soil and is considered 'significant' in the context of the EIA Directive.

6.5.2.3 Importation of Fill Materials

The importation and infilling of the site with Article 27 soil and stone (by-product), even certified as clean, inert and suitable for reuse, may alter the natural soil environment (i.e., peat) by adding material with different grain size, density, permeability and structural properties, which will result in a permanent change to the soil's physical characteristics of the site. Additionally, the creation of the new soil layer (i.e., soil and stone) will influence the geotechnical behaviour. This will lead to a 'neutral' change, 'slight' and 'permanent' effect on land and soil and is considered 'non-significant' in the context of the EIA Directive.

Nevertheless, the Proposed Development will allow for the recovery and reuse of good quality, inert soils and stones that may otherwise be diverted to landfill in the absence of the Proposed Development, with loss of soil and stone resources. Therefore, the Proposed Development will result in an overall 'positive', 'slight to moderate' and 'long term' impact by preventing loss of soil and geological resources to landfill and using this material for restoration purposes.

6.5.2.4 Soil Structure

The infilling of the site with Article 27 soil and stone (by-product) and construction traffic (i.e., movement of machinery across the site) may compress the underlying peat layer, which is highly sensitive to loading. This compaction can lead to changes in the soil's moisture content (i.e., reducing pore space (porosity)), temperature, increasing bulk density and altering the geotechnical behaviour of the peat.

Over time, the peat may undergo gradual consolidation or differential settlement due to loading (i.e., imported material), which can influence the stability of the recontoured landform. The combined effects will have a potential 'negative', 'moderate' and 'long-term' effect on the performance of the soil structure and are considered significant in the context of the EIA Directive.

Additionally, the importation, handling, spreading and grading of Article 27 soil and stone (by-product) may create areas of loose material due to poor compaction of the imported material layer. This may also result in the exposure of the materials to various elements, including weather and be prone to erosion by wind or surface movement before it has stabilised, which may lead to localised loss of material, uneven settlement and mobilisation of fine particles within the site. These effects are confined to the operational works period and diminish once the landform is compacted and stabilised. The combined effects of exposure to elements,

construction traffic, and compaction will have a potential 'negative to neutral', 'temporary' and 'short-term' effect and is considered non-significant in the context of the EIA Directive.

6.5.2.5 Dust Generation

As per the impacts during the construction phase of the Proposed Development, there is a potential for windblown dust generation at the site during the operational phase. An assessment of the potential effect of the Proposed Development with regard to the generation of dust is addressed in Chapter 8 of this EIAR.

6.5.2.6 Soil Quality and Contamination

As in the construction phase of the Proposed Development, there is a potential for accidental release of deleterious materials during the operational phase of the Proposed Development, which could result in a 'negative', 'moderate to significant', 'long-term' effect in the absence of mitigation, and is considered significant in the context of the EIA Directive. This worst-case scenario is deemed unlikely to occur.

The Proposed Development will only accept clean soil and stone from construction sites classified as Article 27 (by-product) in accordance with the EPA guidelines (Guidance on Soil and Stone By-products in the context of Article 27 of the European Communities (Waste Directive) Regulations 2011, (EPA, 2019)). During the excavation works at the origin site, only clean, inert materials, free from contamination, invasive species and other anthropogenic inclusions, will be accepted for use at the site, thereby preventing the introduction of potential contaminant sources. The infill materials imported to the site will be from known and reputable sources which will be previously inspected and will be in accordance with all relevant statutory consents for both the source sites and the Proposed Development site.

Assuming that all statutory obligations have been addressed with regards to identification and designation of imported materials as Article 27 compliant, it is anticipated that the Proposed Development will have a 'neutral', 'imperceptible' and 'long term' impact on the site and origin sites and is considered non-significant in the context of the EIA Directive.

6.5.3 Potential Cumulative Effects

Cumulative effects can be defined as "effects that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project". Effects which are caused by the interaction of effects, or by associated or offsite projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the accumulation of different effects that are individually minor. Such effects are not caused or controlled by the project developer.

The consideration of potential cumulative effects is an important stage in the EIA process. Although the Proposed Development may not result in significant residual effects in isolation, when the Proposed Development is considered cumulatively with other projects, significant residual effects may occur. Therefore, as part of this assessment, other offsite developments and proposed offsite developments as detailed in Chapter 2 of this EIAR were reviewed and considered for possible cumulative effects with the Proposed Development.

6.5.3.1 Construction Phase

There will be no cumulative effects on land, soil and geology during the construction phase of the Proposed Development, given the minimal site excavation and importation of stone for the establishment of the TCC and associated works. Additionally, material excavated onsite during this phase will be reused onsite during the operational phase and any low level of waste material (i.e., from site workers/delivery drivers) occurring during this phase will be disposed of in accordance with all statutory obligations. It is planned that any material excavated in the course of the construction works will be stored onsite, ideally close to the excavation location and reused where it is appropriate to do so. As such, offsite disposal of this material is not anticipated.

6.5.3.2 Operational Phase

Surplus Material

It is envisaged that all excavated material during the construction phase will be reused onsite during the infilling of the site. However, in the case that any surplus material needs to be removed offsite, it will be managed in accordance with the by-product provisions of Article 27 of the European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011), as amended. A by-product assessment shall be undertaken to demonstrate that any such surplus material satisfies all four conditions set out in Article 27 prior to its removal from the site. However, given the low quantities of material removed from the site, it is considered that any cumulative effect on lands, soils and geology associated with the Proposed Development will be 'neutral', 'imperceptible' and 'permanent' and is considered non-significant in the context of the EIA Directive.

Import of Aggregates and Materials

The importation of materials to the Proposed Development may be sourced from the same donor site as other permitted developments detailed in Chapter 2 of this EIAR, if required, and within the wider Laois Area. All soil and stone imported to the site for infilling and recontouring purposes shall be monitored in accordance with the requirements of Article 27 of the European Communities (Waste Directive) Regulations 2011 and the EPA Guidance on Soil and Stone By-Products (EPA, 2019). This will ensure that only clean, inert materials, free from contamination, invasive species and other anthropogenic inclusions, are accepted for use at the site, thereby preventing the introduction of potential contaminant sources. Therefore, regardless of the number of other projects and developments using aggregates from the same source sites, there will be an 'indirect', 'neutral', 'imperceptible' and 'permanent' effect on the geological environment at the source site and it is considered non-significant in the context of the EIA Directive.

There are no other cumulative effects associated with land, soil and geology associated with the construction phase of the Proposed Development.

6.5.4 "Do Nothing" Effect

The 'Do Nothing' scenario it is considered that the Proposed Development did not proceed and the potential effect on the receiving land, soils, and geological environment is considered.

In the 'Do Nothing' scenario, there would be no change or resulting effect on the nature of the site with respect to land, soil and geology, as the site of the Proposed Development would

remain as an open bog in the immediate term. Therefore, the potential positive impact through the restoration of the site to significantly improved agricultural lands would not occur, and the importation of clean soil and stone under Article 27 (by-products) would also not occur. Therefore, there would not be an improvement on the land for agricultural use.

6.6 Avoidance, Remedial & Mitigation Measures

The mitigation measures as outlined below, will ensure that there will be no significant effect on the receiving land, soil and geology.

6.6.1 Construction Phase

During the construction phase, all works will be undertaken in accordance with the Outline Construction Environmental Management Plan (OCEMP) (Lenztech, 2023) and the Resource and Waste Management Plan (RWMP) (DNV, 2026b; submitted with the planning application under separate cover). Following appointment, the contractor will be required to prepare and develop a site-specific CEMP and RWMP to provide detailed construction phasing and methods to manage and prevent any potential emissions to ground and surface water with regard to the relevant industry standards (e.g., Guidance for Consultants and Contractors, CIRIA-C532', CIRIA, 2001). The OCEMP and RWMP will be implemented for the duration of the construction phase, covering construction and waste management activities that will take place during the construction phase of the Proposed Development.

Mitigation works will be adopted as part of the construction works for the Proposed Development. These measures will address the main activities of potential impact, which include:

- Management and Control Procedures for the Importation of Aggregates and Materials.
- Control and Management of Soils, Subsoils and Stockpiles.
- Management and Control for the Reuse of Soil.
- Management and Control of Surplus Material.
- Control and Handling of Fuel and Hazardous Materials.
- Accidental Release of Contaminants.
- Appropriate Fuel and Chemical Handling, Transport and Storage.

6.6.1.1 Import of Aggregates and Materials

There will be limited quantities of aggregates imported to the site during the construction phase of the Proposed Development. However, contract and procurement procedures will ensure that all imported aggregates and materials required for the construction phase of the Proposed Development will be sourced from reputable suppliers operating in a sustainable manner and in accordance with industry conformity/compliance standards and statutory obligations.

The importation of aggregates and materials will be subject to management and control procedures, which will include testing for contaminants, invasive species and other anthropogenic inclusions and assessment of the suitability for use in accordance with engineering and environmental specifications for the Proposed Development. As a result, any unsuitable material will be identified prior to unloading / placement onsite, thereby ensuring environmental protection and compliance with regulatory requirements.

6.6.1.2 Airborne Dust Generation

Dust and fine particle generation during the site clearance, construction of the TCC, widening of the road and associated works can be substantially reduced through the selection of adequate mitigation techniques and effective management. The most effective technique is to control dust at source and prevent it from becoming airborne by implementing the following mitigation measures:

- Excavated soils and vegetation during the site clearance works will be carefully managed and maintained in order to minimise potential effect on soil quality and soil structure.
- Handling of soils and materials will be undertaken in accordance with documented procedures outlined in the OCEMP and RWMP that will be set out in order to protect ground and minimise airborne dust.
- The normal measures required to prevent airborne dust emissions and associated nuisance arising from site work will be in place, including measures to prevent uncovered soil drying out, leading to wind pick up of dust and mud being spread onto the local road network and adjoining properties.
- Vehicles travelling on any unsurfaced site roads shall have their speed restricted to 20 kph.
- Dust dispersal over the site boundary shall be minimised using methods as necessary.
- The main contractor shall allocate suitably qualified personnel to be responsible for ensuring the generation of dust is minimised and effectively controlled.

Potential effects and avoidance and mitigation measures associated with generation of dust are addressed in Chapter 8 of this EIAR in detail.

6.6.1.3 Reuse of Soil

There will be limited excavations at the site during the construction phase. However, it is expected that the excavated material will be reused onsite as part of the infilling works (i.e., operational phase).

- All topsoil stripping associated with the Proposed Development will be monitored by a suitably qualified consultant.
- Excavated soil that is not suitable for reuse will be removed from the site by a suitable contractor licensed under the Waste Management Act 1996 and relevant regulations.
- Any soil reused onsite will be monitored for the occurrence of invasive plant species with follow-up treatment.

6.6.1.4 Management and Control of Soils and Stockpiles

Segregation and storage of soils for reuse onsite or removal offsite and material for disposal offsite (i.e., vegetation during the site clearance) will be segregated and temporarily stored onsite pending removal or for reuse in accordance with the OCEMP (Lenztech, 2023), which will be updated by the main contractor in advance of construction works commencing.

Stockpiled materials, pending reuse onsite, will be located away from the location of any sensitive receptors (i.e., drains / watercourses). An excavation/stockpile register will be maintained onsite.

The reuse of suitable excavated soil and subsoil for the Proposed Development will be undertaken in accordance with the final recontouring design for the Proposed Development.

Stockpiling of excavated material (i.e., soils and subsoils) r, where required (i.e., awaiting reuse onsite or removal offsite), will be appropriately managed onsite during the construction phase of the Proposed Development in accordance with the measures outlined in the OCEMP (Lenztech, 2023). To minimise the overall effect on soils arising during the construction works, the following mitigation measures will be adhered to.

- A suitable temporary storage area will be identified and designated.
- All stockpiles will be assigned a stockpile number.
- Material identified for reuse onsite, offsite and waste materials will be individually segregated; and all segregation, storage & stockpiling locations will be clearly delineated on the site drawings.
- Soil stockpiles will be covered to prevent runoff from the stockpiled material generation and/or the generation of dust.
- Topsoil should not be stored in piles of greater than two metres in height as the soil matrix (internal structure) can be damaged beyond repair. It should also be kept as dry as possible and used as soon as possible to reduce any deterioration through lengthy storage and excess moving around the site.
- Any waste that will be temporarily stored / stockpiled will be stored on impermeable surface high-grade polythene sheeting, hardstand areas or skips to prevent cross-contamination of the soil below or cross-contamination with soil.
- Regular watering will take place to ensure the moisture content is high enough to increase the stability of the soil and thus suppress dust.
- Stockpiles of materials shall be kept to a minimum and if necessary, they shall be kept away from sensitive receptors.

6.6.1.5 Soil Structure

The extent of the required work area at the site will be minimised where appropriate to prevent unnecessary excavation of soil and tracking over soil, subsoil and vegetation outside of the excavation work areas and site clearance areas as a result of compaction and rutting from construction traffic.

Soil including topsoil and subsoil will be segregated and stored appropriately to prevent deterioration of soil structure and quality to ensure the material will be suitable for reuse onsite.

6.6.1.6 Export of Resource (Soil and Subsoil)

Surplus materials will be removed offsite, if required, in accordance with the requirements outlined in the OCEMP (Lenztech, 2023) and the RWMP (DNV, 2026b) and will be managed in accordance with all legal obligations.

The removal of soil offsite, if required, will be undertaken in accordance with all statutory requirements and obligations including, where appropriate, reuse as by-product in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011 (SI No. 126 of 2011) as amended. Any surplus material not suitable for reuse as a by-product and other waste materials arising from the construction phase will be removed offsite by an authorised contractor and sent to the appropriately authorised receiving facility. As only authorised facilities will be used, the potential effects at any authorised receiving facility sites will have been adequately assessed and mitigated as part of the statutory consent procedures.

Any excess material will be documented prior to leaving the site. All information will be entered into a waste management register kept on the site.

Vehicles transporting material with potential for dust emissions to an offsite location shall be enclosed or covered with a tarpaulin at all times to restrict the escape of dust.

Public roads outside the site will be regularly inspected for cleanliness, as a minimum on a daily basis, and cleaned as necessary. Where required, trucks entering / leaving the site will pass through a dry wheel washing system. The wheels of all lorries will be cleaned as required prior to leaving the site to prevent the generation of dust or cause the build-up of aggregates and fine material in the public domain. The correct use and management of the wheel washing system (where required) will be undertaken by the main contractor to ensure that there is no harm or effect to the receiving water environment.

6.6.1.7 Handling of Fuels, Chemicals and Materials

Fuelling and lubrication of equipment will be carried out in accordance with the procedures outlined in the OCEMP (Lenztech, 2023), in a designated area of the site (i.e., bunded areas within the site compound only) away from any watercourses and drains (where not possible to carry out such activities offsite) with full attendance of plant operatives.

Fuel will not be stored onsite for the duration of the construction phase. Fuel will only be brought to site via mobile fuel bowser. Any other oils or hydraulic oils stored onsite will be stored in designated areas in suitable tanks and containers. These areas will be bunded and located away from surface water drainage and features (i.e., bunded compounds at the Contractor's compound on flat ground or at a location at least 50m from any watercourse or other water conducting features).

- All other fuels, oils and potential contaminants, as well as waste oils, will be stored within the site compound in secure, fit for purpose containers within bunded containment as appropriate and in accordance CIRIA guidance documents (Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors-2001, Environmental Good Practice on Site-C650), EPA "IPC Guidance Note on Storage and transfer of Materials for Scheduled Activities" and with SEPA guidance (GPP 2: Above ground oil storage tanks, January 2018).
- Bunds will have regard to Environmental Protection Agency Guidelines 'Amendment to IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities' (EPA, 2013). All tank and drum storage areas will, as a minimum, be bunded to a volume not less than the greater of the following:
 - 110% of the capacity of the largest tank or drum within the bunded area; or
 - 25% of the total volume of substance that could be stored within the bunded area.
- Vehicle refuelling will take place either within the compound at a dedicated impermeable refuelling pad or by mobile double bunded bowzers at their place of work.
- The refuelling pad would be bunded and equipped with a collection sump.
- Suitable bunded areas will be installed for oil and petrol storage tanks.
- Refuelling would be carried out using an approved mobile fuel bowser with a suitable pump and hose.
- Designated fuel filling points will be put in place with appropriate oil and petrol interceptors to provide protection from accidental spills.

- No refuelling is permitted on site, i.e. within the river or adjacent due to risk of spillage.
- Absorbent material (spill kits) would be available onsite and would be deployed to contain drips and small spillages.
- Maintenance of mobile plant will take place within the construction compounds only and would comply with CIRIA guidance documents and SEPA PPG 7 (The safe operation of refuelling facilities, July 2011).
- Only emergency breakdown maintenance will be carried out onsite.
- Strict supervision of contractors will be adhered to in order to ensure that all plant and equipment utilised onsite is in good working condition.
- Any equipment not meeting the required standard will not be permitted for use within the Proposed Development site.
- Drip trays and spill kits will be available onsite to ensure that any spills from vehicles are contained and removed offsite.
- Spill kits will be made available and kept onsite at all times and identified with signage for use in the event of an environmental spill or leak.
- A spill kit will be kept in close proximity to the fuel storage area for use in the event of any incident during refuelling or maintenance works.
- Spill kits will be provided by the main contractor to cater for any other spills.
- Method statements for dealing with accidental spillages will be provided the Contractor for review by the Employer's Representative.
- There may also be the requirement for use of portable generators or similar fuel containing equipment during the construction phase of the Proposed Development, which will be placed on suitable drip trays. Regular monitoring of drip tray content will be undertaken to ensure sufficient capacity is maintained at all times.
- The local authority will be informed immediately of any spillage or pollution incident that may occur onsite during the construction phase.

6.6.1.8 Emergency Procedures

Emergency procedures will be developed by the appointed contractor in advance of works commencing and spillage kits will be available onsite including in vehicles operating onsite. Remedial action will be immediately implemented to address any potential effects in accordance with industry standards and legislative requirements, which will ensure minimal risk to the receiving hydrological and hydrogeological environment associated with the construction phase of the Proposed Development. The following mitigation measures will be adhered to as follows:

- Any required emergency vehicle or equipment maintenance work will take place in a designated impermeable area within the Proposed Development site.
- Emergency response procedures and contingency plans will be put in place, in the unlikely event of emergency accidents (i.e., spillages of fuels or lubricants).
- Spill kits, including oil absorbent material, will be provided and available onsite, so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained.
- In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the Proposed Development site and compliantly disposed offsite. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure

will be undertaken in accordance with industry best practice procedures, standards and EPA guidelines.

- All site staff (i.e., construction staff) staff will be familiar with the emergency procedures in the event of accidental fuel spillages.
- All construction works staff onsite will be fully trained on the use of equipment.

This procedure will be undertaken in accordance with industry best practice procedures and standards. These measures will ensure that there is minimal risk to the receiving land, soil and geology associated with the construction stage of the Proposed Development.

6.6.1.9 Welfare Facilities

Welfare facilities have the potential, if not managed appropriately, to release organic and other contaminants to ground or surface water courses. Foul drainage from temporary welfare facilities during the construction phase of the Proposed Development will be discharged to temporary holding tank(s) the contents of which will periodically be tankered offsite to a licensed facility. All waste from welfare facilities will be managed in accordance with the relevant statutory obligations by an appropriately authorised contractor.

6.6.2 Operational Phase

In addition to the mitigation measures outlined in Section 6.6.1, which remain applicable during the operational phase, where required, additional mitigation measures have been identified for the operational phase of the Proposed Development.

6.6.2.1 Article 27 By-products Control

Contract and procurement procedures will ensure that all imported uncontaminated soil and stone materials required for the infilling and recontouring of the site under Article 27 of the European Communities (Waste Directive) Regulations 2011 are sourced from reputable suppliers operating in a sustainable manner and in accordance with industry conformity standards, statutory obligations, and the relevant provisions of the RWMP (DNV, 2026b) ensuring that such materials are not considered waste and are suitable for beneficial use.

- Quality control procedures will be in place to check and verify all materials imported for restoration at site are acceptable. The importation of clean soil and stone (Article 27 by-product) as per EPA guidelines (EPA, 2019) will be subject to robust management and control procedures.
- Material imported to the site under Article 27 must be demonstrated to be clean, inert and suitable for reuse.
- All soil and stone imported to the site for infilling and recontouring purposes shall be monitored in accordance with the requirements of Article 27 of the European Communities (Waste Directive) Regulations 2011 and the EPA Guidance on Soil and Stone By-Products (EPA, 2019). This will ensure that only clean, inert materials, free from contamination, invasive species and other anthropogenic inclusions, are accepted for use at the site, thereby preventing the introduction of potential contaminant sources.
- Any and all materials imported to the site for recovery will be inspected on delivery and prior to unloading / placement on the site. As a result, any unsuitable material will be

identified prior to unloading or placement on site, thereby ensuring environmental protection and compliance with regulatory requirements.

- Only surplus construction material (soil and stone) will be transferred to the infill lands.
- Priority shall be given to greenfield soil and stone sources, defined as material derived from previously undeveloped lands. Each greenfield source shall be supported by:
 - Confirmation of greenfield status.
 - Article 27 registration and/or notification.
 - A Material Producer's Declaration and associated Statement of Conformity confirming that the material qualifies as a by-product under Article 27 and is suitable for use at the receiving site.
 - Source information will be reviewed and approved prior to the importation of material to the site.
- For any infrequent or once-off irregular material delivery access, a designated operator and assigned keyholder will be tasked with the transfer of the low volumes. This will assist in controlling access and ensure the continued recovery of only suitable licenced material at the development lands used for infilling and recontouring works.
- Material transferred to the site will be distributed in locations making it suitable for regrading.
- Where soil and stone are proposed to be imported from non-greenfield or previously developed sources, additional supporting information may be required to demonstrate geochemical suitability. This may include soil analytical data and/or a source-specific risk assessment, as appropriate, in accordance with EPA (2019) guidance.
- Any material received from an unapproved or unverified source, or which fails to meet the Article 27 acceptance criteria, shall be rejected and shall not be incorporated into the infill.

In addition, the reprofiling (i.e., regrading) of the surface will be carried out to allow for the planting of native grassland. The reprofiling works will be supervised by a qualified landscape architect or equivalent to ensure that the filling is carried out in a manner that will derive maximum benefit from this.

6.6.3 "Worst Case" Scenario

The potential accidental release of hazardous material, including fuels, or other hazardous materials being used onsite could potentially effect on the receiving land, soil and geological environment. This scenario would only occur through the failure of secondary containment or a major incident on the site. Furthermore, the potential for inadvertent importation of non-compliant or contaminated material to the site could also result in an effect in the absence of appropriate quality-control procedures. However, the implementation of strict material acceptance controls, Article 27 compliance checks, and standard pollution prevention measures would ensure that these risks are effectively avoided.

Taking account the mitigation measures, any environmental harm would be avoided. There would therefore be a 'neutral', 'imperceptible' and 'short-term' effect on the receiving environment. These worst-case scenarios are deemed to be unlikely to occur.

6.7 Residual Effects

Residual effects are defined as 'effects that are predicted to remain after all assessments and mitigation measures'. They are the remaining 'environmental costs' of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse effects.

The predicted effects of the construction phase and operational phase of the Proposed Development are described in Section 6.5 in terms of quality, significance, extent, likelihood, and duration.

These assessments informed the development of a comprehensive suite of mitigation measures as detailed in Section 6.6. The effectiveness of these measures was assessed in terms of their ability to break pollutant linkages and reduce the magnitude and likelihood of effects. The residual effects, which take these measures into account, are summarised in Table 6-4.

Overall, considering the avoidance, remedial and mitigation measures detailed in Section 6.6, the residual effects regarding the construction phase and operational phase of the Proposed Development are considered 'positive', 'imperceptible' and 'permanent' to the receiving environment (land, soil and geology) and considered non-significant in the context of the EIA Directive.

Table 6-4. Summary of Residual Effects

Activity	Attribute	Predicted Effect	Quality	Significance	Duration	Type	Mitigation	Residual Effect
Construction Phase								
Construction of the Proposed Development	Land Take and Land Use	The Proposed Development will require approximately 11.5m ² in size for the establishment of the TCC and will change from undeveloped grasslands to agricultural land use.	Neutral	Slight	Temporary	Direct	Unavoidable and no mitigation required. The Proposed Development will improve the land for future agricultural use.	Imperceptible
Excavation and Removal of Soil and Subsoil Not Suitable for Reuse Onsite	Soils and Subsoils	The construction of the Proposed Development will require limited excavation of soil and subsoil. It is intended to reuse the excavated material from the construction phase for the infilling and recontouring phase (i.e., operational phase). Any potential surplus and unsuitable material will require removal offsite.	Neutral	Not significant	Temporary	Direct	None required. Where possible, it is intended to retain and reuse suitable excavated soil. The removal of surplus soil offsite will be undertaken in accordance with applicable statutory requirements. This may include where suitable, removal as by-products that meet the legislative requirements of Article 27 of the European Communities (Waste Directive) Regulations, 2011 and in accordance with the OCEMP (Lenztech, 2023) and RWMP (DNV, 2026b).	Imperceptible

Activity	Attribute	Predicted Effect	Quality	Significance	Duration	Type	Mitigation	Residual Effect
Reuse of Excavated Soil	Land and Soil	It is intended to reuse the excavated soil and subsoil during the infilling and recontouring phase (i.e., operational phase).	Neutral	Imperceptible	Permanent	Direct	The reuse of soil onsite will be subject to control procedures, which will include soil quality testing to ensure suitability for use onsite.	Imperceptible
Accidental Release of Deleterious Materials (e.g., Fuels or Other Hazardous Materials Being Used Onsite)	Soils and Subsoils	Potential (albeit low) for uncontrolled release of deleterious materials, including fuels and other materials being used onsite, through the failure of secondary and tertiary containment or materials handling accident, to the land, soil, and geological environment.	Negative	Moderate to Significant	Long-Term	Direct / Worst Case	Refueling of plant and storage of any deleterious materials including fuels will be undertaken in accordance with the requirements and procedures outlined in the CEMP.	Imperceptible
Stockpiling of Excavated Soil and Subsoils	Soil Structure	The temporary stockpiling of excavated soils will result in exposure of the materials to various elements including weather.	Negative	Not Significant	Short-term	Direct	The segregation and stockpiling of the excavated material at the site pending reuse or removal offsite will be carefully managed and maintained in order to minimise potential effect on soil quality.	Imperceptible
Import of Aggregates Onsite	Land, Soil and Geology	The Proposed Development will require the importation of	Neutral	Imperceptible	Long-term	Indirect	Only certified materials from authorised sources will be used.	Imperceptible

Activity	Attribute	Predicted Effect	Quality	Significance	Duration	Type	Mitigation	Residual Effect
		aggregates for the construction of roads and utility infrastructure. The potential effects may include loss of attribute and changes in geological setting at the source site.						
Accidental release of deleterious materials	Geological Heritage	There is a potential for runoff from a fuel spill to enter the recorded heritage site located within 1km east of the site.	Negative	Moderate	Medium-term	Direct / Worst-case	There are no geological heritage sites located within the site of the Proposed Development and the construction works will occur outside the identified heritage sites. Regardless, refuelling of plant and storage of any deleterious materials including fuels will be undertaken in accordance with the requirements and procedures outlined in the OCEMP (Lenzteh, 2023).	Imperceptible
Operational Phase								
Infilling and Recontouring	Land and Take Land Use	The Proposed Development will include the infilling and recontouring of approximately 2.52ha (total area of the site 2.92ha) and will change from undeveloped grasslands to agricultural land use.	Positive	Significant	Permanent	Direct	No mitigation required. The Proposed Development will improve the land for agricultural use.	Positive

Activity	Attribute	Predicted Effect	Quality	Significance	Duration	Type	Mitigation	Residual Effect
Recontouring (i.e., Soil Profile)	Land, Soil and Geology	It is intended to use Article 27 clean soil and stone (by-products) from reputable sources for the infilling phase which will create a new soil horizon over the existing cutover bog.	Positive	Significant	Permanent	Direct	No mitigation required. The Proposed Development will improve the landform of the land for agricultural use.	Imperceptible
Imported Material - Infilling	Land, Soil and Geology	The Proposed Development will require the infilling of the site with clean soil and stone from Article 27 (by-products).	Neutral	Slight	Permanent	Direct	Only clean, inert Article 27 soil and stone will be accepted, verified through origin-site documentation, occasional sampling and analysis where required, and onsite inspection of all loads, with full records maintained and any non-compliant material rejected. It will be undertaken in accordance with the requirements and procedures outlined in the EPA guideline (Guidance on Soil and Stone By-products (EPA, 2019)).	Imperceptible
Recovery of Soil	Land, Soils and Geology at Source Site	Potential loss of attribute at the source site.	Positive	Slight to Moderate	Long-Term	Secondary	The Proposed Development will divert the loss of valuable soil resource to landfill. Contract and	Imperceptible

Activity	Attribute	Predicted Effect	Quality	Significance	Duration	Type	Mitigation	Residual Effect
							procurement procedures will ensure that all fill material imported to the site is from a known source in accordance with industry conformity/compliance standards and statutory obligations.	
Infilling (i.e., Soil Structure)	Soils, Subsoils and Geology	Potential for compaction of the peat layer beneath the imported infilled soil and stone (Article 27) material.	Negative	Moderate	Long-Term	Direct	Material will be infilled using low-ground-pressure machinery, controlled trafficking routes, and the placement of imported material in sequential layers to avoid excessive compaction of the underlying peat in accordance with the requirements and procedures outlined in the CEMP.	Imperceptible
Recontouring (i.e., Soil Structure)	Soils, Subsoils and Geology	Potential for the creation of areas of loose material due to poor compaction of the imported material layer.	Negative to Neutral	Temporary	Short-Term	Direct	Controlled placement, appropriate compaction and stabilisation of the imported material, any temporary areas of loose or erodible soil will be addressed and will be stabilised as works	Imperceptible

Activity	Attribute	Predicted Effect	Quality	Significance	Duration	Type	Mitigation	Residual Effect
							progress. Material will be placed in accordance with the requirements of the OCEMP (Lenztech, 2023).	
Accidental Release of Deleterious Materials (e.g., Fuels or Other Hazardous)	Soils and Subsoils	Potential (albeit low) for uncontrolled release of deleterious materials, including fuels and other materials being used onsite, through the failure of secondary and tertiary.	Negative	Moderate to Significant	Long-Term	Direct	Refueling of plant and storage of any deleterious materials including fuels will be undertaken in accordance with the requirements and procedures outlined in the OCEMP.	Imperceptible

6.8 Monitoring

6.8.1 Construction Phase

During the construction phase of the Proposed Development, the following monitoring measures will be considered:

- Routine inspections of construction activities will be carried out on a daily basis by the contractor staff to ensure all controls to prevent environmental effect, relevant to the construction activities taking place at the time, are in place. Environmental inspections will ensure that the works are undertaken in compliance with the OCEMP (Lenztech, 2023).
- Routine monitoring and inspections during refuelling to ensure no effects and compliance with avoidance, remedial and mitigation measures.
- Inspections and monitoring will be undertaken during excavations and other groundworks to ensure that measures that are protective of water quality are fully implemented and effective.

6.8.2 Operational Phase

During the operational phase of the Proposed Development, the following monitoring measures will be considered:

- Daily records and inspections of material transferred to the site for infilling (i.e., Article 27, by-products) will be recorded and supervised at the source of origin and by the main site access / security personnel at the construction site entrance.
- Routine monitoring and inspections during refuelling to ensure no effects and compliance with avoidance, remedial and mitigation measures.
- Any stockpiled material will be monitored for stability and to ensure there are no emissions such as dust or runoff.
- All soil and stone imported to the site for infilling and recontouring purposes shall be monitored in accordance with the requirements of Article 27 of the European Communities (Waste Directive) Regulations 2011 and the EPA Guidance on Soil and Stone By-Products (EPA, 2019). This will ensure that only clean, inert materials, free from contamination, invasive species and other anthropogenic inclusions, are accepted for use at the site, thereby preventing the introduction of potential contaminant sources.
- Priority shall be given to greenfield soil and stone sources, defined as material derived from previously undeveloped lands. Each greenfield source shall be supported by:
 - Confirmation of greenfield status.
 - Article 27 registration and/or notification.
 - A Material Producer's Declaration and associated Statement of Conformity confirming that the material qualifies as a by-product under Article 27 and is suitable for use at the receiving site.
 - Source information will be reviewed and approved prior to the importation of material to the site.

- All loads of imported soil and stone shall be subject to visual inspection on arrival at the site and prior to placement, to confirm the absence of contamination, invasive species, staining, odours or anthropogenic inclusions.
- Where soil and stone are proposed to be imported from non-greenfield or previously developed sources, additional supporting information may be required to demonstrate geochemical suitability. This may include soil analytical data and/or a source-specific risk assessment, as appropriate, in accordance with EPA (2019) guidance.
- Any material received from an unapproved or unverified source, or which fails to meet the Article 27 acceptance criteria, shall be rejected and shall not be incorporated into the infill.

6.9 Interactions

6.9.1 Population and Human Health

An assessment of the potential effect of the Proposed Development on human health is included in Chapter 4 of this EIAR.

There is a potential risk of dust generated from the limited excavation and stockpiling of soil during the construction phase and from infilling and recontouring during the operational phase of the Proposed Development, posing a human health risk in the absence of standard avoidance and mitigation measures, which will be implemented to be protective of human health.

Appropriate industry standards and health and safety legislative requirements will be implemented during the construction phase of the Proposed Development that will be protective of site workers.

6.9.2 Biodiversity

An assessment of the potential effects of the Proposed Development on the biodiversity of the site, particularly habitats, flora and fauna that may be effected by the excavation, stockpiling, infilling and recontouring of materials during the construction and operational phase of the Proposed Development is provided in Chapter 5 of this EIAR. It also provides an assessment of the effects of the Proposed Development on habitats and species, particularly those protected by national and international legislation or considered to be of particular conservation importance and proposes measures for the mitigation of these effects.

6.9.3 Hydrology and Hydrogeology

An assessment of the potential effect of the Proposed Development on the hydrological and hydrogeological environment is included in Chapter 7 of this volume.

In the absence of avoidance, remedial, and mitigation measures, construction and operational activities may potentially create pathways for potential sources of contamination to enter underlying groundwater. Activities at the site will involve the use of potentially hazardous materials such as fuels, oils, and other substances. An uncontrolled release of these materials, whether through containment failure or handling accidents, could effect the surrounding environment. In addition, in the absence of avoidance, remedial and mitigation measures, there is a potential for sediment to enter the drainage ditches and potentially discharge to the

nearby waterbodies. Procedures for the protection of the receiving water environment are set out in Chapter 7 of this EIAR.

6.9.4 Air Quality and Climate

The limited excavation of soils, temporary stockpiling, infilling and recontouring which will occur at the site have the potential to generate nuisance effects (i.e., dust) during the construction and operational phase of the Proposed Development. An assessment of the potential effect of the Proposed Development on air quality is included in Chapter 8 of this EIAR.

6.9.5 Landscape and Visual

During the construction phase and into the operational phase of the Proposed Development, the site landscape will undergo a change from cutover bog to recontoured agricultural lands. An assessment of the potential effect of the Proposed Development on the receiving landscape is included in Chapter 11 of this EIAR.

6.9.6 Material Assets: Waste, Traffic and Transport

The Proposed Development will include site clearance (i.e., removal of vegetation, silt fences, etc.) with and offsite removal of surplus material, construction of the TCC and associated works, widening of the access road, with subsequent infilling and recontouring. Where possible, it is intended to retain and reuse the limited excavated topsoil and subsoil on the site during the construction phase of the Proposed Development. However, where required, unsuitable soil and subsoil will be removed offsite in accordance with all statutory legislation.

An assessment of the potential effect of the Proposed Development on the material assets (traffic and transport and waste management) during the construction and operations phase of the Proposed Development is included in Chapter 13 and Chapter 14 of this EIAR, respectively

6.10 Difficulties Encountered When Compiling

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

6.11 Conclusion

Overall, considering the avoidance, remedial and mitigation measures, the residual effects regarding the construction phase and operational phase of the Proposed Development are considered 'imperceptible' to the receiving environment (land, soil and geology) and considered non-significant in the context of the EIA Directive.

6.12 References

Construction Industry Research and Information Association (2015) Environmental good practice on Site guide (CIRIA -C741).

Construction Industry Research and Information Association, 2001. Control of Water Pollution from Construction Sites. Guidance for Consultants and Contractors (CIRIA – C532).

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7 HYDROLOGY AND HYDROGEOLOGY

7.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) provides a description of the hydrology and hydrogeology (water) environment within and immediately surrounding the site of the Proposed Development and an assessment of the potential impacts of the Proposed Development on hydrology and hydrogeology and sets out any required mitigation measures where appropriate.

The principal objectives of this chapter are to identify:

- Hydrological and hydrogeological characteristics of the receiving environment at the Site of the Proposed Development.
- Potential impacts that the Proposed Development may have on the receiving water environment.
- Potential constraints that the environmental attributes may place on the Proposed Development.
- Required mitigation measures which may be necessary to minimise any adverse impacts related to the Proposed Development.
- Evaluate the significance of any residual impacts.

This chapter of the EIAR should be read in conjunction with Chapter 4 Population and Human Health, Chapter 5 Biodiversity, Chapter 6 Land and Soil, Chapter 8 Air Quality, Chapter 11 Landscape and Visual Impact and Chapter 14 Material Assets: Waste of the EIAR and other information provided by the Applicant pertaining to the design proposals for the Proposed Development.

7.1.1 Quality Assurance and Competency of Experts

The chapter was prepared by Nuria Manzanar a Principal Consultant of DNV with 12 years' experience in contaminated land and hydrogeological assessments.

The chapter was reviewed by Gareth Carroll BA BEng MEnvSc, a Principal Consultant of DNV with over 13 years' experience in environmental assessment of brownfield and greenfield sites for a range of project types and geological and hydrogeological site settings.

The report was approved by Patrick Higgins BSc, MSc, MEnvSc, CEnv. Patrick is a Chartered Environmentalist (CEnv) with IES with over 20 years' experience of preparing environmental and hydrogeological assessments for a range of project types and geological and hydrogeological site settings, and is a Technical Director with DNV, who is professionally competent and accredited to undertake hydrogeological assessments.

7.2 Study Methodology

7.2.1 Relevant Legislation & Guidance

The methodology adopted for the assessment has regard to the relevant guidelines and legislation including:

- Council Directive 2006/118/EEC, 2006. On the protection of groundwater against pollution and deterioration. European Parliament and the Council of European Communities.
- 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 with amendments 2455/2001/EC, 2008/32/EC and 2008/105/EC (Water Framework Directive (WFD)).
- European Commission, 2022. WFD Reporting Guidance 2022. Final Draft V4.
- Act No. 30/2007, Water Services Act 2007 as amended.
- Act No. 21/1990, Local Government (Water Pollution) (Amendment) Act, 1990 as amended.
- Act No. 1/1977, Local Government (Water Pollution) Act, 1977 as amended.
- S.I. No. 722/2003 – European Communities (Water Policy) Regulations 2003 as amended.
- S.I. No. 489/2011 – European Communities (Technical Specifications for the Chemical Analysis and Monitoring of Water Status) Regulations, 2011.
- S.I. No. 122/2010 – European Communities (Assessment and Management of Flood Risks) Regulations 2010 as amended.
- S.I. No. 272/2009 - European Communities Environmental Objectives (Surface Waters) Regulations 2009 as amended.
- S.I. No. 9 of 2010 - European Communities Environmental Objectives (Groundwater) Regulations 2010 as amended.
- Transport for Ireland (TII), 2009. Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.
- WFD Working Group, 2005. Guidance on the Assessment of the Impact of Groundwater Abstractions (WFD, 2005).
- Laois County Council, 2021. Laois County Development Plan 2021-2027.

The construction works will be managed in accordance with all statutory obligations and regulations and with standard international best practice. Other guidance used in the assessment of potential impacts on the receiving water environment includes:

- Construction Industry Research and Information Association, 2016. Groundwater Control: Design and Practice (CIRIA – C750).
- Construction Industry Research and Information Association, 2015. Environmental Good Practice on Site Guide (CIRIA – C741).
- CIRIA, 2007. The SuDS Manual (C697).
- CIRIA, 2006. Control of Water Pollution from Linear Construction Projects: Technical Guidance (C648).
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- Environmental Protection Agency, 2013. Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites.
- Environmental Protection Agency, May 2022. Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022).
- Transport for Ireland (TII), 2008. Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes.

7.2.2 Phased Approach

A phased approach was adopted for this EIAR in accordance with Environmental Protection Agency (EPA) and Institute of Geologists of Ireland (IGI) guidelines as set out above and is described in the following sections.

Element 1: An initial assessment and impact determination stage was carried out by DNV to establish the project location, type and scale of the Proposed Development, the baseline conditions, and the type of hydrological and hydrogeological environment, to establish the activities associated with the Proposed Development and to undertake an initial assessment and impact determination. This element of the assessment also included developing the Conceptual Site Model (CSM) for the site and the receiving environment.

This stage of the assessment included a desktop study that comprised a review of published environmental information for the site. The study area, for the purposes of assessing the baseline conditions for this chapter of the EIAR, extends beyond the site boundaries to include a 2km radius of the Proposed Development site. Potential environmental receptors outside of this radius that are potentially hydraulically connected with the site were also considered. The extent of the wider study area was based on the Institute of Geologists of Ireland (IGI) Guidelines (IGI, 2013) that recommends a minimum distance of 2km radius from the site. This broader area is necessary to identify and evaluate all potential receptors that could be affected by the Proposed Development, either directly or indirectly. The distinction between the application site and the study area is crucial. The site of the Proposed Development is the focal point of the Proposed Development, while the study area includes any potential hydrogeological / hydrological connections to sensitive receptors including habitats that might experience secondary effects.

The desk study involved collecting all the relevant data for the site and surrounding area including published information and details pertaining to the Proposed Development provided by the Applicant and the design team. DNV completed two walkover surveys on 9th December 2025 and on 26th January 2026.

The Element 1 stage of the assessment was completed by DNV and included the review of the following sources of information:

- Environmental Protection Agency (EPA) webmapping (EPA, 2026).
- Geological Survey Ireland (GSI) Datasets Public Viewer and Groundwater webmapping (GSI, 2026).
- National Parks and Wildlife Services (NPWS) webmapping (NPWS, 2026).
- Ordnance Survey Ireland (OSI) webmapping (OSI, 2026).
- Water Framework Directive Ireland (WFD) webmapping (WFD, 2026).
- Teagasc webmapping (Teagasc, 2026).
- Office of Public Works (OPW) database on historic flooding and the Catchment Flood Risk Assessment and Management (CFRAM) maps (OPW, 2026).
- Information provided by the Applicant pertaining to the design proposals for the Proposed Development.

Other documents and reports reviewed as part of this assessment included the following:

- DNV, 2026a. Hydrogeological Risk Assessment (submitted with the planning application under separate cover).
- DNV, 2026b. Resource and Waste Management Plan (submitted with the planning application under separate cover).

Element 2: Involves direct and indirect site investigation and studies stage, where necessary to refine the CSM developed as part of Element 1 and evaluate the potential impacts associated with the Proposed Development. Based on a review of the information compiled and assessed as part of Element 1, including the findings of walkover surveys, it was determined that no direct or indirect site investigations or additional studies were required. Sufficient baseline information was available for the Proposed Development to inform a robust assessment of the potential impacts of the Proposed Development on the receiving hydrological and hydrogeological environment.

Element 3: Evaluation of Mitigation Measures, Residual Impacts and Final Impact Assessment was based on the outcome of the information gathered in Element 1 and Element 2 of the assessment. Mitigation measures to address all identified adverse impacts that were identified in Element 1 and Element 2 of the assessment were considered in relation to the Construction Phase and Operational Phase of the Proposed Development. These mitigation measures were then considered in the impact assessment to identify any residual impacts.

Element 4: Completion of the Hydrology and Hydrogeology sections of the EIAR in this Chapter which includes all the associated figures and documents.

7.2.3 Description of Importance of the Receiving Environment

The Transport Infrastructure Ireland (TII) criteria for rating of the importance of hydrogeological features at the site as documented in the National Roads Authority Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA, 2009), are summarised in Table 7-1.

Table 7-1. Criteria for Rating Site Importance of Hydrogeological Features

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 European Union (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 – e.g., NHA status. Regionally important potable water source supplying >2500 homes. Inner source protection area for a regionally important water source. Quality Class A (Biotic Index Q4, Q5). Flood plain protecting more than 50 residential or commercial properties from flooding.
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. Quality Class B (Biotic Index Q3-4). 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.	Locally Important Aquifer. Potable water source supplying >50 homes. Outer source protection area for locally important water source. Quality Class C (Biotic Index Q3, Q2- 3). Flood plain protecting between 1 and 5 residential or commercial properties from flooding.
Low	Attribute has a low quality or value on a local scale.	Poor Bedrock Aquifer. Potable water source supplying <50 homes. 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.

7.2.4 Description and Assessment of Potential Impacts

Impacts will vary in quality from negative to neutral or positive. The effects of impacts will vary in significance on the receiving environment. Effects will also vary in duration. The terminology and methodology used for assessing the 'impact', significance and the corresponding 'effect' throughout this chapter are described in Table 7-2 in accordance with EPA, 2022 guidelines on the information to be contained in EIARs.

Table 7-2. Criteria for Assessment of Potential Impacts Terminology and Methodology

Quality of Effects/Impacts	Definition
Negative	A change which reduces the quality of the environment.
Neutral	No effects or effects that are imperceptible, within the normal bounds of variation or within the margin of forecasting error.
Positive	A change that improves the quality of the environment.
Significance of Effects / Impacts	Definition
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant Effects	An effect which, by its character, magnitude, duration, or intensity, alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration, or intensity, significantly alters a sensitive aspect of the environment.
Profound Effects	An effect which obliterates sensitive characteristics.
Extend and Context of Effects	Definition
Extend	Describe the size of the area, the number of sites and the proportion of a population affected by an effect.
Context	Describe whether the extent, duration or frequency will conform or contrast with established (baseline) conditions.
Probability of Effects	Definition
Likely Effects	The effects that can reasonably be expected to occur because of the planned project, if all mitigation measures are properly implemented.
Unlikely	The effects that can reasonably be expected not to occur because of the planned project, if all mitigation measures are properly implemented.
Duration of Effects / Impacts	Definition
Momentary	Effects lasting from seconds to minutes.
Brief	Effects lasting less than a day.
Temporary	Effects lasting one year or less.

Short-term	Effects lasting one to seven years.
Medium-term	Effects lasting seven to fifteen years.
Long-term	Effects lasting fifteen to sixty years.
Permanent	Effects lasting over sixty years.
Reversible	Effects that can be undone, for example through remediation or restoration.
Types of Effects	Definition
Indirect Effects	Effects on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
Cumulative Effects	The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects.
"Do-nothing" Effects	The environment as it would be in the future, should the subject project not be carried out.
"Worst-case" Effects	The effects arising from a project in the case where mitigation measures substantially fail.
Indeterminable Effects	When the full consequences of a change in the environment cannot be described.
Irreversible Effects	When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
Residual Effects	The degree of environmental change that will occur after the proposed mitigation measures have taken effect.

Figure 7-1 identifies how comparing the character of the predicted effect to the sensitivity of the receiving environment can determine the significance of the effect.

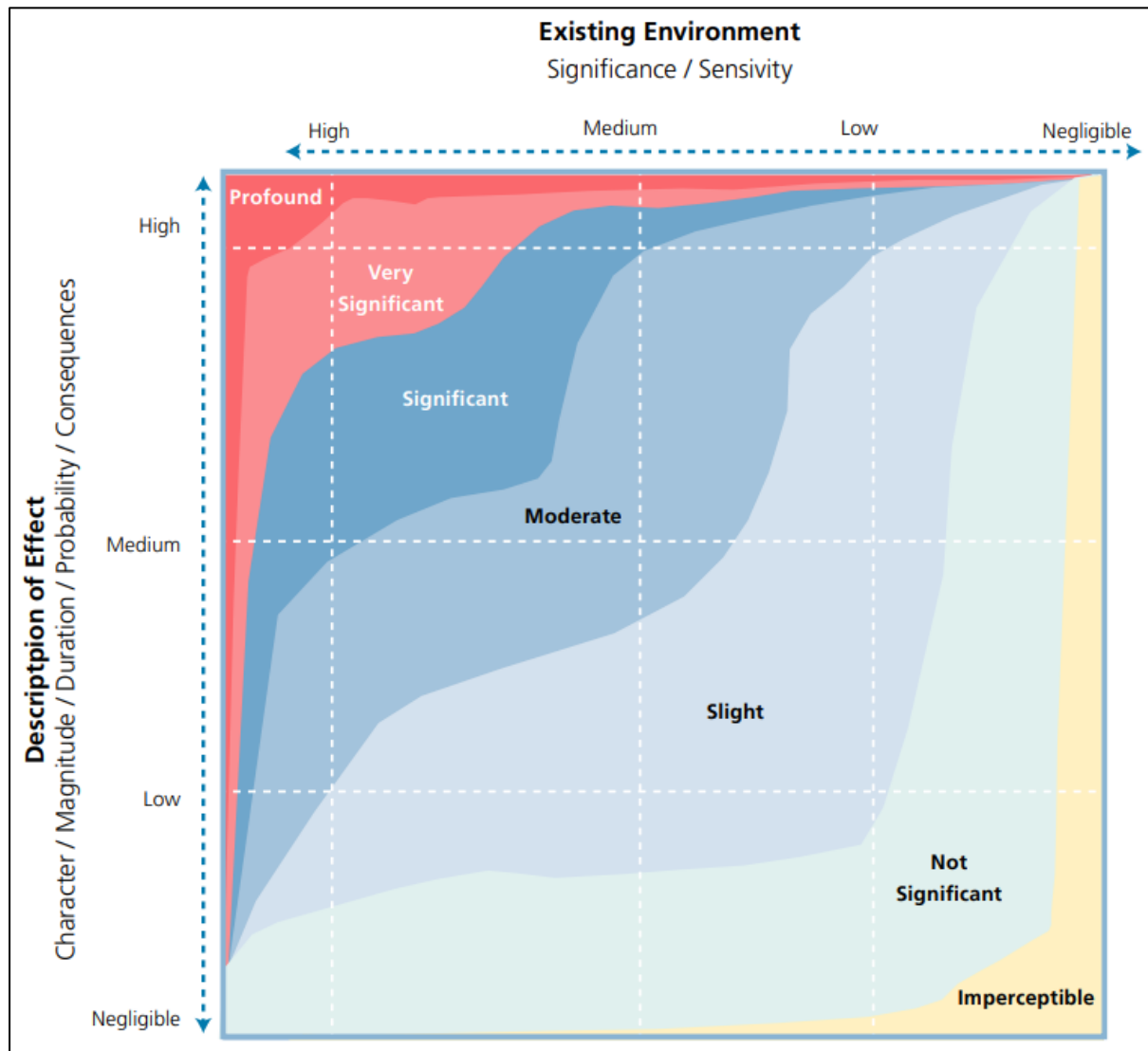


Figure 7-1. Determining Significance

7.3 The Existing and Receiving Environment (Baseline Situation)

7.3.1 Site Location and Surrounding Land Use

The site is approximately 2.57km north of Portlaoise town centre and is located between Portlaoise to the southeast and Mountmellick to the northwest. Access to the site is provided via the L2117 local primary road located to the southeast of the site, through an established private access that also serves adjoining third-party lands to the north. The L2117 joins with the national secondary route, the N80, at a controlled junction located approximately 900m southwest of the site.

The lands immediately adjoining the site to the north and west consist of a combination of uncultivated land and areas of existing industrial activity. Lands directly to the west of the site comprise agricultural lands associated with established dairy and beef farming enterprises.

The former Portlaoise Landfill facility is located approximately 750 metres southwest of the site, which now functions as a recycling centre (Portlaoise Waste and Recycling facility). A

number of industrial and waste-related facilities are located approximately 400 metres west of the Proposed Development, each operating under existing waste licences.

A full description of the site location and surrounding land use is presented in Chapter 2 of this EIAR.

The site location is presented in Figure 7-2.

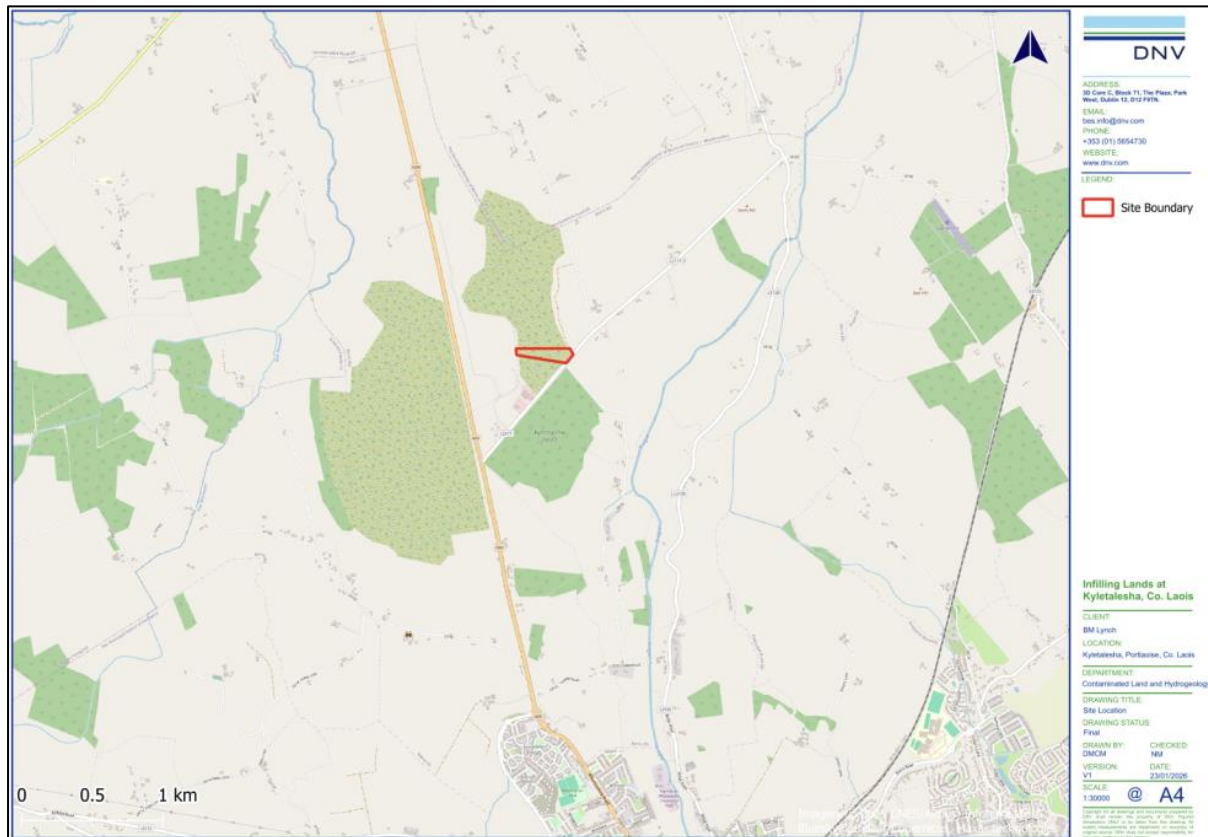


Figure 7-2. Site Location

7.3.2 Current and Historic Land Use

The site of the Proposed Development is located within the eastern edge of the Clonreher Bog . Although the precise historical land-use is not documented, it is considered likely that limited, non-commercial peat extraction took place on the lands at the site in the past. Following the cessation of the limited peat-related activity, the lands regenerated naturally and have remained unused for productive agricultural purposes due to wet ground conditions. As a result, the site has become overgrown with ground-cover vegetation and self-seeding trees (refer to Figure 7-3).

The ground at the site is wet underfoot and is characterised by an overgrowth of self-seeded trees and ground vegetation that has established over-time following the cessation of peat-related activity. The existing ground conditions render the lands unsuitable for agricultural use and pose risks to both farm machinery and livestock.

Ground levels are below the local primary road level and decline gradually in a westerly direction.

The lands immediately adjoining the site to the north and west consist of a combination of uncultivated land and areas of existing industrial activity. Lands directly to the west of the site comprise agricultural lands associated with established dairy and beef farming enterprises.

Surrounding lands comprise a mix of agricultural holdings, uncultivated areas, and established industrial and waste-related operations, reflecting a long-standing pattern of mixed rural and industrial land use in this locality.

The wider area has an extensive history of waste-related activity, including the former Portlaoise Landfill and a number of licensed waste and industrial facilities located within proximity to the site. However, there is no record of previous extraction, development, or landfilling activity on the Proposed Development site itself, which forms part of the historical cutover bog footprint of Clonreher Bog.

The planning history relevant to the site is summarised in Chapter 3 of this EIAR.

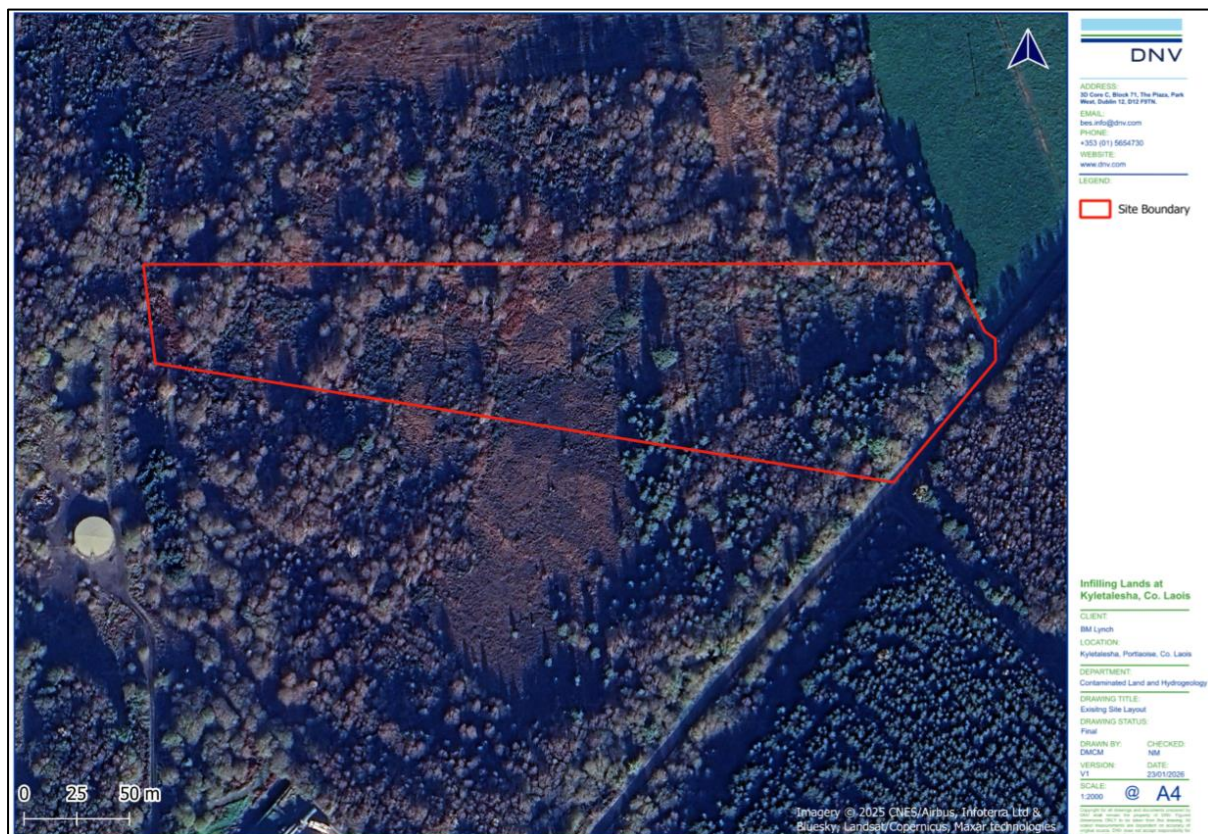


Figure 7-3. Current Site Layout

7.3.3 Soil, Subsoil and Geology

The soils and geology at the subject site are described and assessed in Chapter 6 (Land and Soil) of this EIAR and are summarised as follows:

- The soils beneath the majority of the site are mapped by Teagasc (Teagasc, 2026) as poorly drained cutover peat (IFS Soil Code: Cut). A small area of the eastern portion of the site is mapped as poorly drained mineral (mainly basic) soil (IFS Soil Code: BminPD).

- The quaternary sediments or subsoils beneath the majority of the site are mapped by the GSI (GSI, 2026) as cutover raised peat. A small area of the eastern portion of the site is mapped as till derived from Lower Carboniferous limestone (TLs) (GSI, 2026).
- The bedrock beneath the site is mapped by the GSI (GSI, 2026) as the Ballysteen Formation (Code: CDBALL), described as dark muddy limestone and shale.
- The GSI (GSI, 2026) records for karst features indicate that there are no karst features within a 2km radius of the Proposed Development site. The closest karst feature is a borehole (KARST40KID: IE_GSI_KARST_40K_2459) located 2.7km east of the site boundary.

7.3.4 Rainfall

Monthly rainfall data available for 1km x 1km grids (for the period 1991 to 2020) was sourced from Met Éireann (Met Éireann, 2026) and is presented in Table 7-3.

Table 7-3. Long Term Mean Monthly Rainfall Data (mm/month)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
92	72.7	67.9	64.3	64.3	71.4	71.6	82.1	74.3	100.6	98.9	98.5	958.6
Note: 1km x 1km Irish Grid Coordinated selected for the Site =X (Easting): 245000, Y (Northing): 203000												

The closest synoptic meteorological station to the site is at Oak Park, which is located approximately 34km southeast of the site and Proposed Development. The average potential evapotranspiration (PE) from the Oak Park Station for the period 2023 to 2025 (Met Éireann, 2026) is presented in Table 7-4.

Table 7-4. Average Potential Evapotranspiration (mm/month)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
10.9	19.5	35.8	58.7	86.4	92.4	87.1	76.9	48.1	26.4	12.1	11.3	565.8

7.3.5 Hydrogeology

7.3.5.1 Groundwater Body and Flow Regimes

The bedrock aquifer beneath the site is within the Portlaoise Groundwater Body (GWB) (EU Code: IE_SE_G_107).

The Portlaoise GWB Report (GSI, 2026) identifies that the main diffuse recharge mechanism for the aquifer occurs across the area where there is thin or permeable subsoil. However, point recharge may occur along the boundary between the sandstones of the Slieve Bloom Mts. and the limestones of this GWB. The main discharge mechanism of this aquifer is to the surface waterbodies overlying it as baseflow along riverbeds, also via springs and to the Bagenalstown GWB located beside the Portlaoise GWB.

The topography of this groundwater body (Portlaoise GWB) can be considered in separate areas. The highest elevations are to the south in the foothills of Slieve Bloom, west of Portlaoise where the drainage direction is to the north to Mountmellick, where it turns eastward and then south at Monasterevin. To the east there is a drainage divide at Clonygowan, south of this surface drainage is to the south to meet the Barrow between Mountmellick and

Portarlinton. North of this, the flow in the River Cushina is to the east towards the Derrylea Bog. In the northern section of the groundwater body the elevation decreases from the north with the Figile River flowing south to meet the Cushina east of the Derrylea Bog (GSI, 2026).

Groundwater flow paths are considered to be short, there may be dissolution of the limestone along fractures but it is not likely to continue to great depths. Groundwater flow is considered to occur at shallow depths and the age of the groundwater is young. This groundwater body is not expected to have regionally developed karstic flow systems, however, locally may have a developed karst system in local areas, which concentrates recharge and discharges it at a spring.

7.3.5.2 Aquifer Classification

The GSI provides a methodology for aquifer classification based on resource value (regionally important, locally important and poor) and vulnerability (extreme, high, moderate or low). Resource value refers to the scale and production potential of the aquifer whilst vulnerability refers to the ease with which groundwater may be contaminated by human activities (vulnerability classification primarily based on the permeability and thickness of subsoils).

The bedrock aquifer within the Ballysteen Formation (Code: CDBALL) beneath the site is classified by the GSI (GSI, 2026) as a Locally Important Aquifer - bedrock which is moderately productive only in local zones (LI).

Locally important aquifers are capable of supplying locally important abstractions (e.g. smaller public water supplies, group schemes), or 'good' yields (100-400m³/d). Groundwater flow occurs predominantly through fractures, fissures and joints. However, the poorly connected network of fractures, fissures and joints gives a low fissure permeability which tends to decrease further with depth.

A shallow zone (i.e., fractured/weathered rock) with higher permeability may occur within the top few metres, and also along fault zones. These zones may be able to provide larger 'locally important' supplies of water. However, the lack of connection between the limited fissures results in relatively poor aquifer storage and flow paths that may only extend a few hundred metres. Due to the low permeability and poor storage capacity, the aquifer has a low 'recharge acceptance'. Some recharge in the upper, more fractured/weathered zone is likely to flow along the relatively short flow paths and rapidly discharge to streams, small springs and seeps. Groundwater discharge to streams ('baseflow') can significantly decrease in the drier summer months.

While there are no mapped sand and gravel aquifers at the site of the Proposed Development, the closest sand and gravel aquifer recorded on the GSI mapping (GSI, 2026) is the Portlaoise aquifer, which is a locally important gravel aquifer (Lg) located approximately 0.7km east of the site at its closest point (GSI, 2026).

The bedrock, and sand and gravel aquifers are presented in Figure 7-4.

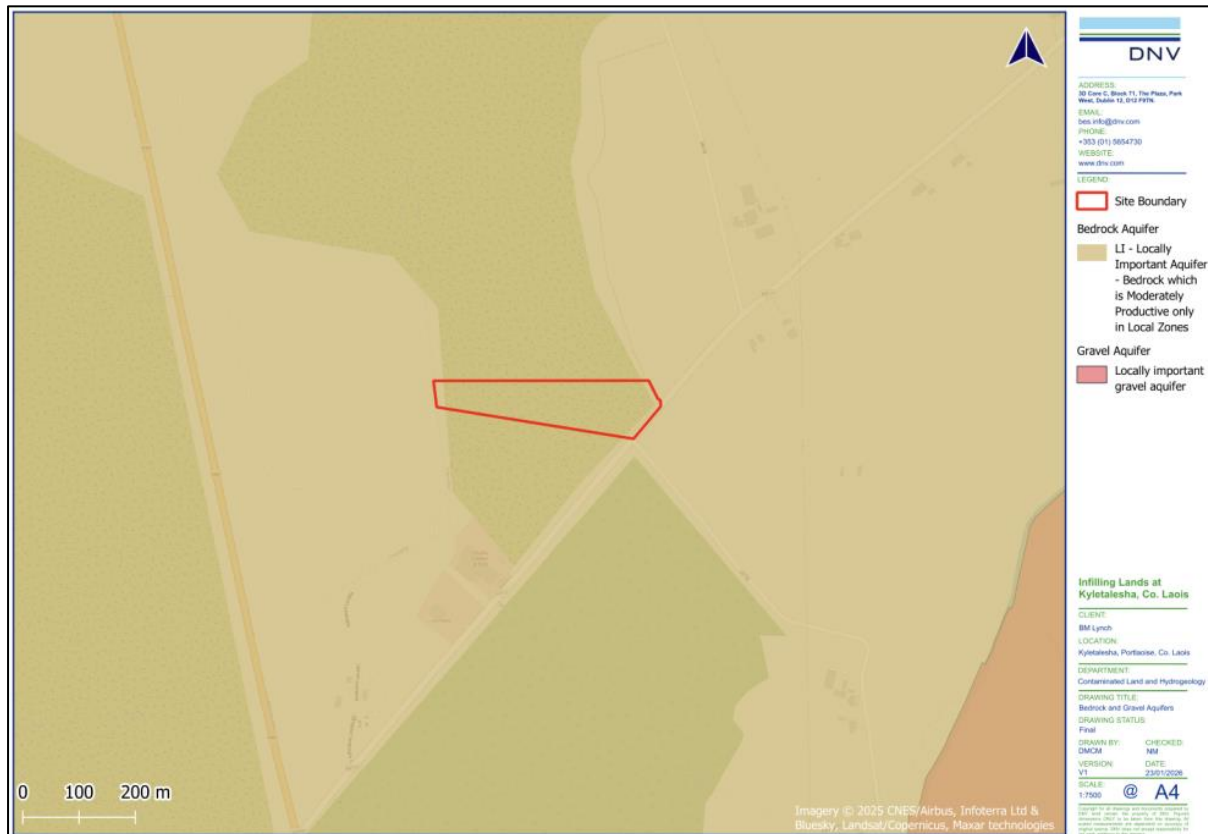


Figure 7-4. Aquifer Classification

7.3.5.3 Groundwater Vulnerability

The vulnerability categories, and methods for determination, are presented in the Groundwater Protection Schemes publication (DEHLG/EPA/GSI, 1999) and summarised in Table 7-5. The publications state that 'as all groundwater is hydrologically connected to the land surface, it is the effectiveness of this connection that determines the relative vulnerability to contamination. Groundwater that readily and quickly receives water (and contaminants) from the land surface is considered to be more vulnerable than groundwater that receives water (and contaminants) more slowly and in lower quantities. The travel time, attenuation capacity and quantity of contaminants are a function of the following natural geological and hydrogeological attributes of any area.

Table 7-5. Vulnerability Mapping Criteria (DEHLG/EPA/GSO, 1999)

Subsoil Thickness	Hydrogeological Requirements				
	Diffuse Recharge			Point Recharge	Unsaturated Zone
	Subsoil Permeability and Type			(Swallow Holes, Losing Streams)	(Sand and Gravel Aquifers Only)
	High Permeability (Sand and Gravel)	Moderate Permeability (Sandy Subsoil)	Low Permeability (Clayey Subsoil, Clay, Peat)		
0-3m	Extreme	Extreme	Extreme	Extreme (30m radius)	Extreme
3-5m	High	High	High	N/A	High

Subsoil Thickness	Hydrogeological Requirements				
	Diffuse Recharge			Point Recharge	Unsaturated Zone
	Subsoil Permeability and Type			(Swallow Holes, Losing Streams)	(Sand and Gravel Aquifers Only)
	High Permeability (Sand and Gravel)	Moderate Permeability (Sandy Subsoil)	Low Permeability (Clayey Subsoil, Clay, Peat)		
5-10m	High	High	Moderate	N/A	High
>10m	High	Moderate	Low	N/A	High

Notes: (i) N/A = not applicable (ii) Permeability classifications relate to the material characteristics as described by the subsoil description and classification method.

The GSI has assigned a groundwater vulnerability rating of 'Moderate' (M) for the bedrock aquifer beneath the site. Based on the moderate vulnerability and low permeability subsoils beneath the site, the anticipated depth to bedrock is between 5 metres below ground level (mbgl) and 10mbgl.

The groundwater vulnerability map is presented in Figure 7-5.

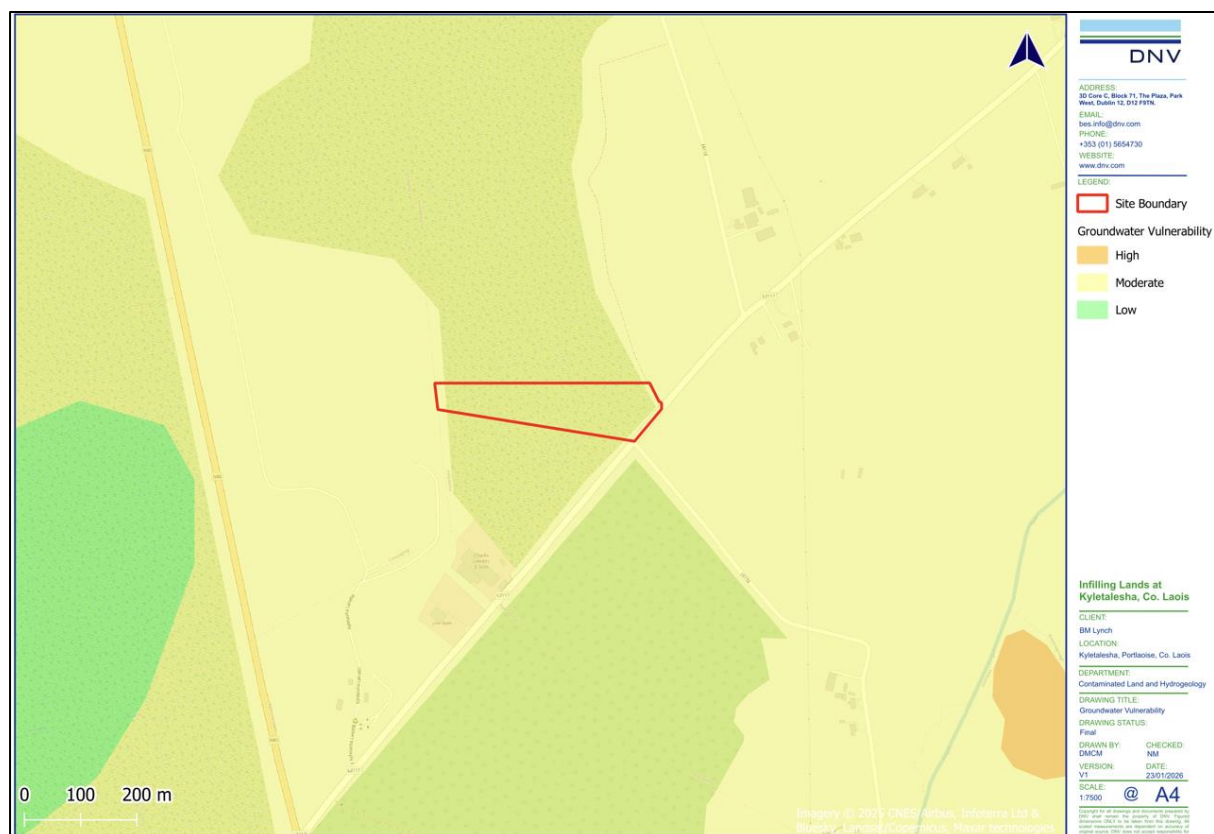


Figure 7-5. Groundwater Vulnerability

7.3.6 Hydrology

7.3.6.1 Catchment and Surface Water Features

The site of the Proposed Development is within the Barrow WFD Catchment (Catchment Code: 14) and the Barrow_SC_020 WFD Sub-catchment (Sub-catchment Code: 14_11). The site has been mapped by the EPA (EPA, 2026) to be within the Triogue_030 WFD River Sub-basin (River Waterbody Code: IE_SE_14T010300).

There are no surface water features recorded on the EPA database (EPA, 2026) within the site boundary. However, during the site walkover undertaken by DNV, a number of field drains (i.e., drainage ditches) were identified throughout the site. The existing drainage ditches were observed to flow in a southerly direction (i.e., north to south). A drainage ditch present along the western boundary of the site, which will be retained as part of the proposed development, turns southeast where it appears to be culverted under the road. This ditch was observed to contain water permanently, whereas the other ditches contained water only during rainfall events.

The closest EPA mapped waterbody to the site is the Kyleclonhobert Stream (WFD Name: Triogue_030, EU Code: IE_SE_14T010300), which is located approximately 0.2km south of the site, and it is a tributary of the Triogue River (WFD Name: Triogue_030, EU Code: IE_SE_14T010300). The stream flows in a southeasterly direction for approximately 980m before discharging into the Triogue River. The Triogue River (Triogue_030) flows a further 2.6km (river length) in a northeasterly direction before discharging into the Triogue River (WFD Name: Triogue_040, EU Code: IE_SE_14T010400), which flows a further 3.9km (river length) also in a northeasterly direction before joining the River Barrow (EPA Code: Barrow_050, EU Code: IE_SE_14B010550).

The Clonreher Stream (WFD Name: Kylegrove Stream_010, EU Code: IE_SE_14K060600), which is located approximately 1km south of the site at its closest point, is a tributary of the Kylegrove Stream (WFD Name: Kylegrove Stream_010, EU Code: IE_SE_14K060600), which flows in a easterly direction before converging into the Kylegrove Stream (WFD Name: Kylegrove Stream_010, EU Code: IE_SE_14K060600) approximately 1.1km south of the site at its closest point. The Kylegrove Stream (WFD Name: Kylegrove Stream_010, EU Code: IE_SE_14K060600), which flows in a northerly direction, is located approximately 1.1km south of the site at its closest point and discharges into the Triogue River (WFD Name: Triogue_030, EU Code: IE_SE_14T010300) approximately 1km southeast of the site at its closest point.

The Clonsoghey Stream (WFD Name: Blackwater (Laois)_010, EU Code: IE_SE_14B031000), tributary to the Blackwater (Laois) Stream, is located approximately 1.2km to the northwest and flows in a northwesterly direction before discharging into the Blackwater (Laois) River approximately 1.8km northwest of the site. The Blackwater (Laois) River (WFD Name: Blackwater (Laois)_010, EU Code: IE_SE_14B031000) is located approximately 1.3km northwest of the site at its closest point and flows in a northerly direction before discharging into the Owenass River (WFD Name: Owenass_020, EU Code: IE_SE_14O010300) approximately 3.6km northwest of the site, which in turn discharges into the River Barrow (EPA Code: Barrow_040, EU Code: IE_SE_14B010550) approximately 6.4km north of the site at its closes point.

The closest coastal waterbody indirectly connected to the site is the Southwestern Irish Sea - Killiney Bay (HA10), which is located approximately 85km east of the site at its closest point. The significance of this connection is considered negligible due to the separation distance from the site.

The surface water features mapped by the EPA (EPA, 2026) within a 2km radius of the site are presented in Figure 7-6.

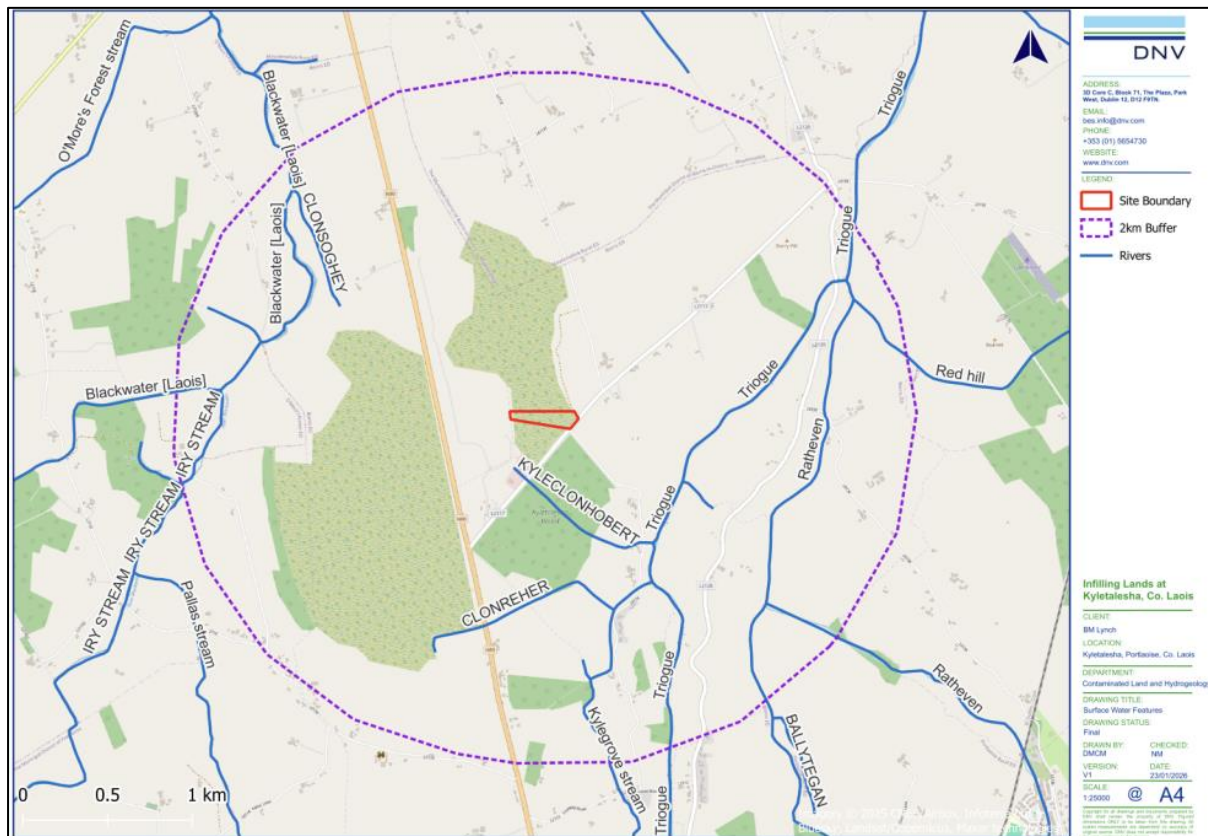


Figure 7-6. Surface Water Features within a 2km Radius of the Site

7.3.6.2 Existing Drainage Infrastructure

There is no surface water or foul water drainage within the site of the Proposed Development.

7.3.7 Flood Risk

As indicated in the Planners Report (Application Reference: 23/200) (LCC, 2023), the site is outside the confines of the critical Flood Zones A and B as indicated in the Strategic Flood Risk Assessment of the Plan.

An initial review of flood risk information was conducted for the site and Proposed Development based on information available from floodinfo.ie (OPW, 2026). This assessment involved an initial flood risk assessment to determine if there were any potential flooding or surface water management issues that might affect the site or the Proposed Development. The results of the initial flood risk assessment indicated that there is no significant flood risk to the site. Consequently, the Proposed Development is deemed appropriate for the site, which is classified as Flood Zone C, indicating a low probability of flooding. Additionally, the

initial flood risk assessment stated that there were no past flood events recorded within a 2.5km radius of the site.

7.3.8 Water Supply and Drinking Water Source Protection

The GSI groundwater wells and springs database (GSI, 2026) was utilised to identify registered wells and groundwater sources in the surrounding area. There are fourteen (14 No.) groundwater sources recorded within a 2km radius of the site.

- Eleven (11 No.) recorded wells of unknown use.
- One (1 No.) recorded well of public supply use.
- One (1 No.) recorded well of agricultural and domestic use.
- One (1 No.) recorded well of domestic use only.

There is one (1 No.) Groundwater Source Protection Areas (SPAs) mapped by the GSI (GSI, 2025) within a 2km radius of the site.

- Mountmellick Derrigile PWS (Public Water Supply) – the Inner Protection Area (SI) is located approximately 1.93km north of the site.

There are other Public Supply Source Protection Areas in the close vicinity of the site, namely the Portlaoise (SI - Inner Protection Area), located approximately 2.4km east of the site, the Meelick (SO – Outer Protection Area), approximately 5.9km southeast of the site and the Knocks PWS (SO - Outer Protection Area) approximately 8.7km southwest of the site.

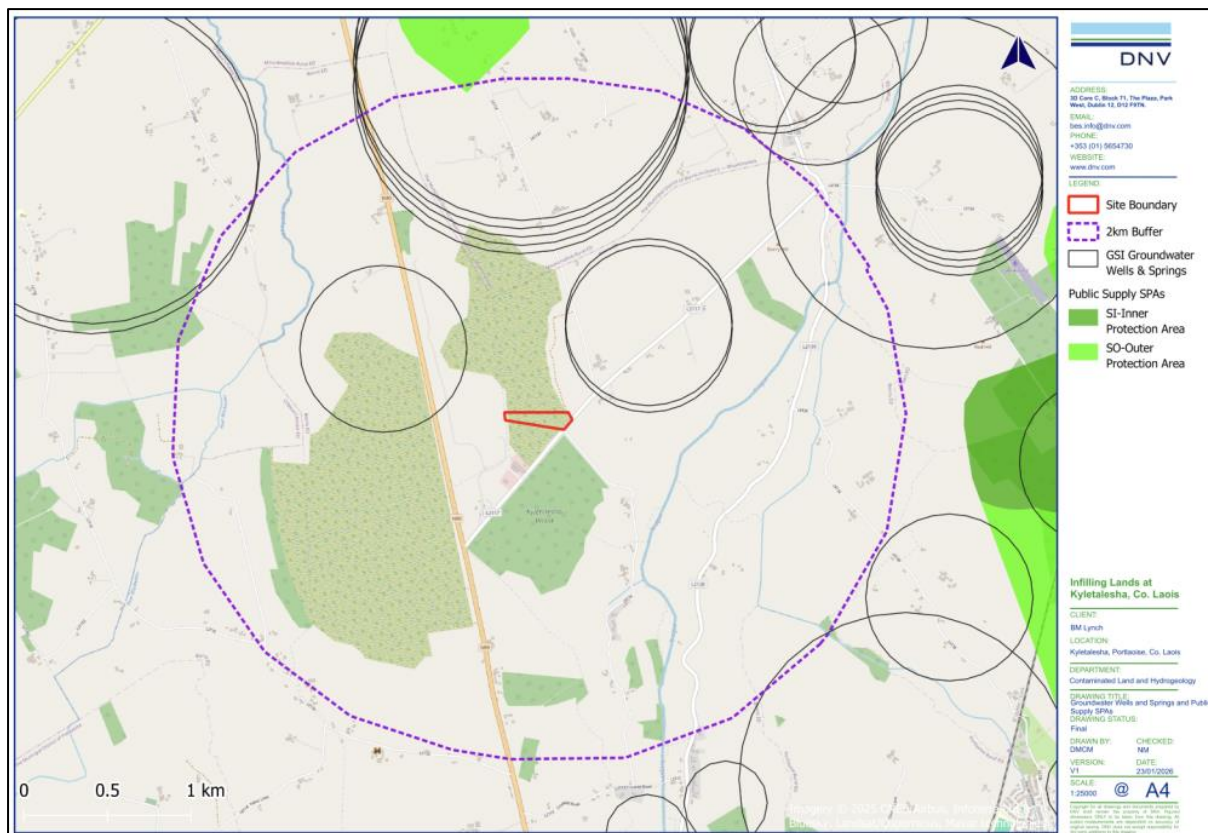


Figure 7-7. Groundwater Wells, Springs and Public Supply SPA's

7.3.9 Water Framework Directive

The WFD status of the water bodies that have a potential hydraulic connection to the site and Proposed Development, as recorded by the EPA (EPA, 2026) in accordance with European Communities (Water Policy) Regulations 2003 (SI no. 722/2003) are provided in Figure 7-7.

Table 7-6. Water Framework Directive Status

Waterbody Name	Waterbody EU Code	Location from Site*	Distance Downstream of the Site (km)*	WFD Status (2019-2024)	WFD Risk	Hydraulic Connection to the Site
River Waterbodies						
Triogue_030	IE_SE_14T010300	South & East	0.2	Poor	At Risk	Potential hydrological or hydrogeological connection via surface water (i.e. drainage ditches at the site) and groundwater flow.
Triogue_040	IE_SE_14T010400	Northeast	2.2	Poor	At Risk	Potential hydrological or hydrogeological connection via the Triogue_030 river.
Kylegrove Stream_010	IE_SE_14K060600	South	1.0	Poor	Review	No hydraulic connection. This river is located south of the Triogue_030 river, which is the closest to the site. Therefore, it is hydrologically isolated from the site, as any potential runoff from the site would be intercepted by the Triogue_030 river.
Blackwater (Laoise)_010	IE_SE_14B031000	Northwest	1.2	Moderate	Not at Risk	No hydro connection - surface water is upgradient of the site and located within a different catchment.
Owenass_020	IE_SE_14O010300	Northwest	3.6	Moderate	At Risk	
River Barrow_050	IE_SE_14B010550	North/Northeast	6.4 / 7.1	Moderate	At Risk	Potential hydro connection via the Triogue_030 river and Triogue_040 river.
Groundwater Bodies						
Portlaoise GWB	IE_SE_G_107	Underlying	0.0	Good	Not at Risk	Underlying groundwater-body.
Note: * - 'denotes distance and direction at its closest point'						

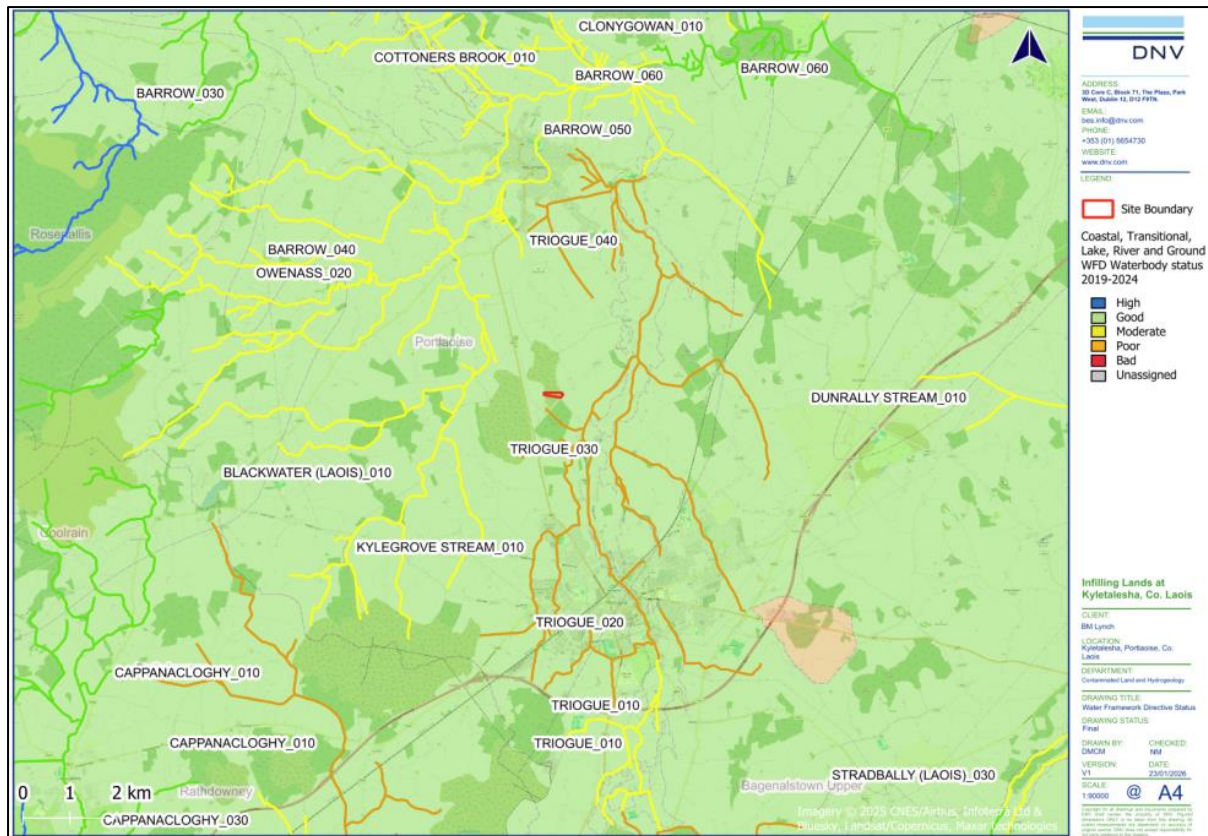


Figure 7-8. Water Framework Directive Status (2019-2024)

7.3.9.1 Nature Conservation

The Habitats Directive (92/43/EEC) seeks to conserve natural habitats and wild fauna and flora by the designation of Special Areas of Conservation (SACs) and the Birds Directive (2009/147/EC) seeks to protect birds of special importance by the designation of Special Protection Areas (SPAs). SACs and SPAs are collectively known as Natura 2000 or European sites (referred to hereafter as Natura 2000 site).

National Heritage Areas (NHAs) are designations under the Wildlife Acts to protect habitats, species, or geology of national importance. The boundaries of many of the NHAs in Ireland overlap with SAC and/or SPA Sites. Although many NHA designations are not yet fully in force under this legislation (referred to as 'proposed NHAs' or pNHAs), they are offered protection in the meantime under planning policy which normally requires that planning authorities give recognition to their ecological value.

There is one (1 No.) Natura 2000 site and five (5 No.) Proposed Natural Heritage Area (pNHA) identified with a potential hydraulic connection to the site and Proposed Development. The Natura 2000 sites and other protected and designated sites or areas within a 15km radius of the site are summarised in Table 7-7.

As documented in the Biodiversity Chapter (Chapter 5), all European sites potentially linked to the Proposed Amendments have been identified and fully assessed in the AA Screening Report (Stage 1 AA) accompanying this submission under separate cover. A summary of the AA conclusion is given below:

'The potential likely significant effects of this development (to use the terminology of the Habitats Directive) are minimal and it cannot be said that this development will have a significant impact on the European site downstream or on the integrity of the Natura 2000 network. It will also not compromise the attainment of the conservation objectives for any site, in particular the River Barrow & River Nore SAC. This finding is based on the best scientific information available. This holds for the project by itself or in combination with other projects in the vicinity and there is no necessity for a Stage 2 assessment (NIS).'

Further details and assessment of the potential impacts of the Proposed Development on habitats, flora and fauna are included in Chapter 5 of this EIAR.

Table 7-7. Designated and Protected Sites

Designated Site	Site Code	Distance from Site (km)	Direction	Potential Risk
Special Area of Conservation (SAC)				
Slieve Bloom Mountains SAC	000412	5.9	West	Not hydrological connection to the site – upgradient of the site.
Mountmellick SAC	002141	6.5	Northeast	Not hydrological connection to the site due to distance.
River Barrow and River Nore SAC	002162	3.6	North	Possible hydraulic connection via the Triogue River and subsequently Barrow River.
Special Protection Area (SPA)				
Slieve Bloom Mountains SPA	004160	5.9	West	Not hydraulically connected to the site – upgradient of the site.
Natural Heritage Area (NHA)				
Clonreher Bog NHA	002357	0.4	East	Not hydraulically connected to the site – upgradient of the site.
Proposed Natural Heritage Area (pNHA)				
Dunamase Wood	001494	7.5	Southeast	Potential hydraulic connection - downgradient of the site.
Rock Of Dunamase	000878	8.48	Southeast	
Kilteale Hill	000867	9.9	Southeast	
Ridge of Portlaoise	000876	0.9	Southeast	
The Great Heath of Portlaoise	000881	6.6	East	
Derries Wood	000416	10.07	Northeast	Not connected to the site – upgradient of the site.
Emo Court	000865	9.1	Northeast	
Shanahoe Marsh	001923	14.6	South	

Designated Site	Site Code	Distance from Site (km)	Direction	Potential Risk
Slieve Bloom Mountains	000412	5.9	West	
Stradbally Hill	001800	14.5	Southeast	
Timahoe Esker	000421	12.9	Southeast	

Note:

'**' = Distance is measured as closest point to the site

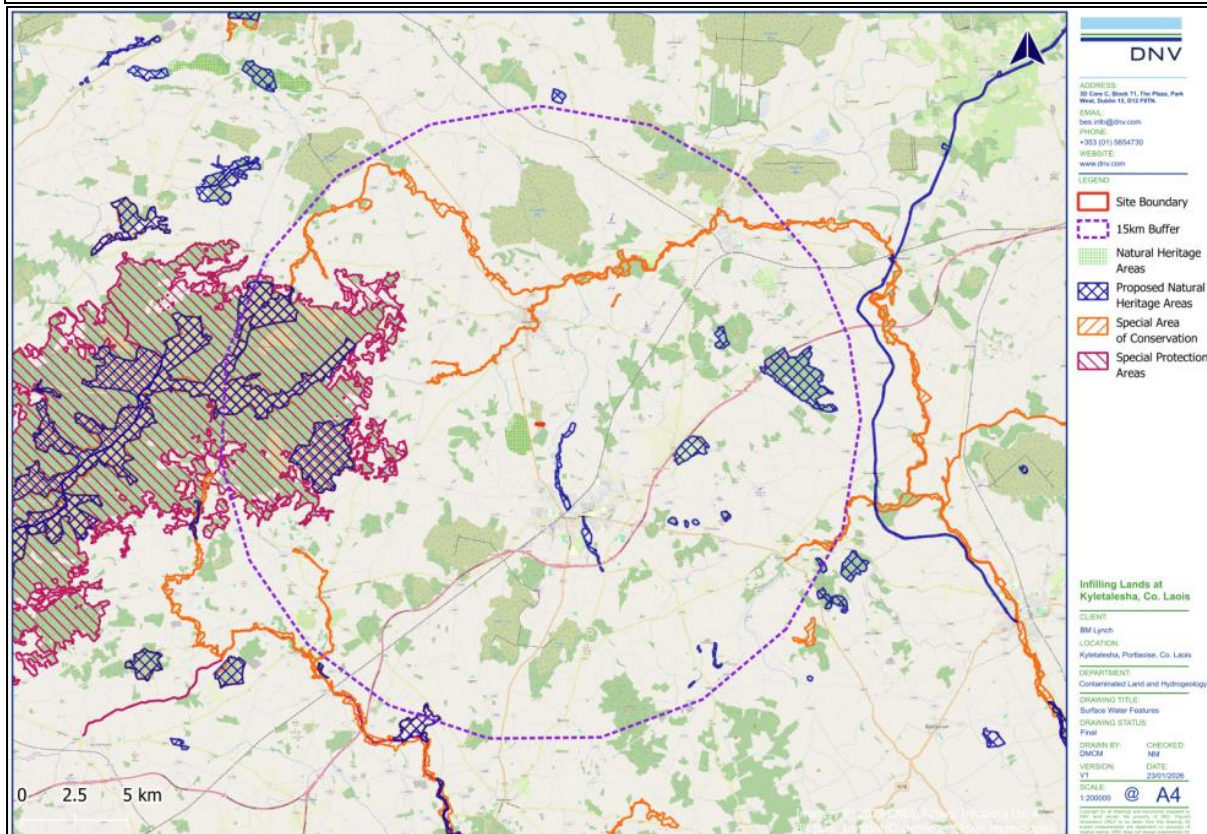


Figure 7-9. Designated and Protected Sites

7.3.9.2 Drinking Water

The river drinking water protected areas (DWPA) are represented by the full extent of the Water Framework Directive (WFD) river waterbodies from which there is a known qualifying abstraction of water for human consumption as defined under Article 7 of the WFD.

There are no surface water drinking water sources, under Article 7 of the Water Framework Directive, identified by the EPA (EPA, 2026) within a 2km radius of the site. However, the groundwater body beneath the site, the Portlaoise GWB (IE_SE_G_107), is classified under Article 7 Abstraction for Drinking Water.

7.3.9.3 Shellfish Areas

Although the Shellfish Waters Directive (SWD) has been repealed, areas used for the production of shellfish that were designated under the SWD, are protected under the WFD as 'areas designated for the protection of economically significant aquatic species'.

The requirement from a WFD perspective is to ensure that water quality does not impact on the quality of shellfish produced for human consumption. In Ireland, 64 areas have been designated as shellfish waters (S.I. No. 268 of 2006, S.I. No. 55 of 2009, S.I. 464 of 2009).

The closest designated Shellfish Area location is Malahide (IE_EA_020_0000) located approximately 89.6km northeast of the site.

7.3.9.4 Nutrient Sensitive Areas

EU member states are required under the Urban Wastewater Treatment Directive (91/271/EEC) to identify nutrient-sensitive areas. These have been defined as “natural freshwater lakes, other freshwater bodies, estuaries and coastal waters which are found to be eutrophic or which in the near future may become eutrophic if protective action is not taken”.

The closest designated nutrient-sensitive area (estuaries and lakes) is the Triogue (River) (IERI_SE_2001_0016- Urban Wastewater Treatment Directive Sensitive Area), located approximately 0.7km east of the site at its closest point.

7.3.9.5 Bathing Waters

Bathing waters are designated under Regulation 5 of Directive 2006/7/EC. Designated Bathing Waters exist under S.I. No. 79/2008 and S.I. No. 351/2011 Bathing Water Quality (Amendment) Regulations 2011. EC Bathing Water Profiles - Best Practice and Guidance 2009.

The closest designated Bathing Water location is the Greystones South (IEEABWC100_0000_0200), located approximately 84.8km northeast of the site.

7.4 Importance of Receiving Environment

The receiving water bodies have been assigned a WFD Status of ‘good’ for groundwater, and ‘poor’ for the closest surface water bodies potentially hydraulically connected to the site of the Proposed Development (EPA, 2026). The bedrock aquifer beneath the site is classified as a locally important aquifer - bedrock, which is moderately productive only in local zones (LI).

Overall, taking account of the receiving hydrological environment, in accordance with the criteria set out in Table 7-1, the site is considered to be of ‘medium’ importance.

7.5 Characteristics of the Proposed Development

This application is to apply for permission for the importation of excavated inert soil and stone and recontouring development on 2.92 hectares (ha), of which 2.52ha is developable for infilling, elongated site comprising low-lying land on the eastern boundary of the former Clonreher bog, partially wooded bogland in a rural location at Kyltalesha.

As documented in the Outline Construction Environmental Management Plan (OCEMP) (Lenztech, 2023), carried out by Lenztech Surveying & Engineering Ltd. on behalf of BM Lynch Construction & Civils, the development is designed to facilitate the recovery of excavated inert soil and stone (by-product) from local greenfield residential development sites and proposes the infilling with an estimated maximum volume of 50,250m³ (85,000 tonnes).

The lands will be recontoured to a maximum height of 2.6m with an average depth of 1.9m, with final recontoured lands remaining below the adjoining local primary road (L2117) level. The infilling of soil and regrading of land will support future agricultural activity, potential forestry, amenity use, or other appropriate land uses within these low-lying lands, which represents the intended end use of the Proposed Development.

The development works will allow for the use of materials as resources, thereby minimising the requirement for the extraction of additional natural resources. Surplus excavated material to be used for infilling will be materials designated as a By-product as defined within Article 27 of the European Communities (Waste Directive) Regulations 2011 typically greenfield soil and stone.

A full description of the Proposed Development is outlined in Chapter 2 of this EIAR.

7.5.1 Construction Phase

The construction phase of the Proposed Development will comprise the following enabling works:

- Site clearance of the entire area.
- Widening of the road.
- Establishment of the construction compound.

The construction phase of the Proposed Development will require the clearance of the majority of self-seeded trees and vegetation across the site, together with a series of enabling works to prepare the area for the subsequent infilling and regrading operations. The roadside boundary hedge on the northern and eastern sides of the site will require partial removal as necessary to facilitate sightlines and access. These preparatory works will include the installation of temporary site fencing, the establishment of buffer strips to adjoining lands, the protection of existing site drainage infrastructure, the construction of a Temporary Construction Compound (TCC), and the formation of the site access, including road widening works.

The location of all drainage features will be identified and surveyed prior to commencement, for record and maintenance purposes. As part of the preparatory works (i.e., construction works) for the site, there will be temporary silt containment barriers put in place in all the identified bog drains graded of material. A 10-meter buffer and silt fence will be maintained along the western boundary of the site, where no soil importation shall take place to protect this surface water (i.e., drainage ditch) and retain its cover of birch and willows. Any other drainage ditches or bog drains will be retained and infilled with clean washed Clause 6A material to TII specification with no fines or dust particles, which shall allow water to flow through it in all directions. They will be maintained and upgraded to filter drains to maintain existing drainage flows.

Welfare facilities, including toilets with sealed waste storage for offsite removal, will be provided for the full duration of the construction phase and operational phase (i.e., infilling and recontouring). These facilities will include provisions for waste management, refuelling, power supply, potable water, and the safe storage of chemicals and materials.

Wheel wash facilities/weighbridge will also be required during the construction and operational phase of the Proposed Development. The selection of any wheel wash system will be

confirmed prior to construction and as part of the planning application. The option of a dry wheel wash system is currently proposed and is suited for heavy machinery and delivery or muck away vehicles to ensure that local roads are kept clean. The dry wheel wash is suited for remote locations as it does not require a water supply to function.

It is expected that the use of cementitious material will be required for foundations to palisade fence post, benching of manhole bases, etc. It is envisaged that approximately 16m³ will be utilised and mixed at the batching plant.

The TCC will be in use for the duration of the operational infilling stages. Refer to Chapter 2 – Description of the Proposed Development of this EIAR.

7.5.1.1 Surface Water Drainage

As documented in the OCEMP (Lenztech, 2023), good practice construction techniques would be adopted for the management of sediment and surface water runoff generated during the construction phase of the Proposed Development.

The new surface water drainage collection network will be provided at commencement (i.e., during the construction phase of the Proposed Development) with the installation of the Sustainable Drainage Systems (SuDS) measures. Any surface water discharge will be via the bypass separator (i.e., catchpit manholes) with an integrated silt collection chamber for disposal to ground onsite via a soakaway (i.e., an infiltration trench sized in accordance with BRE Digest 365 Soakaway Design). In addition, sumps of approximately 600mm depth, within manhole chambers will serve as silt traps to manage siltation with optional use of strainers within the pipe network and manholes during seasonal weather conditions in order to reduce the silting effects of these particles in the network. Runoff from areas of exposed soil will be intercepted by a silt containment barrier installed as good practice in advance of the drainage feature.

Uncontaminated surface runoff from the compound (TCC) will be directed to a swale or infiltration area constructed during the construction phase, to prevent discharge to the existing drainage ditch. The swale will be located at the perimeter of the compound area and will be a wet swale, with runoff infiltrating to ground (i.e., to the existing subsoil). All other runoff from the wider site will continue to follow existing natural drainage patterns and newly installed drainage routes as established above.

7.5.1.2 Foul Drainage

As documented in the Planning Application form, there will be no more than 1-2 people (i.e., delivery driver and plant operator) at the site at any one time.

As documented in the OCEMP (Lenztech, 2023), a combination of a temporary portaloo and an onsite welfare facility cabin with self-contained toilet and washing facilities will be provided for site personnel. No onsite wastewater treatment system or connection to the public mains is required. Effluent and waste from temporary onsite welfare facilities will be maintained, collected and tankered offsite by a licenced waste contractor.

7.5.1.3 Water Supply

As documented in the Planning Application form, there is no proposed source of drinking water supply for the duration of the Proposed Development. There will be no more than 1-2 people

(i.e., delivery driver and plant operator) at the site at any one time. This falls below the Health and Safety Authority (HSA) threshold of 5 persons for full welfare provision. As such, a permanent drinking water supply is not required, and proportionate welfare arrangements are acceptable for this scale of activity.

Potable water will be provided in the form of bottled water for drinking and messing purposes, while welfare units are likely to incorporate built-in water bowisers for sanitation. Electricity will be supplied by onsite generators.

7.5.2 Operational Phase

The operational phase of the Proposed Development will involve the importation, infilling and recontouring of approximately 50,250m³ (85,000tonnes) of inert soil and stone to the site to restore 2.92ha of the total site (with approximately 2.52ha available for development), which will be sourced from local development sites. The material to be imported will meet the criteria for classification as a by-product under Regulation 27 of the European Communities (Waste Directive) Regulations 2011. In addition, a total of 87m³ (150 tonnes) of material from the construction phase will also be reused onsite.

The lands will be recontoured to a maximum height of 2.6metres (m) with an average depth of 1.9m as mentioned in Section 7.5. All finished ground levels will remain below the adjoining local primary road level. The engineering infilling works and recontouring of the site will be completed within the lifetime of any grant of permission and returned for agricultural, forestry planting or amenity use within the 5-year period.

During the operational phase, provisions for surface water drainage, foul drainage and water supply will continue as established during the construction phase of the Proposed Development. Surface water will infiltrate onsite via the SuDS soakaway system, and foul effluent will continue to be contained in sealed tanks and tankered offsite for licensed disposal. Refer to Section 7.5.1. As such, there is no direct discharge to any surface waterbody, including the onsite drainage ditches or the nearby stream/river.

7.6 Potential Impact of the Proposed Development

The procedure for the determination of potential impacts on the receiving hydrological and hydrogeological environment is to identify potential receptors within the site boundary and surrounding environment and use the information gathered during the desk study, the site walkover and information obtained from direct and indirect site investigations to assess the degree to which these receptors will be impacted upon in the absence of mitigation.

The potential impacts associated with the construction phase and operational phase of the Proposed Development are summarised below.

7.6.1 Construction Phase

7.6.1.1 Hydrogeological Flow Regime

As documented in the HRA (DNV, 2026a; refer to Volume 3 Appendix 7.1 of the EIAR), during the construction phase, there will be no direct discharges to or abstractions from groundwater at the Proposed Development. It is anticipated that there will be no requirement for dewatering

at the site. Potable water will be provided in the form of bottled water for drinking and messing purposes.

The Proposed Development will not involve any excavation of bedrock. Some limited excavation of topsoil and subsoil and regrading of soil (i.e., importation of gravel material) will be required for the construction of the TCC and associated works (i.e., widening of the road, parking, etc.). Therefore, there will be no impact on the hydrogeological flow regime during the construction phase of the Proposed Development.

7.6.1.2 Hydrological Flow Regime

During the construction phase, there will be no direct discharges to or abstractions from surface water at the Proposed Development. Diversions of water courses are not required for the construction phase. The existing drainage features (i.e., charted bog/field drains) will be cleared of vegetation and filled with clean washed material to the required specification. They will be maintained and upgraded to filter drains to maintain and improve existing drainage flows. In addition, there will be temporary silt containment barriers (i.e., silt fences) to all identified bog drains graded of material put in place during the construction phase. In addition, silt fencing will also be put along the site boundary and silt traps within the drainage ditches. Surface water drainage will be provided through SuDS designed to infiltrate runoff to ground, and no discharge to surface water bodies or connection to sewers is required.

There will be no abstraction of water for use during construction works (i.e. dust suppression, welfare facilities). Welfare units are likely to incorporate built-in water bowsers for sanitation. Wheel wash is anticipated to use a dry system. Therefore, this may result in a 'positive', 'slight to moderate' and 'permanent' impact on the quality of the drainage ditches present at the site. It is noted that this impact is considered significant in the context of the EIA Directive.

7.6.1.3 Water Quality

During the construction phase of the Proposed Development, there is a potential for release of suspended sediments entrained in surface runoff during the stripping of the topsoil and subsoil (i.e., limited excavation), the construction of the TCC and associated works and vehicle movements through the dry wheel wash and weighbridge areas, which may still mobilise fine sediments or track material towards onsite drainage ditches. The appointed contractor will ensure that any runoff from the site will be managed for the duration of the construction phase to ensure that surface water runoff is contained, attenuated and treated onsite prior to discharge to ground. However, in the absence of mitigation measures, this may result in a 'negative', 'slight to moderate' and 'temporary to short-term' impact on the quality of the drainage ditches present at the site and downstream receiving waterbodies. It is noted that this impact is considered non-significant in the context of the EIA Directive, due to its limited spatial extent, short duration, and the implementation of standard construction mitigation measures detailed in Section 7.7.1.

There will be no storage or handling of deleterious materials such as lubricants, oils, etc., and any refuelling will be controlled to minimise the potential for release to ground. There will also be a requirement for the use of the onsite generator or similar fuel containing equipment during the construction phase of the Proposed Development. In the absence of standard and appropriate construction management and mitigation measures, if the accidental release of hazardous material, including fuels and oils being used onsite, through the failure of secondary

containment or a materials handling accident were to occur over open ground, then these materials could infiltrate to the underlying groundwater and also migrate to the receiving surface water bodies. In the event of such scenarios, it is considered that this could result in 'negative', 'significant' and 'medium-term' impact on the receiving water quality of the receiving environment, depending on the nature of the incident. In the absence of mitigation and considering the potential for widespread and lasting effects on both hydrogeological and hydrological receptors, this impact is considered significant in the context of the EIA Directive. However, appropriate controls will be in place to prevent this unlikely scenario.

There is a potential risk associated with the cementitious materials used during construction works required for foundations to palisade fence posts, benching of manhole bases, mortar for setting brick risers and access covers to manholes, which has the potential to impact on the underlying groundwater at the Proposed Development. Overall, the use of cementitious material at the Proposed Development site may result in a 'negative', 'moderate to significant' and 'medium-term' impact on the receiving water environment at the Proposed Development and is considered significant in the context of the EIA Directive.

There will be no foul discharge from the site or foul water connection to the live sewers during the construction phase of the Proposed Development. Welfare facilities will comply with the Health and Safety Authority (HSA) Requirements for Construction Site Welfare Facilities (2017). Facilities will include mobile toilets and/or self-contained welfare cabins with sealed waste storage, with all sewage waste collected and tankered offsite by a licensed waste contractor in accordance with all relevant waste management legislation. It is considered that any impact relating to foul during the construction phase will be 'neutral', 'imperceptible' and 'temporary' and is considered non-significant in the context of the EIA Directive.

In the unlikely event that surplus soil is directed to an unauthorised location, there is potential to impact on the receiving hydrogeology at that location. In the event of such a scenario, it is considered that this could result in a 'negative to neutral', 'slight to moderate' and 'medium-term' impact on the hydrogeology at any receiving unauthorised locations. This impact is considered potentially significant in the context of the EIA Directive, however, appropriate controls will be in place to prevent this unlikely scenario.

7.6.2 Operational Phase

7.6.2.1 Hydrogeological Flow Regime

As per the construction phase, there will be no direct discharges to or abstractions from groundwater during the operational phase of the Proposed Development.

The final proposed infilling and recontouring levels at the site, with clean soil and stone (Article 27 compliant materials), will permanently modify the distribution of surface water runoff across the site and, therefore, will also alter the infiltration patterns at the site. The infilling material will have different properties (i.e., hydraulic conductivity) than the peat material present at the site and surrounding area, which may reduce the existing infiltration rate into the underlying aquifer, however, the regional regime of the Portlaoise GWB will not be altered due to the extent of this groundwater body and it is considered that there will be little to no change to the overall recharge potential to the aquifer beneath the site. Overall, this may result in a 'neutral', 'imperceptible to not-significant' and 'permanent' impact on the infiltration capacity of the site. It is noted that this impact is considered non-significant in the context of the EIA Directive.

7.6.2.2 Hydrological Flow Regime

As per the construction phase, there will be no direct discharges to or abstractions from surface water at the Proposed Development and diversions of water courses will not be required for the operational phase.

No new drainage infrastructure is proposed during the operational phase, as surface water runoff will be managed in accordance with the drainage infrastructure constructed during the construction phase (i.e., SuDS). The infilling and recontouring will permanently modify the existing local topography and the existing drainage patterns (i.e., direction) and the distribution of surface water runoff across the site. However, the implementation of SuDs for the Proposed Development will allow surface water to infiltrate to ground (though infiltration capacity is limited) via a soakaway, retaining surface water runoff and therefore, reducing the level of runoff discharging to the onsite ditches.

Additionally, there is no identified risk of flooding at the site, which is not located within Flood Zone A or B. Furthermore, it is considered that there will be little to no change to the overall surface water patterns and therefore, it is considered that there will be a 'negative to neutral', 'imperceptible' and 'permanent' effect on the hydrological flow regime and is considered non-significant in the context of the EIA Directive.

7.6.2.3 Groundwater Vulnerability

The groundwater vulnerability at the site is mapped by the GSI (GSI, 2026) as moderate (M). However, given that soil and subsoil have already been removed and given the presence of onsite drainage ditches that locally reduce the thickness of protective overburden, the groundwater vulnerability across the site is considered to be higher than mapped, potentially 'high' vulnerability. The operational phase of the Proposed Development will include the importation of approximately 50.250m³ (approximately 85,000 tonnes) of soil and stone and in addition, a total of 87m³ (150 tonnes) of material will be also reused onsite from the site preparation stage, which will potentially have different material properties (i.e., hydraulic conductivity) than the native cutover bog in the surrounding areas. However, this will increase the overall thickness of overburden above the underlying aquifer, thereby reducing the effective groundwater vulnerability across the site, which is expected to return to moderate or potentially low vulnerability. Therefore, there will be an overall 'positive', 'moderate' and 'permanent' impact on the groundwater vulnerability across the site reducing the potential for migration of contamination to groundwater.

7.6.2.4 Water Quality

During the construction phase of the Proposed Development, there is a potential for the release of suspended sediments entrained in surface water runoff during the infilling and recontouring at the site, with the potential to mobilise fine sediments towards drainage features, which will be upgraded and maintained as filter drains, as part of the construction phase, to maintain existing drainage flows. Surface water runoff will be contained, attenuated and treated onsite prior to discharge to ground via soakaway and there will be no discharges to any onsite ditches. However, in the absence of mitigation measures, this may result in a 'negative', 'slight to moderate' and 'temporary to short-term' impact on the quality of the drainage ditches present at the site. It is noted that this impact is considered non-significant

in the context of the EIA Directive, due to its limited spatial extent, short duration, and the implementation of standard construction mitigation measures.

The importation and infilling of the site with Article 27 soil and stone (by-product) certified as clean, inert and suitable for reuse, for restoration purposes will be subject to strict control procedures in accordance with EPA guidelines. Therefore, there will be no potential impacts on the quality of the receiving water environment associated with the importation of soils.

There will be no storage or handling of deleterious materials during the operational phase, and refuelling or fuel-powered equipment will be managed in the same controlled manner as during construction. As such, the potential impact arising from accidental releases of hazardous materials remains the same as that assessed for the construction phase. In the absence of mitigation, such an event could result in a 'negative', 'significant' and 'medium-term' impact on local groundwater or surface water quality and would be considered significant in the context of the EIA Directive. However, standard controls will be in place to prevent this unlikely scenario.

There will be no foul discharge from the site during the operational phase, as foul effluent will continue to be contained and tankered offsite in the same manner as during construction. Accordingly, the impact during the operational phase is the same as for the construction phase and is assessed as 'neutral', 'imperceptible' and 'temporary' and is considered non-significant in the context of the EIA Directive.

Once the infilling of the site is complete, the planting of the site with native grasslands will commence, therefore improving the quality of the surface water runoff through the reduction and control of siltation of any runoff from the site. It is considered that there will be 'positive', 'slight' and 'long-term' impact to the receiving surface water quality and is considered non-significant in the context of the EIA Directive.

7.6.3 Potential Cumulative Impacts

Cumulative Impacts can be defined as "impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project". Effects which are caused by the interaction of effects, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the accumulation of different effects that are individually minor. Such effects are not caused or controlled by the project developer.

As part of this assessment, other offsite developments and proposed offsite developments as detailed in Chapter 2 of this EIAR were reviewed and considered for possible cumulative effects with the Proposed Development.

7.6.3.1 Water Resources

There are no cumulative impacts associated with the construction phase and operational phase of the Proposed Development.

7.6.3.2 Water Quality

Considering the design of the surface water drainage network in accordance with the principles and objectives of SuDS to treat and attenuate water prior to discharging to ground via soakway, it is considered that there will be no cumulative impacts to the water quality and WFD status of receiving hydrogeological and hydrological receptors including the Triogue_030 river and downstream waterbodies individually or in-combination with other developments detailed in Chapter 2 of this EIAR.

7.6.4 “Do Nothing” Impact

In the ‘Do Nothing’ scenario it is considered that the Proposed Development did not proceed and the potential effect on the receiving hydrological and hydrogeological environment is considered.

In the ‘Do Nothing’ scenario, the site would remain as an undeveloped cutover bog in the immediate term and therefore, the potential positive impact on the groundwater vulnerability across the site would also not occur. Furthermore, the planting of the site with native grasslands would also not occur, and therefore, would not improve the quality of the surface water runoff through the reduction and control of siltation of any runoff from the site.

7.7 Avoidance, Remedial & Mitigation Measures

The mitigation measures outlined below will ensure that there will be no significant impact arising from the Proposed Development on the receiving groundwater and surface water environment and associated receptors (e.g., Natura 2000 sites). Therefore, the Proposed Development will not have any impact on compliance with the EU Water Framework Directive, European Communities (Environmental Objectives) Surface Water Regulations (S.I. 272 of 2009 and as amended) and the European Communities Environmental Objectives (Groundwater) Regulations (S.I. No. 9 of 2010 and as amended) individually or in combination.

7.7.1 Construction Phase

During the construction phase, all works will be undertaken in accordance with the Outline Construction Environmental Management Plan (OCEMP). Following appointment, the contractor will be required to further develop the OCEMP to provide detailed construction phasing and methods to manage and prevent any potential emissions to ground and surface water with regard to the relevant industry standards (e.g., Guidance for Consultants and Contractors, CIRIA-C532, CIRIA, 2001). The OCEMP will be implemented for the duration of the construction phase, covering construction management activities that will take place during the construction phase of the Proposed Development.

Mitigation works will be adopted as part of the construction works for the Proposed Development. These measures will address the main activities of potential impact, which include:

- Control and Management of surface water runoff.
- Control and Management of drainage ditches infill work.
- Control and Management of works adjoining drainage ditches.
- Appropriate fuel and chemical handling, transport and storage.

- Management of accidental release of contaminants at the site.
- Control and handling of cementitious materials.

The construction works will be managed in accordance with all statutory obligations and regulations and with standard international best practice. Good construction management practices will minimise the risk of pollution from construction activities at the subject site including but not limited to:

- Construction Industry Research and Information Association (CIRIA), 2001. Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors.
- CIRIA, 2015. Environmental Good Practice on Site (C741).
- Enterprise Ireland Oil Storage Guidelines (BPGCS005).
- Environmental Protection Agency (EPA), 2013. IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities.
- CIRIA, 2007. The SuDS Manual (C697).
- UK Environment Agency, 2004. UK Pollution Prevention Guidelines (PPG).
- CIRIA, 2006. Control of Water Pollution from Linear Construction Projects: Technical Guidance (C648).
- Inland Fisheries Ireland (2016). Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters.

7.7.1.1 Control and Management of Water and Surface Runoff

As documented in the HRA (DNV, 2026a; refer to Volume 3 Appendix 7.1 of the EIAR), there will be no direct discharge to groundwater or surface water during the construction phase of the Proposed Development. The following mitigation measures will be adhered to during the construction phase of the Proposed Development:

- Silt fencing will be installed prior to the commencement of construction to ensure the protection of the onsite drainage ditches. Silt fencing will also be installed around the perimeter of the site and silt traps within the drainage ditches to avoid sediment laden to migrate offsite to downgradient waterbodies.
- During the construction phase of the Proposed Development, measures would be adopted in order to prevent silt, chemicals and/or other contaminants from being washed into existing waterbodies (i.e., drainage ditches). Areas exposed due to the removal of vegetation are more susceptible to erosion during heavy rainfall, therefore, the areas would be reinstated as soon as possible to minimise this effect.
- Regular monitoring and prompt maintenance of the SuDS measures will ensure that the drainage system continues to function as designed:
 - Use of silt traps, silt fences and SuDS measures.
 - Exclusion zones between earthworks, stockpiles and temporary surfaces.
 - Temporary construction surface water drainage and sediment control measures installed prior to earthworks commencing.
 - Scheduling construction activities taking forecast weather conditions into consideration.
 - Silt ponds will be constructed on site as necessary to contain silt runoff.
 - An earth bund and silt fence will be constructed around the perimeter of the infill area. The earth bund and silt fencing will act as temporary sediment control

devices to protect receiving watercourses from sediment and potential surface water runoff from the site. The fencing will be inspected twice daily based onsite and weather conditions for any signs of contamination or excessive silt deposits and records of these checks will be maintained.

- A 10-meter buffer and silt fence will be maintained along the western drainage ditch, where no soil importation shall take place to protect surface waters and to ensure that there are no offsite nuisances created by the site.
- Stockpiles of loose materials pending reuse onsite will be protected for the duration of the works and not located in areas where sediment laden runoff may enter existing surface water drains.
 - To help shed rainwater and prevent ponding and infiltration, the sides and top of the stockpiles will be regraded to form a smooth gradient with compacted sides reducing infiltration and silt runoff.
 - Where required, silt fences will be erected at the toe of stockpiles to prevent runoff.
 - The silt fences will be monitored daily by the appointed contractor and silt will be removed as required.
 - Any materials excavated onsite during the construction works (i.e., construction phase) will be stored onsite close to the excavation location and reused where it is appropriate to do so during the operations phase. As such, offsite disposal of this material is not anticipated.
 - Low mound stockpiles will be formed from excavated material away from open drains.
- A regular review of weather forecasts of heavy rainfall will be conducted, and a contingency plan will be prepared before and after such events to minimise any potential nuisances. As the risk of the break-out of silt-laden runoff is higher during these weather conditions, no work will be carried out during such periods where possible.

7.7.1.2 Management Drainage Ditches Infill Works

The infilling of the existing drainage ditches onsite will be undertaken with cognisance to Construction Industry Research and Information Association (CIRIA), 2006. 'Control of Water Pollution from Linear Construction Projects: Technical guidance' (CIRIA C649) and 'Control of water pollution from construction sites. Guidance for consultants and contractors (C532)' and the following mitigation measures will be strictly adhered to:

- The infilling of existing drainage features including drainage ditches and bog drains will be completed in accordance with Series 600 of the TII Specification for Road Works and the recommendations contained within the "NRA Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes".
- The existing drainage features (i.e., charted bog/field drains) will be cleared of vegetation and filled with clean washed CL6A material to TII specification. They will be maintained and upgraded to filter drains to maintain existing drainage flows.
- Before vegetation clearance commences, drainage runoff controls such as silt traps should be installed at the point where the site boundary intercepts any onsite drainage ditch along the northern or southern boundary. This should remain in-place for the duration of the construction phase.

- The installation of a 450mm diameter perforated pipe and permeable surround within the infill area will be applicable to all surface water drains onsite.
- All material placed into drainage features will be deposited by end tipping without compaction.
- The water will be allowed to flow through the existing drainage features at right angles in either direction.
- Runoff from the areas of exposed soil will be intercepted by a silt containment barrier (i.e., silt fence) installed in advance of the drainage ditch.
- Any machines working in the vicinity of the open waterbodies will be protected against leakage or spillage of fuels, oils, greases and hydraulic fuels.
- Any displaced water during the infilling of the open waterbodies will be allowed to infiltrate to ground in the immediate surrounding area. Where required, drainage runoff controls such as silt fences and silt traps will be provided.
- All trucks leaving the site will pass through a dry wheel wash, thereby removing the potential for transport of sediment offsite. The wheel wash will be periodically cleaned out and its contents will be disposed of in the appropriate manner by a suitably licensed waste contractor and never discharged onsite.

7.7.1.3 Control and Management of Works Adjoining Drainage Ditches

Silt fencing or bunding along the length of the drainage ditches will be erected following the clearance of the site (i.e., vegetation clearance), which will take cognisance of Inland Fisheries Ireland (IFI) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters (IFI, 2016). The silt fencing will act in filtering any potential surface water runoff from the site generated during the proposed works and will be retained in place for the duration of the construction phase until the development is complete. The project specific CEMP (which will be finalised by the main contractor in advance of construction works commencing) will identify how this silt curtain is to be installed and maintained throughout the construction phase.

- The silt fences will be monitored to ensure that they remain functional throughout the construction of the Proposed Development (and throughout the operational phase).
- Where necessary, maintenance will be carried out on the fences to ensure that they continue to be effective. This will be particularly important after heavy rainfall events.
- The checks will be undertaken by the Environmental Manager.
- The frequency of monitoring will depend on the stage of works, and local environmental conditions.
- Daily checks may be appropriate during the initial site clearance, during works in the vicinity of the drainage ditches and during and after storm events.
- Weekly or bi-weekly checks may be appropriate at other times (i.e., during the operational phase).

All works carried out in or adjacent to the drainage ditches will adhere to the Inland Fisheries Ireland (IFI) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters (IFI, 2016), the Transport Infrastructure Ireland (TII) Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (TII, 2008) and CIRIA C648 Control of Water Pollution from Linear Construction Projects (CIRIA, 2006).

All near stream works will include the following measures:

- Entry to the drainage ditches by vehicles will not be permitted, while vehicle usage along the banks will be restricted as much as practicable. Any machines working in close proximity of the watercourse must be protected against leakage or spillage of fuels, oils, greases and hydraulic fuels.
- Silt fences and other sediment control measures will be utilised as required to prevent sedimentation in the drainage ditches.

7.7.1.4 Handling of Fuels, Chemicals and Materials

Fuelling and lubrication of equipment will be carried out in accordance with the procedures outlined in the OCEMP (Lenztech, 2023), in a designated area of the site (i.e., bunded areas), away from any watercourses and drains (where not possible to carry out such activities offsite) with full attendance of plant operatives.

Fuel will be stored onsite for the duration of the Proposed Development within the site compound in secure, fit for purpose containers within bunded containment as appropriate and in accordance CIRIA guidance documents as documented in the OCEMP (Lenztech, 2023). Fuel will only be brought to site via mobile fuel bowser. Any other oils or hydraulic oils stored onsite will be stored in designated areas in suitable tanks and containers. These areas will be bunded and located away from surface water features.

Spillage of fuel, oil and chemicals will be minimised by implementation of an Emergency Pollution Prevention Plan (EPPP), which would be prepared by the contractor as part of the project-specific CEMP. In the event of any spillage or pollution of any watercourse, the emergency spill procedures as described in the EPPP would be implemented immediately.

- Generally, refuelling of mobile plant and machinery will be carried out at a designated location within the site compound only at a dedicated impermeable refuelling pad or by mobile double-bunded bowzers at their place of work. The refuelling pad would be bunded and equipped with a collection sump. Refuelling will be carried out using an approved mobile fuel bowser with a suitable pump and hose.
- All other fuels, oils and potential contaminants, as well as waste oils, will be stored within the site compound in secure, fit for purpose containers within bunded containment as appropriate and in accordance CIRIA guidance documents (Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors-2001, Environmental Good Practice on Site-C650), EPA “IPC Guidance Note on Storage and transfer of Materials for Scheduled Activities” and with SEPA guidance (GPP 2: Above ground oil storage tanks, January 2018).
- Bunds will have regard to the Environmental Protection Agency guidelines ‘Amendment to IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities’ (EPA, 2013). All tank and drum storage areas will, as a minimum, be bunded to a volume not less than the greater of the following:
 - 110% of the capacity of the largest tank or drum within the bunded area; or
 - 25% of the total volume of substance that could be stored within the bunded area.
- Strict supervision of contractors will be adhered to in order to ensure that all plant and equipment utilised onsite is in good working condition.
- Any equipment not meeting the required standard will not be permitted for use within the Proposed Development site.

- Only emergency breakdown maintenance will be carried out onsite.
- Drip trays and spill kits will be available onsite to ensure that any spills from vehicles are contained and removed offsite.
- Spill kits will be made available and kept onsite at all times and identified with signage for use in the event of an environmental spill or leak.
- Method statements for dealing with accidental spillages will be provided to the Contractor for review by the Employer's Representative.

There may also be the requirement for use of onsite generators or similar fuel containing equipment during the construction phase of the Proposed Development, which will be placed on suitable drip trays. Regular monitoring of drip tray content will be undertaken to ensure sufficient capacity is maintained at all times.

7.7.1.5 Emergency Procedures

Emergency procedures will be developed by the appointed contractor in advance of works commencing. Remedial action will be immediately implemented to address any potential impacts in accordance with industry standards and legislative requirements. The following mitigation measures will be adhered to as follows:

- Emergency response procedures and contingency plans will be put in place, in the unlikely event of emergency accidents (i.e., spillages of fuels or lubricants).
- Spill kits, including oil absorbent material, will be provided and available onsite, so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained.
- In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the Proposed Development site and compliantly disposed of offsite. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures, standards and EPA guidelines.
- All construction works staff will be familiar with the emergency procedures in the event of accidental fuel spillages.
- All construction works staff onsite will be fully trained on the use of equipment.

7.7.1.6 Concrete Works

The use of cementitious material employed during the construction phase of the Proposed Development will avoid any contamination of the receiving hydrogeological environment through the use of appropriate design and methods implemented by the appointed contractor and in accordance with the OCEMP (Lenztech, 2023), and relevant industry standards to prevent impact on groundwater and surface water quality such as the use of water compatible grout.

The following are mitigation measures that need to be adhered to when using concrete for the Proposed Development:

- Concrete batching will take place offsite.
- Wash down and wash out of concrete trucks will take place into a container located within a controlled bunded area which will then be emptied into a skip for appropriate

compliant removal offsite in accordance with all relevant waste management legislation.

- Any excess concrete is not to be disposed of onsite.
- Pouring of cement-based materials for works will only be carried out in dry conditions and pumped concrete will be monitored to ensure there is no accidental discharge.
- A suitable risk assessment for wet concreting shall be completed prior to works being carried out. Pumped concrete will be monitored to ensure there is no accidental discharge.
- Pouring of concrete will not be permitted within 50m of any watercourse during inclement weather.

7.7.1.7 Welfare Facilities

Welfare facilities will be provided for the full duration of the Proposed Development. Temporary welfare facilities (i.e., temporary portaloo and an onsite welfare facility cabin with self-contained toilet and washing facilities) have the potential, if not managed appropriately, to release organic and other contaminants to ground or watercourses.

The following mitigation measures will be adhered to during the construction phase of the Proposed Development as follows:

- Effluent and waste from temporary onsite welfare facilities would be maintained, collected and disposed (i.e., tankered offsite) by an approved licenced waste contractor.
- All waste will be managed in accordance with the relevant statutory obligations and with relevant waste management legislation.
- Welfare facilities will comply with the Health and Safety Authority (HSA) Requirements for Construction Site Welfare Facilities (2017).

7.7.2 Operational Phase

Only clean inert soil and stone from greenfield development sites will be imported under Article 27 to the site for the infilling and recontouring phase.

The mitigation measures outlined for the construction phase will continue to apply, where relevant, during the operational phase of the Proposed Development. These measures will ensure the ongoing protection of surface water, groundwater and cutover bog hydrology. In addition to the construction phase controls that remain applicable, a small number of operational specific mitigation measures will also be implemented and will address the main activities of potential impact, as outlined below:

- Management and control of imported soil and aggregates from offsite sources.
- Management and control during the recontouring works.

7.7.2.1 Importation of Soil and Stone

The following mitigation measures will be adhered to during the operational phase of the Proposed Development as follows:

- All materials imported to the site for recovery will be inspected on delivery and prior to unloading / placement on the site.

- All soil and stone imported to the site for infilling and recontouring purposes shall be monitored in accordance with the requirements of Article 27 of the European Communities (Waste Directive) Regulations 2011 and the EPA Guidance on Soil and Stone By-Products (EPA, 2019). This will ensure that only clean, inert materials, free from contamination, invasive species and other anthropogenic inclusions, are accepted for use at the site, thereby preventing the introduction of potential contaminant sources.
- Any unsuitable materials will be removed from the site in accordance with all legislative requirements.
- Where applicable, the removal of surplus materials arising during the construction phase of the Proposed Development will be managed in accordance with the by-product provisions of Article 27 of the European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011), as amended. A by-product assessment shall be undertaken to demonstrate that any such surplus material satisfies all four conditions set out in Article 27 prior to its removal from the site. Where applicable, this will be addressed either by way of a project-specific Article 27 notification to the Environmental Protection Agency (EPA) or by confirming that the material falls within the scope of a valid Article 27 registration held with the EPA. In accordance with EPA guidance, surplus material shall not be removed from the site until the Article 27 assessment has been completed and the material is confirmed to be covered by the relevant notification or registration.
- All loads of imported soil and stone shall be subject to visual inspection on arrival at the site and prior to placement, to confirm the absence of contamination, invasive species, staining, odours or anthropogenic inclusions.
- Where soil and stone are proposed to be imported from non-greenfield or previously developed sources, additional supporting information may be required to demonstrate geochemical suitability. This may include soil analytical data and/or a source-specific risk assessment, as appropriate, in accordance with EPA (2019) guidance.
- Any material received from an unapproved or unverified source, or which fails to meet the Article 27 acceptance criteria, shall be rejected and shall not be incorporated into the infill.

7.7.2.2 Recontouring

The recontouring (i.e., restoration) of the site will take into consideration the surrounding landscape, the local groundwater flow regime and proposed use of the lands for agriculture which will be undertaken in accordance with the requirements of applicable EPA restoration guidelines. Where required, the appropriate drainage layers will be incorporated into the soil cover to minimise potential issues for slope stability associated with pore water.

Accordingly, any potential impact on receiving surface water and groundwater beneath the Proposed Development will be avoided taking account of the design and mitigation proposals. Therefore, it is considered that the water quality protection criteria and objectives of the SuDs and Water Framework Directive will be achieved.

There is no other requirement for mitigation measures for the operational phase of the Proposed Development.

7.8 Water Framework Directive

The EU Water Framework Directive (2000/60/EC), as amended by Directives 2008/105/EC, 2013/39/EU, and 2014/101/EU (“WFD”), was established to ensure the protection and enhancement of the water environment across all EU member states. In Ireland, the WFD has been transposed through the European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003).

The WFD requires that all member states protect and improve water quality in all waters, with the objective of achieving at least ‘good’ status by 2027. It applies to all surface waters (including rivers, lakes, reservoirs, streams, and canals), groundwater, transitional (estuarine), and coastal waters. Any new development must ensure that this objective is not compromised.

A risk-based assessment was undertaken to evaluate the potential impact of the Proposed Development on water quality within the surrounding hydrological environment. This assessment considered both the baseline conditions and the relevant legislative framework, including the WFD and associated national regulations.

7.8.1 Waterbody Status

The risk-based assessment focused on the following waterbodies that have a potential hydraulic connection to the site:

- Portlaoise GWB.
- Triogue_030 River and closest associated rivers/streams potentially hydraulically connected to this river (i.e., Triogue_040 and Barrow_050).

There is no identified potential impact to any tidally linked transitional and coastal waterbodies attributed to the anticipated assimilation capacity of the receiving water bodies taking account of the existing baseline conditions and WFD Status and the separation distances to the site.

7.8.2 Assessment

The findings of the risk-based assessment identified that in the absence of any mitigation and avoidance measures there could be a potential effect on the water quality (WFD Status) within receiving water bodies associated with the Proposed Development, specifically within the Portlaoise GWB, Triogue_030 River and closest associated rivers/streams potentially hydraulically connected to this river (i.e., Triogue_040 and Barrow_050). The potential impact on WFD status for water bodies was assessed based on the worst-case scenario, taking account of the baseline hydrological and hydrogeological conditions at the subject site and the WFD status assigned by the EPA (EPA, 2026).

To address potential risks, the Proposed Development incorporates design avoidance and mitigation measures as outlined in this chapter of the EIAR, including the implementation of a project-specific CEMP during the construction and operational phase and the incorporation of SuDS in the Proposed Development. These measures will serve to mitigate any potential impact on the receiving groundwater and surface water environment. Hence, the Proposed Development will not have any effect on compliance with the EU Water Framework Directive

7.8.3 Conclusion

Taking into account the embedded design and mitigation measures, the Proposed Development:

- Will not result in deterioration of the status of hydrologically and hydrogeologically connected waterbodies.
- Will not compromise the objective of achieving 'good' surface water status or good ecological potential.
- Will remain compliant with the WFD and relevant national legislation.

There will be no adverse effect on the existing WFD status of hydraulically connected waterbodies associated with the Proposed Development including Triogue_030 River and closest associated rivers/streams potentially hydraulically connected to this river (i.e., Triogue_040 and Barrow_050) and the Portlaoise GWB.

Overall, there will be a 'neutral to positive', 'slight to moderate' and 'long-term' impact on the WFD Status and is considered non-significant in the context of the EIA Directive.

7.8.4 "Worst Case" Scenario

During the construction and operational phase, there is a potential risk of accidental release of petroleum hydrocarbons (e.g., fuel spill) that could migrate to groundwater or surface water and impact on the quality of the receiving water body and downstream receptors, depending on the nature of the incident. In the absence of any mitigation measures and worst-case scenario, it is considered that there would be a potential 'negative', 'significant', 'medium-term' impact on the quality of a localised area of the aquifer and on the receiving waterbodies.

In addition, in a worst-case scenario such as the failure or overtopping of SuDS features during extreme rainfall events, there is a potential for limited overland flow to bypass the SuDS network and enter onsite drainage ditches, with potential subsequent migration to downstream surface water receptors. However, the design and operation of the SuDS measures, together with the 10-metre buffer zone and silt fencing along the western boundary ditch and any other drainage ditches identified at the site, are intended to intercept, attenuate and infiltrate runoff onsite. These measures will significantly reduce the potential for offsite migration of suspended solids, thereby limiting the risk of adverse effects on downstream surface waterbodies.

However, these worst-case scenarios are deemed to be unlikely scenarios taking account of the embedded design avoidance measures and mitigation measures and therefore, there would be a 'neutral', 'imperceptible' and 'short-term' impact on the receiving environment.

7.9 Residual Impacts

Residual Impacts are defined as 'effects that are predicted to remain after all assessments and mitigation measures. They are the remaining 'environmental costs' of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts.

The predicted impacts of the construction and operational phases are described in Table 7-8 in terms of quality, significance, extent, likelihood, and duration. The relevant mitigation

measures are detailed, and the residual impacts are determined which take account of the avoidance, remedial and mitigation measures.

Overall, considering the avoidance, remedial and mitigation measures detailed in Section 7.7, the residual effects regarding the construction and operational phases of the Proposed Development are considered 'imperceptible' to the receiving water environment (hydrology and hydrogeology) and considered non-significant in the context of the EIA Directive.

There will be no impact to the existing WFD Status of waterbodies associated with the Proposed Development including the Triogue_030 River and closest associated rivers/streams potentially hydraulically connected to this river (i.e., Triogue_040 and Barrow_050) and the Portlaoise GWB as a result of the Proposed Development taking account of design avoidance and mitigation measures where required.

Table 7-8. Summary of Residual Impacts

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
Construction Phase								
Introduction of Cementitious Materials to Groundwater	Groundwater Quality / WFD Status	Potential release of cementitious material during construction works for foundations to palisade fence post, benching of manhole bases, mortar for setting brick risers and access covers to manholes.	Negative	Moderate to Significant	Medium-Term	Direct	All work will be carried out to avoid any contamination of the receiving water environment through the use of appropriate design and methods implemented by the appointed Contractor and in accordance with the project specific CEMP and relevant industry standards.	Imperceptible
Removal of Surplus Materials	Groundwater Quality and WFD status at the destination site.	In the unlikely event that surplus soil or other waste materials are directed to an unauthorised location, there is potential to impact on the receiving hydrogeology at that location.	Negative to Neutral	Slight to Moderate	Medium Term	Direct	In the case that surplus materials require removal offsite, it will be managed in accordance with all statutory obligations and appropriate controls.	Imperceptible
Surface Runoff Containing Contaminants or Suspended Solids.	Surface Water Quality / WFD Status	Potential for contaminants entrained in surface runoff during the infilling and recontouring to enter the receiving drainage ditches at the site	Negative	Slight to Moderate	Short-term	Direct / Indirect	Site works will be managed to prevent runoff migrating offsite. Dry wheel wash facilities will be used to prevent tracking of debris to haul routes that may runoff to water courses.	Imperceptible

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
Foul Discharge	Water quality / WFD Status	Potential impact from foul drainage from the welfare facilities onsite	Neutral	Imperceptible	Temporary	Direct	Welfare facilities will comply with the HSA Requirements for Construction Site Welfare Facilities (2017). There will be no discharges or connection to live sewers from the Proposed Development, with all sewage waste collected and tankered offsite by a licensed waste contractor.	Imperceptible
Accidental release of deleterious materials, including fuel and other materials being used onsite.	Groundwater and Receiving Surface Water Quality / WFD Status	Potential for impact on the Portlaoise GWB within a localised zone of the aquifer and on the receiving waterbodies	Negative	Significant	Medium-Term	Direct / Worst Case	There will be no storage of deleterious materials and refuelling of plant will be undertaken in accordance with best practice procedures and the measure outline in the OCEMP that will be developed for the Proposed Development. Appropriate mitigation measures to prevent the worst-case scenario from occurring will be implemented during the construction phase.	Imperceptible
Operational Phase								
Infilling of the site	Hydrogeological Regime	Potential for altering existing infiltration patterns due to infilling of the site with clean soil and stone.	Neutral	Imperceptible to not-significant	Permanent	Direct	The restoration of the site will take account of the local groundwater flow and infiltration regime and will be in accordance with the	Imperceptible

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
							requirements of applicable restoration guidelines.	
Infilling of the site	Hydrological Regime / Flood Risk	Potential for altering existing surface water drainage patterns due to infilling of the site with clean soil and stone.	Negative to Neutral	Imperceptible	Permanent	Direct	The restoration of the site will take account of the local surface water flow patterns and will be in accordance with the requirements of applicable restoration guidelines. The design of the Proposed Development is that the land will be restored and planted with native grassland, thereby reducing surface runoff potential.	Imperceptible
Infilling of the site	Groundwater Vulnerability	Infilling of the site with soil and stone that has different material properties (i.e., hydraulic conductivity) and infiltration rate than the native cutover bog will increase the overall thickness of overburden above the aquifer, thereby reducing the groundwater vulnerability and increasing the overall protection across the site.	Positive	Moderate	Permanent	Direct	None Required	Positive
Surface Runoff Containing Contaminants	Surface Water Quality / WFD Status	Potential for contaminants entrained in surface runoff during the infilling and recontouring to enter the	Negative	Slight to Moderate	Short-term	Direct / Indirect	Site works will be managed to prevent runoff migrating offsite. Dry wheel wash facilities will be used to prevent tracking of debris	Imperceptible

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
or Suspended Solids.		receiving drainage ditches at the site.					to haul routes that may runoff to water courses	
Foul Discharge	Water quality / WFD Status	Potential impact from foul drainage from the welfare facilities onsite.	Neutral	Imperceptible	Temporary	Direct	Welfare facilities will comply with the HSA Requirements for Construction Site Welfare Facilities (2017). There will be no discharges or connection to live sewers from the Proposed Development, with all sewage waste collected and tankered offsite by a licensed waste contractor	Imperceptible
Removal of Surplus Materials .	Groundwater Quality and WFD status at the destination site.	In the unlikely event that surplus soil .are directed to an unauthorised location, there is potential to impact on the receiving hydrogeology at that location.	Negative to Neutral	Slight to Moderate	Medium Term	Direct	All surplus materials that will require removal offsite will be managed in accordance with all statutory obligations including, where appropriate, reuse as by-product in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011 (SI No. 126 of 2011) as amended (referred to hereafter as Article 27).	Imperceptible
Accidental release of deleterious materials, including fuel and other	Groundwater and Receiving Surface Water Quality / WFD Status	Potential for impact on the Portlaoise GWB within a localised zone of the aquifer and on the receiving waterbodies.	Negative	Significant	Medium-Term	Direct / Worst Case	There will be no storage of deleterious materials and refuelling of plant will be undertaken in accordance with best practice procedures and the	Imperceptible

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
materials being used onsite							measure outline in the OCEMP that will be developed for the Proposed Development. Emergency response procedures will be put in place, in the unlikely event of spillages of fuels or lubricants.	
Recontouring of the site	Water quality	The planting of the site with native grassland will have a positive impact on the quality of surface water runoff through the reduction and control of siltation of any runoff from the site.	Positive	Slight	Long-Term	Direct	None Required.	Positive

7.10 Monitoring

7.10.1 Construction Phase

During the construction phase of the Proposed Development the following monitoring measures will be considered:

- The location of all drainage features will be identified and surveyed prior to commencement for record and maintenance purposes.
- An Ecological Clerk of Works (ECoW) will be appointed to ensure best practices are adhered to and that recommendations outlined in the OCEMP are effectively implemented.
- Inspections will be undertaken during the limited excavations and other groundworks to ensure that measures that are protective of water quality outlined in this EIAR and the OCEMP are fully implemented and effective.
- All surface water control measures, including silt traps, silt fences, etc., will be checked regularly and maintained as necessary, in order to ensure continued effectiveness throughout the construction phase.
- Ongoing regular operational monitoring and maintenance of drainage and the SuDS measures will be undertaken throughout the construction phase of the Proposed Development.
- Visual inspection of the drainage ditches present at the site will be undertaken daily to ensure no sediment/pollutant deposits are evident.
- Ongoing regular operational monitoring and maintenance of drainage and the SuDS measures will be undertaken during the construction phase of the Proposed Development.
- Visual daily inspection of the drainage ditches during the infilling of the ditches with clean washed Clause 6A material to ensure there are no fines or dust particles entrained in the filling material.
- Routine monitoring and inspections during refuelling, concrete works to ensure no impacts and compliance with avoidance, remedial and mitigation measures.

7.10.2 Operational Phase

During the operational phase of the Proposed Development, the following monitoring measures will be considered:

- Ongoing regular operational monitoring and maintenance of drainage and the SuDS measures will be undertaken throughout the operational phase of the Proposed Development until the decommissioning works (Phase 4).
- All soil and stone imported to the site for infilling and recontouring purposes shall be monitored in accordance with the requirements of Article 27 of the European Communities (Waste Directive) Regulations 2011 and the EPA Guidance on Soil and Stone By-Products (EPA, 2019). This will ensure that only clean, inert materials, free from contamination, invasive species and other anthropogenic inclusions, are accepted for use at the site, thereby preventing the introduction of potential contaminant sources.

- Priority shall be given to greenfield soil and stone sources, defined as material derived from previously undeveloped lands. Each greenfield source shall be supported by:
 - Confirmation of greenfield status.
 - Article 27 registration and/or notification.
 - A Material Producer's Declaration and associated Statement of Conformity confirming that the material qualifies as a by-product under Article 27 and is suitable for use at the receiving site.
 - Source information will be reviewed and approved prior to the importation of material to the site.
- All loads of imported soil and stone shall be subject to visual inspection on arrival at the site and prior to placement, to confirm the absence of contamination, invasive species, staining, odours or anthropogenic inclusions.
- Where soil and stone are proposed to be imported from non-greenfield or previously developed sources, additional supporting information may be required to demonstrate geochemical suitability. This may include soil analytical data and/or a source-specific risk assessment, as appropriate, in accordance with EPA (2019) guidance.
- Any material received from an unapproved or unverified source, or which fails to meet the Article 27 acceptance criteria, shall be rejected and shall not be incorporated into the infill.

7.11 Interactions

7.11.1 Population and Human Health

An assessment of the potential impact of the Proposed Development on human health is included in Chapter 4 of this EIAR.

Pollution events can impact the water quality and thus impact the human health of the surrounding population. Appropriate surface water control measures will be implemented as part of the Proposed Development.

Appropriate industry standard and health and safety legislative requirements will be implemented during the construction phase and operational phase of the Proposed Development, that will be protective of site workers.

7.11.2 Land, Soil and Geology

An assessment of the potential impact of the Proposed Development on the land and soils is included in Chapter 6 of this EIAR. During the construction and operational phase of the Proposed Development, the importation of the fill material (i.e., clean inert soil and stone) can impact the structure and quality of the existing soils at the site. However, appropriate mitigation controls under Article 27 regulations will be implemented during the construction phase and operational phase of the Proposed Development, which will be protective of the soil and geology.

7.11.3 Biodiversity

An assessment of the potential impacts of the Proposed Development on the Biodiversity of the site, with emphasis on habitats, flora and fauna which may be impacted during the

construction phase and infilling is included in Chapter 5 of this EIAR. It also provides an assessment of the impacts of the Proposed Development on habitats and species, particularly those protected by national and international legislation or considered to be of particular conservation importance and proposes measures for the mitigation of these impacts.

7.11.4 Air Quality and Climate

The filling of the drainage ditches, infilling of the site with clean soil and stone and recontouring at the site have the potential to generate nuisance effects (i.e., dust) during the construction and operational phase of the Proposed Development.

An assessment of the potential effect of the Proposed Development on air quality is included in Chapter 8 of this EIAR.

7.11.5 Landscape and Visual

During the construction phase and into the operational phase of the Proposed Development, the site landscape will undergo a change from cutover bog to recontoured agricultural lands.

An assessment of the potential effect of the Proposed Development on the receiving landscape is included in Chapter 11 of this EIAR.

7.11.6 Material Assets: Waste, Traffic and Transport

The Proposed Development will include the filling of the drainage ditches and infilling of the site, with subsequent recontouring of the site. An assessment of the potential effect of the Proposed Development on the material assets (traffic and transport and waste management) during the construction and operations phase of the Proposed Development is included in Chapter 13 and Chapter 14 of this EIAR, respectively.

7.12 Difficulties Encountered When Compiling

There were no difficulties were encountered in the preparation of this chapter of the EIAR.

7.12.1 Conclusion

Overall, taking into account the avoidance, remedial, and mitigation measures outlined in Section 7.7, the residual effects associated with both the construction and operational phases of the Proposed Development are considered imperceptible in terms of their impact on the receiving environment (hydrogeology). These effects are deemed non-significant within the context of the EIA Directive. Furthermore, no hydrological and hydrogeological-related constraints have been identified that would be expected to hinder or prevent the Proposed Development from proceeding as planned.

There will be no effect to water quality and the existing WFD Status of water bodies associated with the Proposed Development including the Portlaoise GWB, Triogue_030 River and closest associated rivers/streams potentially hydraulically connected to this river (i.e., Triogue_040 and Barrow_050) taking account of embedded design avoidance and mitigation measures where required.

7.13 References

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8 AIR QUALITY

8.1 Introduction

This chapter describes and assesses the potential effects on air quality associated with the Proposed Development.

8.1.1 Quality Assurance and Competence

This chapter was prepared by Darragh Grant, Environmental Consultant with DNV. Darragh is an Environmental Impact Assessment (EIA) practitioner with a bachelor's degree in Zoology (University College Dublin) and a master's degree in Environmental & Climate Law (University College Dublin). Darragh has experience preparing EIA Screening Reports, Material Assets (Waste and Utilities), Interactions and Mitigation & Monitoring chapters of Environmental Impact Assessment Reports (EIARs).

This chapter was reviewed by Mairéad Foran, Senior Environmental Consultant with DNV. Mairéad has a B.A. (Moderatorship) in Environmental Sciences from Trinity College Dublin, and an Advanced Diploma in Planning and Environmental Law from King's Inns College, Dublin. Mairéad has over 7 years professional experience as an Environmental Consultant, with experience working on a large number of EIARs and EIA Screening Reports for projects of a similar nature and scale to that of the Proposed Development.

This chapter has been approved by Catherine Keogan, Technical Director and EIA Lead at DNV. Catherine is an environmental consultant with 37 years' experience in consultancy, specialising in EIAs for large-scale residential, commercial developments, pharmaceutical, BESS and solar projects working closely with a range of developers, planning consultants and architects within the public and private sector. Catherine has a B.Sc. (Hons) in Analytical Science and a Post Graduate Diploma in Renewable Energy Technology Systems.

8.2 Study Methodology

The study methodology adopted for this assessment is in line with accepted industry practices and relevant regulatory guidance. In accordance with the Ambient Air Quality Standards Regulations 2022 (S.I. No. 739/2022), the baseline air quality of the site and surrounding area has been characterised using publicly available EPA monitoring data.

A desktop study was undertaken, including analysis of synoptic meteorological data from the nearest Met Éireann station Mullingar, to understand prevailing weather conditions that influence dust dispersion and deposition.

The assessment follows the Institute of Air Quality Management (IAQM) 2016 Guidance on the Assessment of Mineral Dust Impacts for Planning, which provides a structured, qualitative framework for evaluating dust impacts from mineral activities.

Air quality impacts have been determined through a qualitative risk-based assessment of fugitive dust emissions associated with the Proposed Development. The assessment sets out to:

- Assess existing PM₁₀ concentrations and dust deposition rates in the vicinity of the site;
- Identify the potential sources of dust emissions from infilling activities;

- Identify local sensitive receptors, including residential properties, ecological sites, and public amenities;
- Evaluate the pathway and separation distance between dust sources and sensitive receptors; and
- Analysis of weather data to assess impacts caused by weather events.

In addition to assessing the effect on people as a result of air quality, the effects on sensitive ecosystems must also be assessed as per the Transport Infrastructure Ireland (TII) guidelines (TII, 2022; 2025).

The EC Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the '*Habitats Directive*') requires an Appropriate Assessment to be carried out where there is likely to be a significant effect upon a European protected site.

The TII Air Quality Guidance require the Air Quality Specialist to liaise with an ecologist on schemes where there is a European protected site or a nationally designated site within 2km of the site.

The following nationally designated sites are within 2km of the Proposed Development:

- Clonreher Bog Natural Heritage Area (NHA) (002357); and
- Ridge of Portlaoise Proposed Natural Heritage Area (pNHA) (000876).

This study involved coordination with the ecologist preparing the Biodiversity Chapter and should be read in conjunction with the Population and Human Health, Land and Soils, Biodiversity, Climate and Traffic Chapters of this EIAR, as well as the Appropriate Assessment (AA) Screening (Roger Goodwille & Associates, 2023) where potential impacts to the nearest Natura 2000 sites and nationally designated sites are further assessed.

8.2.1 Relevant Legislation and Guidance

The principal guidance and best practice documents used to inform the assessment of potential impacts on air quality are as follows:

- A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (Version 1.1) (IAQM, 2020);
- Ambient Air Quality Standards Regulations 2022 (S.I. No 739/2022);
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);
- Environmental Management in the Extractive Industry (EPA, 2006);
- European Union (Environmental Impact Assessment) Regulations 2020 (S.I. No. 191/2020);
- Guidelines on the Assessment of Mineral Dust Impacts for Planning (IAQM, 2016);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government (DHPLG), 2018);

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the Environmental Protection Agency (EPA) Guidelines) (EPA, 2022);
- Guidance on the Assessment of Dust from Demolition and Construction Version 2.2 (Institute of Air Quality Management (IAQM), 2024);
- TII Guidance Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106 (TII, 2025) and TII Road Emissions Model (REM) online calculator tool (TII, 2026); and
- TII Road Emissions Model (REM): Model Development Report – GE-ENV-01107 (TII, 2022).

8.2.1.1 Ambient Air Quality Standards

In order to reduce the risk to human health from poor air quality, National and European statutory bodies, including the Department of the Environment, Heritage and Local Government in Ireland (DEHLG, 2004) and the European Parliament and Council of the European Union, have set limit values in ambient air for a range of air pollutants. These limit values or ‘Air Quality Standards’ are health- or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set.

Air quality significance criteria are assessed based on compliance with the appropriate standards or limit values. The applicable standards in Ireland include the Air Quality Standards Regulations 2022, which incorporate European Commission Directive 2008/50/EC, which has set limit values for numerous pollutants with the limit values for nitrogen dioxide (NO₂), particulate matter less than 10 microns (PM₁₀), and particulate matter less than 2.5 microns (PM_{2.5}) are considered the most relevant to this assessment due to their association with traffic and dust generating activities.

Other pollutants regulated under Directive 2008/50/EC including sulphur dioxide (SO₂), carbon monoxide (CO), and benzene, are acknowledged for completeness but are not considered significant in the context of this infill.

Council Directive 2008/50/EC combines the previous Air Quality Framework Directive (96/62/EC) and its subsequent daughter directives (including 1999/30/EC and 2000/69/EC) and includes ambient limit values relating to PM_{2.5}. In addition, Ireland is a signatory to the Gothenburg Protocol under the United Economic Commission for Europe (UNECE) Convention on Long-Range Transboundary Air Pollution (LRTAP). The Protocol sets national emission reduction commitments for key pollutants including SO₂, nitrogen oxides (NO_x), volatile organic compounds (VOCs), ammonia (NH₃) and PM_{2.5}. While it does not establish ambient air quality standards, it supports national and EU-level efforts to reduce transboundary air pollution and informs Ireland’s air quality and emissions policy framework.

These pollutants are not considered further in this chapter, as they are not expected to be significantly influenced by the Proposed Development.

The applicable limit values for NO₂, PM₁₀, and PM_{2.5}, SO₂, CO and benzene are set out in Table 8-1.

Table 8-1 Ambient Air Quality Standards and TA Luft

Pollutant	Regulation ¹	Limit Type	Value
Dust Deposition	TA Luft (German VDI, 2002)	Annual average limit for nuisance dust	350 mg/m ² /day
Nitrogen Dioxide	2008/50/EC	Hourly limit for protection of human health – not to be exceeded more than 18 times/year	200 µg/m ³
		Annual limit for protection of human health	40 µg/m ³
NOx	2008/50/EC	Annual limit for the protection of vegetation	30 µg/m ³
Particulate Matter (as PM ₁₀)	2008/50/EC	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 µg/m ³ PM ₁₀
		Annual limit for protection of human health	40 µg/m ³ PM ₁₀
Particulate Matter (as PM _{2.5}) – Stage 1	2008/50/EC	Annual limit for protection of human health	25 µg/m ³ PM _{2.5}
Particulate Matter (as PM _{2.5}) – Stage 2 ²	2008/50/EC	Annual limit for protection of human health	20 µg/m ³ PM _{2.5}
Sulphur Dioxide (SO ₂)	2008/50/EC	Hourly limit for the protection of human health (not to be exceeded >24 times/year)	350 µg/m ³
		Daily limit for protection of human health (not to be exceeded >3 times/year)	125 µg/m ³
Carbon Monoxide (CO)	2008/50/EC	Maximum daily 8-hour mean	10 mg/m ³
Benzene	2008/50/EC	Annual limit for protection of human health	5 µg/m ³

On the 14th of October 2024 the European Parliament and the Council of the European Union adopted a directive setting updated air quality standards across the EU. The directive aims to improve air quality across the EU by aligning standards with the latest World Health Organisation (WHO) guidelines and reducing air pollution's health impacts by more than 55% by 2030. The directive updates and consolidates previous directives (2004/107/EC and 2008/50/EC) to enhance clarity and effectiveness. This plan is part of the broader European Green Deal and Zero Pollution Action Plan, targeting significant reductions in air, water, and soil pollution by 2050. The revised directive will also ensure early action, with air quality roadmaps that need to be prepared ahead of 2030 if there is a risk that the new standards will

¹ EU 2008/50/EC – Clean Air For Europe (CAFÉ) Directive replaces the previous Air Framework Directive (1996/30/EC) and daughter directives 1999/30/EC and 2000/69/EC

² Stage 2 Indicative limit value for PM_{2.5} to be applied from 1 January 2020 after review by the European Commission

not be attained by that date. The air quality standards will be reviewed regularly in line with latest scientific evidence to assess whether they continue to be appropriate.

Directive (EU) 2024/2881 was published in the EU's Official Journal and entered into force on the 10th of December 2024. Member States have until the 10th of December 2026 to transpose the directive into national law. Ireland is required to meet this deadline; however, at the time of writing, a national transposition date has not yet been confirmed.

By 2030, the European Commission will review the air quality standards, and every five years thereafter, in line with latest scientific evidence.

At present, the applicable standards for assessing compliance in relation to air quality are those outlined in Table 8-1.

8.2.1.2 Dust Deposition Guidelines

The impact of dust is generally assessed by measuring dust deposition rates, which reflect the amount of settleable particulate matter deposited over time.

There are currently no statutory Irish standards or EPA-specific limit values for dust deposition from inert mineral dust. However, the EPA's Environmental Management in the Extractive Industry (Non-Scheduled Minerals) guidance (EPA, 2006) recommends applying the German TA Luft standard for assessing nuisance dust impacts at infill boundaries.

The TA Luft standard (German VDI 2119, 2002) sets a maximum permissible dust deposition rate of 350 mg/m²/day, averaged over a 30-day period, at any receptor outside the site boundary. This standard is widely used in Ireland and is supported by the Bergerhoff Method, which is recognised by both the EPA and local authorities.

For the purpose of this assessment, the TA Luft limit value of 350 mg/m²/day has been adopted to evaluate potential dust deposition impacts from the operational phase of the infill.

8.2.1.3 Respirable Crystalline Silica (RCS) Standards

Respirable Crystalline Silica (RCS) is a fine particulate generated during infilling activities involving silica-containing materials such as rock. RCS is not regulated under ambient air quality standards or dust deposition guidelines, as its primary concern is occupational exposure.

In Ireland, the Health and Safety Authority (HSA) set an Occupational Exposure Limit Value of (OLEV) for RCS at 0.1 mg/m³ averaged over an 8-hour reference period, as outlined in Chemical Agents and Carcinogens Code of Practice.

8.2.1.4 Air Quality and Traffic Impact Assessment Criteria

The TII document *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2025) details a methodology for determining air quality impact significance criteria for road schemes which can be applied to any project that causes a change in traffic. The degree of impact is determined based on the percentage change in pollutant concentrations relative to the 'Do Nothing' scenario. The TII significance criteria are outlined in Table 4.9 of *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2025) and reproduced in Table 8-2. These criteria have been adopted for the Proposed Development to predict the effect of NO₂, PM₁₀ and PM_{2.5} emissions as a result of the Proposed Development.

Table 8-2 Air Quality Impact Descriptors

Long Term Average Concentration at Receptor in Assessment Year	% Change in Concentration Relative to Air Quality Limit Value (AQLV)			
	1%	2-5%	6-10%	>10%
75% or less of AQLV	Neutral	Neutral	Slight	Moderate
76-94% of AQLV	Neutral	Slight	Moderate	Moderate
95%-102% of AQLV	Slight	Moderate	Moderate	Substantial
103%-109% of AQLV	Moderate	Moderate	Substantial	Substantial
110% or more of AQLV	Moderate	Substantial	Substantial	Substantial

Source: Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106 (TII, 2025)

8.2.2 Construction Phase

For the purposes of assessment, the construction phase will include site clearance of the area, widening of the entrance road and establishment of the construction compound. Given the scale and nature of the works, a quantitative air quality assessment is not required.

8.2.3 Operational Phase

8.2.3.1 Dust

A Disamenity Dust Assessment has been carried out in accordance with the IAQM Guidance on Mineral Dust (2016). This assessment provides a structured, qualitative evaluation of the potential for nuisance dust impacts on sensitive receptors located within 400m of the proposed infill. It considers factors such as the scale of dust-generating activities, prevailing meteorological conditions, receptor sensitivity, and the effectiveness of the pathway between source and receptor. A Disamenity Dust Assessment has been carried out in order to determine the overall impact of the Proposed Development and is presented in Section 8.5.2.1.1.1.5.

8.2.3.2 Traffic Emissions

Operational phase traffic has the potential to affect air quality. The TII guidance *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2025), states that road links meeting one or more of the following criteria can be defined as being 'affected' by a proposed development and should be included in the local air quality assessment. While the guidance is specific to infrastructure projects, its approach may be applied to other developments where a material change in traffic volumes or characteristics is expected:

- Annual average daily traffic (AADT) changes by 1,000 or more;
- Heavy duty vehicle (HDV) AADT changes by 200 or more;
- Daily average speed change by 10 kph or more;

- Peak hour speed change by 20 kph or more; or
- A change in road alignment by 5m or greater.

Traffic flow information was obtained from Transport Insights (2026) for the purposes of this assessment. Two different year scenarios are presented in Table 8-3 for the operational phase vehicle trip generation data. The 'Do Nothing' and 'Do Something' scenarios for the Opening Year (2027) and Design Year (2032)

The figures presented in Table 8-3 represent total AADT volumes for each road link under the 'Do Nothing' and 'Do Something' scenarios. These are absolute traffic volumes, not percentage increases. The data was provided directly by Transport Insights and is based on project-specific traffic modelling undertaken by Transport Insights.

Table 8-3 Traffic Data

Link Number	Road Name	Base Year (2026) AADT	Opening Year (2027)		Design Year (2032)	
			Do Nothing	Do Something	Do Nothing	Do Something
			AADT	AADT	AADT	AADT
1	L2117 (S)	1008	1024	1036	1083	1095
2	L2117 (N)	1008	1024	1036	1083	1095

The operational phase traffic associated with the Proposed Development has been considered in the context of air quality impacts. Traffic data provided by Transport Insights indicates that no individual road link will experience an increase of more than 1,000 AADT due to the Proposed Development. Therefore, while operational traffic emissions have been considered, they are not expected to result in significant air quality effects on local air quality, and no further modelling is required.

8.3 The Existing and Receiving Environment (Baseline Situation)

The Proposed Development site forms part of the wider Clonreher Bog area, which historically operated as peatland. Following the cessation of peat-related activity, the lands regenerated naturally and have remained unused for productive agricultural purposes due to wet ground conditions. Surrounding lands comprise a mix of agricultural holdings, uncultivated areas, and established industrial and waste-related operations, reflecting a long-standing pattern of mixed rural and industrial land use in this locality.

In accordance with the Laois County Development Plan 2021–2027, the Proposed Development site is located within an “*Area under Strong Urban Influence*” and lies approximately 2.5 kilometres from both existing and proposed residential zoned lands.

The wider area has an extensive history of waste-related activity, including the former Portlaoise Landfill and a number of licensed waste and industrial facilities located within proximity to the Proposed Development site. However, there is no record of previous development or landfilling activity on the Proposed Development site itself.

The Proposed Development arises from current construction activities in the Portlaoise area, with suitable inert material to be sourced as a by-product under Regulation 27 of the European Communities (Waste Directive) Regulations 2011

8.3.1 Air Quality

Air quality monitoring programs have been undertaken in recent years by the EPA. The most recent annual report on air quality in Ireland is “*Air Quality In Ireland 2024*” (EPA, 2025). The EPA website details the range and scope of monitoring undertaken throughout Ireland and provides both monitoring data and the results of previous air quality assessments (EPA, 2025).

As part of the implementation of the Framework Directive on Air Quality (1996/62/EC), four air quality zones have been defined in Ireland by the EPA for air quality management and assessment purposes.

The main areas defined in each zone are:

- ❖ **Zone A:** Dublin Conurbation
- ❖ **Zone B:** Cork Conurbation
- ❖ **Zone C:** Other cities and large towns comprising Limerick, Galway, Waterford, Drogheda, Dundalk, Bray, Navan, Ennis, Tralee, Kilkenny, Carlow, Naas, Sligo, Newbridge, Mullingar, Wexford, Letterkenny, Athlone, Celbridge, Clonmel, Balbriggan, Greystones, Leixlip and Portlaoise.
- ❖ **Zone D:** Rural Ireland, i.e., the remainder of the State excluding Zones A, B and C.

The site is located in Kyletalesha, Portlaoise, Co. Laois and falls into ‘Zone D’ of Ireland which is described by the EPA as ‘*Rural Ireland, i.e., the remainder of the State excluding Zones A, B and C.*’

The EPA launched a national air quality forecast in November 2023, to provide greater information to the public regarding expected air quality in Ireland for up to three days - “Today”, “Tomorrow” and the “Day after Tomorrow”.

Forecasts include daily Air Quality Index for Health (AQIH), Particulate Matter (PM), nitrogen dioxide (NO₂) and ozone (O₃). PM, NO₂ and O₃ are the three main air pollutants impacting human health in Ireland. All pollutants mapped are presented on the AQIH scale (1 – 10). The forecast maps are uploaded twice daily, once in the morning and once in the evening.

In conjunction with individual local authorities, the EPA undertakes ambient air quality monitoring at specific locations throughout the country in the urban and rural environment; an Air Quality Report based on data from monitoring stations and a number of mobile air quality units is developed on an annual basis. The EPA’s most recent publication ‘Air Quality in Ireland, 2024’ reports the quality of the air in Ireland based on the data from the National Ambient Air Quality Monitoring Network throughout the year 2024 (EPA, 2025).

When assessing air quality, the EPA focuses on two main pollutants: particulate matter and nitrogen oxides. Measured concentrations of NO₂ for the years 2023 and 2024 are presented in Table 8-4 for Zone D monitoring stations.

Table 8-4 Concentrations of NO₂ at Zone D Monitoring Stations

Station	Objective	Concentration (µg/m ³)		Limit or Threshold Value
		2023	2024	
Birr	Annual Mean NO ₂ ³	11.3	11.1	40 µg/m ³
	Days >200µg/m ³	0	0	18 days
Briarhill	Annual Mean NO ₂ ⁴	16.1	-	40 µg/m ³
	Days >200µg/m ³	0	-	18 days
Carrick-on-Shannon	Annual Mean NO ₂	10.0	11.9	40 µg/m ³
	Days >200µg/m ³	0	0	18 days
Castlebar	Annual Mean NO ₂	6.6	6.7	40 µg/m ³
	Days >200µg/m ³	0	0	18 days
Cork Mallow	Annual Mean NO ₂	-	14.0	40 µg/m ³
	Days >200µg/m ³	-	0	18 days
Edenderry	Annual Mean NO ₂	8.6	9.7	40 µg/m ³
	Days >200µg/m ³	0	0	18 days
Emo Court Co. Laois	Annual Mean NO ₂	2.3	2.6	40 µg/m ³
	Days >200µg/m ³	0	0	18 days
Kilkitt	Annual Mean NO ₂	1.7	2.3	40 µg/m ³
	Days >200µg/m ³	0	0	18 days

Based on the data summarised in Table 8-4, existing baseline air quality for the area in which the site is located can be characterised as being of good quality with no exceedances of the Air Quality Regulations limit values of specific pollutants. The results show that current levels

³ NO₂ annual mean limit value for the protection of human health: 40 µg/m³ per station

⁴ NO₂ annual mean limit value for the protection of human health: 40 µg/m³ per station

of NO₂ are well below the annual mean and 1-hour maximum limit values. In the year 2023, annual mean concentrations of NO₂ ranged from 1.7 – 16.1 µg/m³ across all Zone D stations, with no exceedance of the maximum hourly limit (EPA, 2024). In the year 2024, annual mean concentrations of NO₂ ranged from 2.3 – 14.0 µg/m³ across all Zone D stations, with no exceedance of the maximum hourly limit (EPA, 2025).

The average concentration of NO₂ in 2024 was 8.33 µg/m³. EPA 2024 background concentrations have been used in combination with correction factors to estimate annual average NO₂ concentrations in the region of the Proposed Development for 2025. These factors have been adapted from both TII (2011) and DEFRA roadside NO₂ projection factors. While developed for UK conditions, DEFRA's projection factors are commonly used in Irish assessments where localised projection tools are not available. The term 'projection factor' is used in DEFRA guidance to describe year-on-year adjustments to NO₂ concentrations based on expected changes in traffic and emissions. Based on these correction factors, the current NO₂ concentration in the region of the Proposed Development is 7.38 µg/m³.

Measured concentrations of PM₁₀ for the years 2023 and 2024 are presented in Table 8-5 for Zone D monitoring stations.

Table 8-5 Concentrations of PM₁₀ at Zone D Monitoring Stations

Station	Objective	Concentration (µg/m ³)		Limit or Threshold Value
		2023	2024	
Askeaton, Co. Limerick	Annual Mean PM ₁₀ ⁵	8.4	8.4	40 µg/m ³
	Days >50µg/m ³⁶	0	0	35 days
Birr	Annual Mean PM ₁₀	13.1	13.0	40 µg/m ³
	Days >50µg/m ³	1	0	35 days
Carnsore	Annual Mean PM ₁₀	-	14.8	40 µg/m ³
	Days >50µg/m ³	-	0	35 days
Carrick-on-Shannon	Annual Mean PM ₁₀	8.9	9.6	40 µg/m ³
	Days >50µg/m ³	0	0	35 days
Castlebar	Annual Mean PM ₁₀	9.9	9.9	40 µg/m ³
	Days >50µg/m ³	0	0	35 days

⁵ PM₁₀ annual mean limit value for the protection of human health: 40 µg/m³ per station

⁶ PM₁₀ daily limit for the protection of human health: No more than 35 days in a year >50 µg/m³ per station

Station	Objective	Concentration ($\mu\text{g}/\text{m}^3$)		Limit or Threshold Value
		2023	2024	
Cavan	Annual Mean PM_{10}	10.0	10.6	40 $\mu\text{g}/\text{m}^3$
	Days >50 $\mu\text{g}/\text{m}^3$	0	0	35 days
Claremorris	Annual Mean PM_{10}	8.1	8.3	40 $\mu\text{g}/\text{m}^3$
	Days >50 $\mu\text{g}/\text{m}^3$	0	0	35 days
Cobh Carrignafof	Annual Mean PM_{10}	11.8	11.5	40 $\mu\text{g}/\text{m}^3$
	Days >50 $\mu\text{g}/\text{m}^3$	0	0	35 days
Cork Harbour, Cobh	Annual Mean PM_{10}	11.4	-	40 $\mu\text{g}/\text{m}^3$
	Days >50 $\mu\text{g}/\text{m}^3$	0	-	35 days
Cork Mallow	Annual Mean PM_{10}	10.5	9.9	40 $\mu\text{g}/\text{m}^3$
	Days >50 $\mu\text{g}/\text{m}^3$	2	0	35 days
Edenderry	Annual Mean PM_{10}	16.3	15.6	40 $\mu\text{g}/\text{m}^3$
	Days >50 $\mu\text{g}/\text{m}^3$	6	5	35 days
Enniscorthy	Annual Mean PM_{10}	13.3	14.1	40 $\mu\text{g}/\text{m}^3$
	Days >50 $\mu\text{g}/\text{m}^3$	2	3	35 days
Galway Ballinasloe	Annual Mean PM_{10}	-	12.6	40 $\mu\text{g}/\text{m}^3$
	Days >50 $\mu\text{g}/\text{m}^3$	-	0	35 days
Killarney, Co. Kerry	Annual Mean PM_{10}	8.9	11.3	40 $\mu\text{g}/\text{m}^3$
	Days >50 $\mu\text{g}/\text{m}^3$	0	0	35 days
Kilkitt	Annual Mean PM_{10}	7.1	7.1	40 $\mu\text{g}/\text{m}^3$
	Days >50 $\mu\text{g}/\text{m}^3$	0	0	35 days

Station	Objective	Concentration ($\mu\text{g}/\text{m}^3$)		Limit or Threshold Value
		2023	2024	
Longford	Annual Mean PM_{10}	13.1	15.7	40 $\mu\text{g}/\text{m}^3$
	Days $>50\mu\text{g}/\text{m}^3$	2	7	35 days
Macroon	Annual Mean PM_{10}	11.3	11.9	40 $\mu\text{g}/\text{m}^3$
	Days $>50\mu\text{g}/\text{m}^3$	0	0	35 days
Malin Head	Annual Mean PM_{10}	12.8	13.3	40 $\mu\text{g}/\text{m}^3$
	Days $>50\mu\text{g}/\text{m}^3$	0	0	35 days
Roscommon Town	Annual Mean PM_{10}	9.7	10.2	40 $\mu\text{g}/\text{m}^3$
	Days $>50\mu\text{g}/\text{m}^3$	0	1	35 days
Tipperary Town	Annual Mean PM_{10}	10.8	10.7	40 $\mu\text{g}/\text{m}^3$
	Days $>50\mu\text{g}/\text{m}^3$	0	1	35 days

As is evident from the results shown in Table 8-5, current levels of PM_{10} are well below the annual mean limit value. In the year 2023, annual mean concentrations of PM_{10} ranged from 7.1 – 16.3 $\mu\text{g}/\text{m}^3$ across all Zone D stations, with no exceedance of short-term limit values (EPA, 2024). In the year 2024, annual mean concentrations of PM_{10} ranged from 7.1 – 15.7 $\mu\text{g}/\text{m}^3$ across all Zone D stations, with no exceedance of short-term limit values (EPA, 2025).

For PM_{10} projections, DEFRA does not provide straightforward year-on-year factors like it does for NO_2 . In the absence of detailed local projection tools, a general annual reduction is applied to reflect expected improvements in vehicle emissions and air quality trends.

While a 2-4% reduction is commonly used in practice, a 2% reduction has been applied to remain conservative. This approach helps ensure that projected concentrations are not underestimated, which is particularly important when assessing potential impacts on sensitive receptors.

The average concentration of PM_{10} in 2024 was 11.5 $\mu\text{g}/\text{m}^3$. A conservative estimate of the background PM_{10} levels for the region of the Proposed Development is therefore 11.27 $\mu\text{g}/\text{m}^3$.

Measured concentrations of $\text{PM}_{2.5}$ for the years 2023 and 2024 are presented in Table 8-6 for Zone D monitoring stations.

Table 8-6 Concentrations of PM_{2.5} at Zone D Monitoring Stations

Station	Averaging Period	Year	
		2023	2024
Askeaton, Co. Limerick	Annual Mean PM _{2.5} (µg/m ³) ⁷	4.8	4.9
Birr		8.3	8.3
Carnsore		-	8.9
Carrick-on-Shannon		5.4	6.0
Cavan		6.4	7.1
Claremorris		5.2	5.4
Cobh Carrignafof		6.8	6.7
Cork Glanmire Rd		7.6	-
Cork Mallow		6.1	6.4
Edenderry		12.4	12.0
Enniscorthy		9.0	9.2
Galway Ballinasloe		-	9.3
Killarney, Co. Kerry		5.4	7.0
Longford		9.2	9.5
Macroom		7.3	8.0
Malin Head		6.8	7.3
Roscommon Town		6.4	6.6
Tipperary Town		6.7	6.9

As is evident from the results shown in Table 8-6, current levels of PM_{2.5} are well below the annual mean limit value of 25 µg/m³. In the year 2023, annual mean concentrations of PM_{2.5} ranged from 4.8 – 12.4 µg/m³ across all Zone D stations (EPA, 2024). In the year 2024, annual mean concentrations of PM_{2.5} ranged from 4.9 – 12.0 µg/m³ across all Zone D stations (EPA, 2025).

For PM_{2.5} projections, DEFRA does not provide straightforward year-on-year factors like it does for NO₂. In the absence of detailed local projection tools, a conservative annual reduction

⁷ Annual average limit value - 25 µg/m³ (EU Council Directive 2008/50/EC & S.I. No. 739 of 2022)

of 2% is applied to recent measured or modelled concentrations. This aligns with the approach used for PM₁₀ and ensures consistency across assessments.

The average concentration of PM_{2.5} in 2024 was 7.62 µg/m³. A conservative estimate of the background PM₁₀ levels for the region of the Proposed Development is therefore 7.47 µg/m³.

8.3.2 Macroclimate

Ireland has a typical maritime climate, largely due to its proximity to the Atlantic Ocean and the presence of the Gulf Stream. Due to the moderating effects of the Gulf Stream, Ireland does not suffer the temperature extremes that are experienced by many other countries at a similar latitude. Mean annual temperatures generally range between 9°C and 10°C. Winters tend to be cool and windy while summers are mostly mild and less windy. The prevailing wind direction is between the south and west with average annual wind speeds ranging between 6 knots in parts of south Leinster to over 15 knots in the extreme north. Rainfall in Ireland occurs throughout the year with reasonable frequency. The highest rainfall occurs in the western half of the country and on high ground; and generally, decreases towards the northeast. As the prevailing winds are from the west-southwest, the west of Ireland experiences the largest number of wet days. The area of least precipitation is along the eastern seaboard of the country.

8.3.3 Microclimate

The synoptic meteorological station at Mullingar is located approximately 51km north of the Proposed Development; and for the purposes of this chapter, weather data collected here may be considered similar to that which is experienced in the area of the site.

The weather in the area of the site is generally dominated by south-westerly winds, driven by the North Atlantic and the influence of the Polar Front. These winds are frequent year-round and bring moist maritime air, resulting in mild temperatures and frequent rainfall.

Based on meteorological data at Mullingar over the last 3 years, the mean January temperature is 4.6°C, while the mean July temperature is 15.1°C.

8.3.3.1 Rainfall

Table 8-7 illustrates the monthly and annual rainfall data collected over a 3-year period (2023-2025) at Mullingar. The annual rates of precipitation ranged from 891.5mm in 2024 to 1158.5mm in 2023, with distribution of the highest monthly rainfall values falling mainly in the autumn and winter months. This is broadly within the expected range of the eastern half of the country.

Table 8-7 Monthly Rainfall Values (mm) for Mullingar Weather Station from January 2023 to December 2025 (Source: Met Éireann)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2025	59.8	70.6	24.0	86.1	64.5	92.0	77.1	50.4	90.5	118.3	155.1	85.3	973.7
2024	83.1	91.9	117.3	97.0	57.1	49.4	65.6	82.7	47.5	59.9	75.2	64.8	891.5
2023	81.1	29.8	141.4	82.8	36.4	53.3	178.8	114.3	132.9	104.5	71.2	132.0	1158.5

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
LTA ⁸	91.4	76.4	69.2	69.5	66.1	75.1	79.5	84.9	76.9	99.6	98.1	99.6	986.3

8.3.3.2 Wind

Wind at a particular location can be influenced by a number of factors, such as obstructions by trees or buildings, the nature of the terrain, and deflection by nearby mountains or hills. Wind blows most frequently from the south and west for open sites while winds from the northeast and north occur less often. The analysis of hourly weather data from Mullingar synoptic weather station over a period of 30 years (1995-2025) suggests that the predominant wind direction blows from the southeast, with windspeeds of between 4 and 6 knots occurring most frequently.

Figure 8-1 provides a wind speed frequency distribution which represents wind speed classes and the frequency at which they occur (% of time) at Mullingar weather station over a period of 30 years. Wind speeds of 5 knots have the highest frequency, occurring approximately 12.05% of the time.

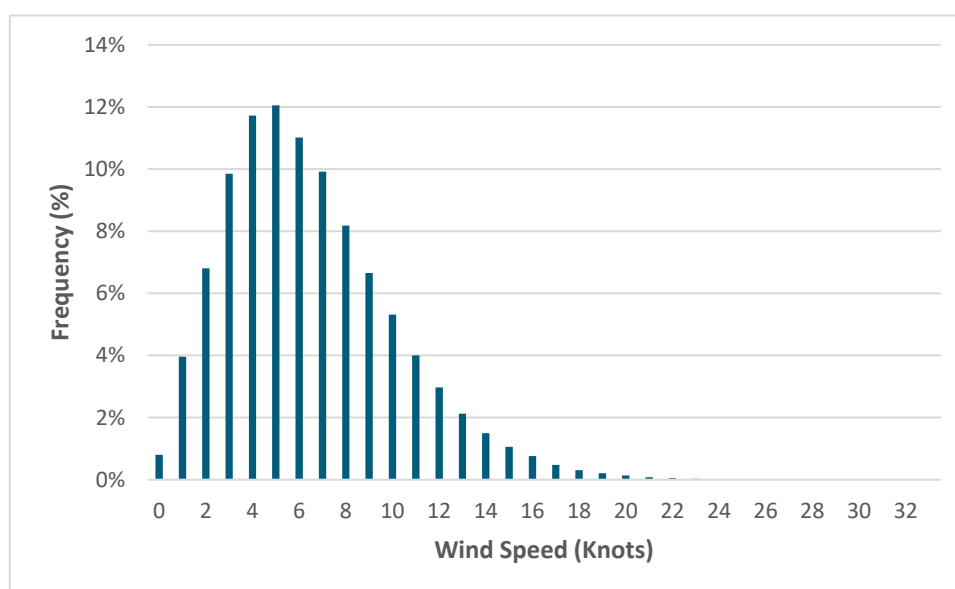


Figure 8-1 Wind Speed Frequency Distribution at Mullingar Synoptic Weather Station over a period of 30 years (1995-2025) (Developed using Met Éireann Hourly Data)

Figure 8-2 provides a wind rose of the predominant wind directions and associated wind speeds at Mullingar Synoptic Weather Station. As is visible from Figure 8-2, the prevailing winds are from a south-westerly direction, with an annual incidence of 28.66% for winds between 200 and 250 degrees. The most frequent wind speed associated with this wind direction is between 7 and 10 knots, which is considered a 'Gentle Breeze' in terms of the Beaufort scale. This wind direction and wind speed occurs in combination approximately 10.09% of the time. The overall most common windspeed is between 4 and 6 knots, occurring

⁸ Long-term average

in 34.78% of incidences, and wind speeds of between 7 and 10 knots occurring in 30.05% of incidences.

The lowest frequency is for winds blowing from the northern quadrant at approximately 3.75% of the time. The incidence of wind between 1 and 6 knots is approximately 55.34% with wind speeds of above 17 knots (8.7 m/s) occurring in just 1.32% of incidences. This wind rose is broadly representative of the prevailing conditions experienced at the site.

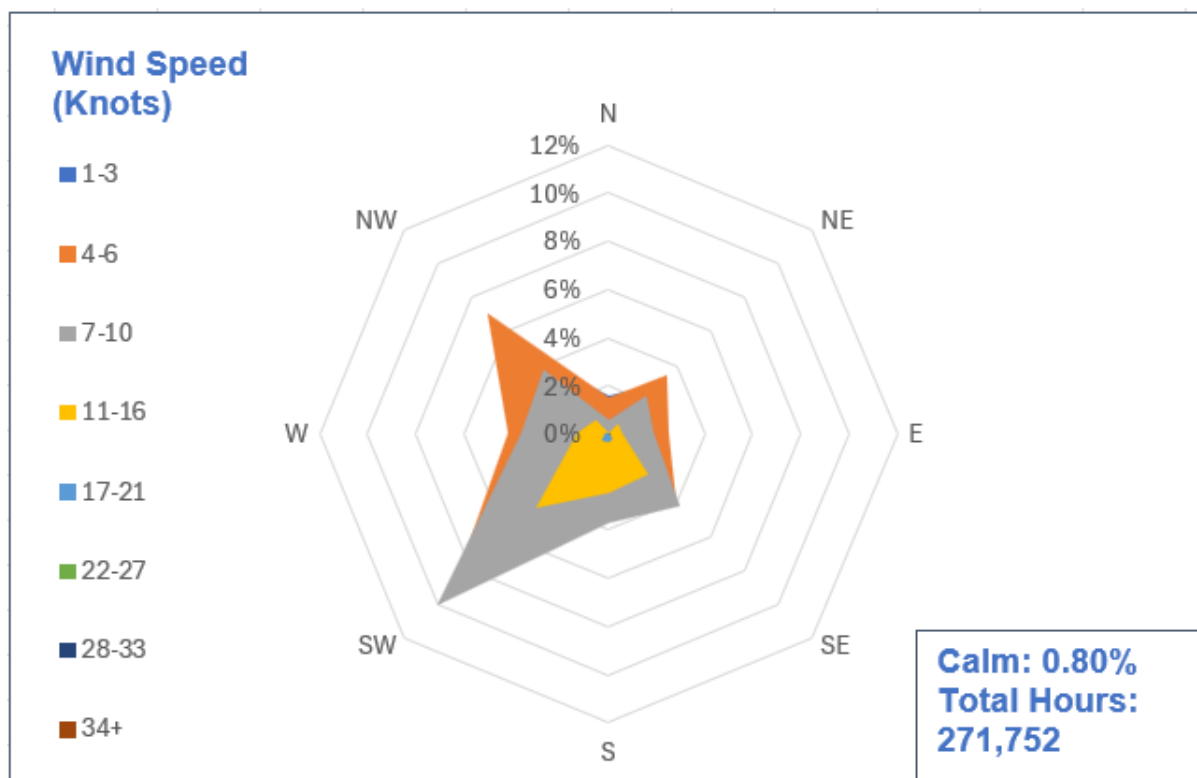


Figure 8-2 Wind Rose at Mullingar Synoptic Weather Station over a period of 30 years (1995-2025) (Developed using Met Éireann Hourly Data)

8.4 Characteristics of the Proposed Development

See chapter 2 for a description of all components of the Proposed Development.

8.5 Potential Effect of the Proposed Development

8.5.1 Construction Phase

For the purposes of assessment, the construction phase will include site clearance of the area, widening of the entrance road and establishment of the construction compound. Given the scale and nature of the works, a quantitative air quality assessment is not required.

8.5.2 Operational Phase

8.5.2.1 Dust

The primary air quality impacts associated with infilling activities is dust accumulation resulting from deposition of dispersed particles. Infilling activities and ancillary facilities, by their nature, generate dust. The dust arises mainly from inert soil and rock materials. Furthermore, the movement of vehicles and use of machinery during this phase will potentially generate exhaust

fumes and consequently potential emissions of volatile organic compounds, nitrogen oxides, sulphur oxides, and particulate matter (PM_{2.5} and PM₁₀).

The primary sources of dust identified include site preparation, infilling of materials, stockpiling, handling, and loading of materials, traffic movements on internal and external haul routes, stripping, and overburden storage. They are generally dispersed sources rather than specific point sources, which dictates the measures required to mitigate potential dust-related impacts. Dust typically becomes airborne due to the action of wind or activities such as excavating, drilling, or screening. Dust emissions associated with vehicular movements are largely due to the resuspension of particulate materials that are present on road surfaces. The movement of vehicles within the facility and to and from the facility to the external road network also has potential to cause dust due to deposition from the vehicles themselves if appropriate mitigation measures are not considered.

The potential for dust generation depends on site activity, particle size, the moisture content of materials, and meteorological conditions. The type of material being extracted and processed can also have a significant influence on potential emissions. Soil and stone deposits may possess an inherently high moisture content, which can cause particles to adhere and thereby affords a high degree of natural mitigation. However, this does not negate the potential for fugitive emissions from this material if it dries out, especially during high wind conditions. The prevailing meteorological conditions have the largest impact on the rate of dust dispersion. During periods of prolonged dry weather, there is the potential for dust dispersion rates to be higher than average. Where rainfall has or is occurring, dust emissions can be dramatically reduced.

Dust arising from the infilling can reduce amenity in the local community if visible dust plumes and dust soiling are present. The coarser dust associated with these effects may be referred to as 'nuisance dust'. Smaller dust particles remain airborne for longer and have the potential to increase local ambient air concentrations of suspended particulate matter (PM₁₀ and PM_{2.5}) which can be associated with a range of health concerns (IAQM, 2016). It is further noted that ambient air quality limit values for these pollutants are rarely exceeded in the vicinity of most infilling sites as they are commonly located in rural areas where traffic pollution is significantly less than in urban areas.

According to Institute of Air Quality Management Guidance on the Assessment of Mineral Dust Impacts for Planning (IAQM, 2016), the experience of the IAQM Working Group together with published studies and anecdotal evidence on the change in both airborne concentrations and the rate of deposition with distance, suggests that dust impacts will occur mainly within 400m of the operation, even at the dustiest of sites. Continuous or stark concerns about dust are most likely to be experienced within 100m of the dust source; the greatest potential for high rates of dust deposition and elevated PM₁₀ concentrations occurs within this distance.

The significant potential impacts associated with dust emissions from the Proposed Development are outlined in Table 8-8:

Table 8-8 Potential Impacts Associated with Dust Emissions

Element	Description	Potential Risk
Source	Stockpiling of materials	Particulate matter on surface of stockpiles
	Extraction and loading of materials	Particulate matter being handled and re-suspended
	Traffic movements	Resuspension of particulate matter and deposition due to facility vehicles
Pathway	Dry days with wind speeds >5m/s	Potential for particulate suspension and deposition
	Distance between sensitive receptor and dust source <400m	Potential for particulate deposition
Receptors	Human sensitive receptors	Health impacts Visual impacts

According to IAQM Guidance (2016), the primary factor influencing the Pathway is the distance between the sensitive receptor and the dust sources. However, other factors can cause a higher or a lower category to be assigned than would be the case based on distance alone. These factors include:

- Orientation of receptors relative to the prevailing wind direction; and
- Topography, terrain and physical features.

Meteorological conditions greatly affect the level of dust emissions and subsequent deposition downwind of the source; the most predominant being rainfall and wind speed. Relatively high levels of moisture in the surrounding air, soils, and precipitation helps to suppress dust due to the cohesive properties of water between dust particles. The least favourable meteorological conditions for dust generation would typically be warm days with strong winds and low precipitation.

Table 8-9 outlines the hourly percentage distribution of wind speed and direction at Mullingar synoptic weather station over a 30-year period (1995-2025). This data is consistent with Figure 8-2 of this chapter and shows that the most frequent wind direction prevails from the southwest (28.66%). The corresponding most frequent wind speed is between 7 and 10 knots, which is considered a 'Gentle Breeze' in terms of the Beaufort scale; this wind direction and wind speed occurs in combination approximately 10.09% of the time.

Table 8-9 Percentage Distribution of Wind Speeds and Direction at Mullingar Weather Station (1995-2025)

Wind speed (Knots)		<1	1 - 3	4 - 6	7 - 10	11-16	17-21	22-27	28-33	34+	% Dry Days ⁹
Wind Direction	Degrees										
North	350 - 10	0.80%	1.60%	1.53%	0.56%	0.06%	0%	0%	0%	0%	37.61%
North-east	20 - 70		2.87%	3.48%	2.20%	0.58%	0.02%	0%	0%	0%	
East	80 - 100		1.60%	2.48%	1.89%	0.57%	0.02%	0%	0%	0%	
South-east	110 - 160		2.03%	3.96%	4.20%	2.36%	0.26%	0.02%	0%	0%	
South	170 - 190		1.46%	2.81%	3.69%	2.48%	0.32%	0.03%	0%	0%	
South-west	200 - 250		4.62%	9.18%	10.09%	4.30%	0.42%	0.04%	0%	0%	
West	260 - 280		2.07%	4.20%	3.60%	1.28%	0.13%	0.01%	0%	0%	
North-west	290 - 340		4.31%	7.12%	3.83%	0.78%	0.04%	0%	0%	0%	

8.5.2.1.1 Sensitivities of People to Dust Soiling Effects

For the sensitivity of people and their property to soiling, the IAQM (2024) recommends that the air quality practitioner uses professional judgment to identify where on the spectrum between high and low the sensitivity of a receptor lies, taking into account the following general principles set out in Table 8-10.

Table 8-10 Sensitivities of People to Dust Soiling Effects (Source: IAQM, 2024)

Sensitivity	Features	Indicative Examples
High	- Users can reasonably expect enjoyment of a high level of amenity; or - The appearance, aesthetics or value of their property would be diminished by soiling; and - The people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of the use of the land;	- Dwellings; - Museums and other culturally important collections; and - Medium and long term car parks and show rooms.
Medium	Users would expect¹⁰ to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or	- Parks; and - Places of work.

⁹ Dry days are defined as days with less than 0.2mm of rainfall, in line with IAQM and best practice.

¹⁰ People's expectations will vary depending on the existing dust deposition in the area.

Sensitivity	Features	Indicative Examples
	- The appearance, aesthetics or value of their property could be diminished by soiling; or - The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land.	
Low	- The enjoyment of amenity would not reasonably be expected; or - Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or - There is a transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use for the land.	- Playing fields, - Farmland (unless commercially sensitive horticultural); - Footpaths; - Short-term carparks¹¹; and - Places of work.

Sensitive receptors (SRs), as noted in Table 8-11, in the vicinity of the Proposed Development are described as residential dwellings (high sensitivity receptors as per Table 8-10).

A Disamenity Dust Assessment has been carried out in order to determine the overall impact of the Proposed Development and is presented in the following Section 8.5.2.1.1.

8.5.2.1.1.1 Disamenity Dust Assessment

In line with IAQM Guidance (2016), the following section provides a series of assessment matrices which have been used to estimate the Dust Impact Risk, the Pathway Effectiveness and the Likely Magnitude of Disamenity Effects at each representative receptor within 400m of the Proposed Development. The latter is used to determine whether there is a possibility of significant effects on the surrounding area.

8.5.2.1.1.2 Estimation of Residual Source Emissions

According to IAQM Guidance (2016), residual source emissions are based on the scale of the anticipated operations and can be classified as **Small**, **Medium**, or **Large**.

An example of a large potential dust magnitude from sight preparation may include a working area of >10 hectares, bunds >8m in height, >100,000m³ material movement, >10 heavy plant simultaneously active and using fine grained and friable material. A small potential magnitude

¹¹ Car parks have a range of sensitivities depending on the duration and frequency that people would be expected to park their cars there, and the level of amenity they could reasonably expect whilst doing so. Car parks associated with workplace or residential parking might have a high level of sensitivity compared to car parks used less frequently and for shorter durations, such as those associated with shopping. Cases should be examined on their own merits.

may include working area <2.5 hectares, bunds <4m in height, <20,000m³ material movement, <5 heavy plant simultaneously active, all bunds seeded, and using material with a high moisture content.

The operational site of the Proposed Development is 2.92 hectares in size and the materials to be infilled are soil and stone. The primary sources of dust associated with the Proposed Development include stockpiling, handling, and loading of materials, and traffic movements on internal and external haul routes. Having regard to the criteria outlined above, and to ensure the assessment is conducted under a worst-case scenario residual source emissions from the Proposed Development have been classified as **Medium**.

8.5.2.1.1.3 Estimation of Pathway Effectiveness

According to IAQM (2016), residents living in proximity to operations that emit particulate matter can potentially be affected by dust up to 400m from the operational site. It is noted that distances refer to 'dust generating activities' rather than the site boundary and this may refer to infilling areas.

Representative sensitive receptors positioned within a 400m radius of the site boundary have been identified in Figure 8-3 and further detailed in Table 8-11. The closest sensitive receptor to site boundary, as indicated in Figure 8-3 and Table 8-11, is SR1 which is situated ca. 92.5m north-east of the site boundary.

Table 8-11 Sensitive Receptors located within a 400m Radius of the Site Boundary

Sensitive Receptor ID	ITM Coordinates	Distance from landholding (m)	Orientation relative to site	Receptor Type	Sensitivity
SR1	645863, 702851	92.5	North-east	Residential	High ¹²
SR2	645948, 702929	204	North-east	Residential	High
SR3	645995, 702958	260	North-east	Residential	High
SR4	645907, 703136	323.5	North-east	Residential	High
SR5	645822, 703198	351.5	North	Residential	High

¹² Users can reasonably expect an enjoyment of a high level of amenity; or the appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land (IAQM, 2024) (See Table 8-10).



Figure 8-3. Sensitive Receptors

The site-specific factors considered in determining the effectiveness of the pathway are the distance and direction of receptors relative to the prevailing wind directions. There are a number of receptors within 400m of the site and therefore each receptor was considered separately. For each receptor within 400m of the site boundary, the wind direction from the dust source was calculated. The frequencies of wind in each direction, in conjunction with the number of dry days, were then calculated based on meteorological data at Mullingar synoptic weather station. Moderate to high windspeeds (above 5m/s (7-10 knots)) have been utilised in this assessment as these conditions are most likely to result in fugitive dust emissions.

Table 8-12 provides a summary of all events of hourly wind speeds above 5m/s and corresponding directions from Mullingar synoptic weather station. Approximately 55.34% of all hourly data featured winds of below 5m/s; these measurements have been excluded for the purposes of this assessment. Data displayed in Table 8-12 shows south-west as the prevailing wind direction. In light of this data, in combination with distances relative to the operational area, sensitive receptors were assessed and those with potential to be affected by fugitive dust emissions were identified.

Table 8-12 Summary of Prevailing Wind Directions at Mullingar Synoptic Weather Station above 5m/s (7-10 knots)

Wind direction prevailing	Frequency (%)	Sensitive Receptor likely to be affected (ID)	% Dry days (1995-2025) ¹³
North	0.62		37.61%
North-east	2.79		
East	2.49		
South-east	6.83		
South	6.53	SR5	
South-west	14.85	SR1, SR2, SR3, SR4	
West	5.02		
North-west	4.65		

SR1, SR2, SR3 and SR4 are located to the north-east of the Proposed Development would require prevailing winds from the south-west to be potentially impacted by the Proposed Development; the frequency of winds (>5m/s) occurring from the direction of the dust source on dry days is <6% frequency (5.59%).

SR5 is located to the north and would require prevailing winds from the south to be potentially impacted by the Proposed Development; the frequency of winds (>5m/s) occurring from the direction of the dust source on dry days is <3% frequency (2.46%).

The resulting frequency of moderate to high wind speeds with the potential of carrying airborne dust towards receptors were then assigned to the categories in Table 8-13. It has been determined that the frequency of appropriate conditions for fugitive emissions to occur at receptors SR1, SR2, SR3 and SR4 is <12% and is therefore considered 'Moderately Infrequent' as per Table 8-13 (i.e., the frequency of winds (>5m/s) from the direction of the dust source on dry days are less than 12% but greater than 5%). The frequency of appropriate conditions for fugitive emissions to occur at SR5 is <5% and is therefore considered 'Infrequent' as per Table 8-13.

¹³ Dry days are defined as days with less than 0.2mm of rainfall, in line with IAQM and best practice.

Table 8-13 Categorisation of Frequency of Potentially Dusty Winds (Source: IAQM 2016)

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 Infrequent	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%

The categorisation in the following Table 8-14 was applied to the distance from each receptor to the source. As per Table 8-11, SR1 is less than 100m from the site boundary and is therefore considered 'Close' as per Table 8-14. SR2, SR3, SR4 and SR5 are all located between 200m and 400m from the site boundary and are therefore considered 'Distant' as per Table 8-14.

Table 8-14 Categorisation of Receptor Distance from Source (Source: IAQM 2016)

Category	Criteria
Distant	Receptor is between 200m and 400m from the dust source
Intermediate	Receptor is between 100m and 200m from the dust source
Close	Receptor is less than 100m from the dust source

The pathway effectiveness was then classified using the Frequency of Potentially Dusty Winds from Table 8-13 and the Receptor Distance from Source from Table 8-14. The frequency of potentially dusty winds has been determined as 'Moderately Infrequent' and the receptor distance from source has been categorised as 'Close' for SR1. Therefore, having regard to the results of both assessments, the pathway of effectiveness can be determined as **'Moderately Effective'** for receptor SR1 as per Table 8-15. The frequency of potentially dusty winds has been determined as 'Moderately Infrequent' and the receptor distance from source has been categorised as 'Distant' for receptors SR2, SR3, and SR4. Therefore, having regard to the results of both assessments, the pathway of effectiveness can be determined as **'Ineffective'** for receptors SR2, SR3, and SR4 as per Table 8-15. The frequency of potentially dusty winds has been determined as 'Infrequent' and the receptor distance from source has been categorised as 'Distant' for receptor SR5. Therefore, having regard to the results of both assessments, the pathway of effectiveness can be determined as **'Ineffective'** for receptor SR5 as per Table 8-15.

Table 8-15 Pathway Effectiveness (Source: IAQM 2016)

		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

8.5.2.1.1.4 Estimation of Dust Impact Risk

The Residual Source Emissions and the Pathway Effectiveness were then combined to predict the overall Dust Impact Risk as shown in the following Table 8-16. It can be determined from Table 8-16, having regard to the outcome of the preceding assessments, that the overall Dust Impact Risk at receptor SR1 resulting from the Proposed Development is '**Low**', while the overall Dust Impact Risk at receptors SR2, SR3, SR4 and SR5 resulting from the Proposed Development is '**Negligible**'.

Table 8-16 Estimation of Dust Impact Risk (Source: IAQM 2016)

		Residual Source Emissions		
		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

8.5.2.1.1.5 Estimation of Likely Magnitude of Disamenity Effects

The magnitude of the disamenity effect at each receptor was determined from the Dust Impact Risk as shown in Table 8-16 and the Receptor Sensitivity as shown in Table 8-10. In light of the above and having regard to the procedure outlined in the following Table 8-17, it can be concluded that the overall magnitude of disamenity effects is '**Slight Adverse**' at receptor SR1 and '**Negligible**' at receptors SR2, SR3, SR4 and SR5.

Table 8-17: Descriptors for Magnitude of Dust Effects (Source: IAQM 2016)

		Receptor Sensitivity			
		Low	Medium	High	
Dust Impact Risk	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	

The dust disamenity effects predicted at each receptor have been summarised in the following Table 8-18:

Table 8-18 Summary of Disamenity Dust Assessment

Receptor ID	Irish Grid Reference	Location Relative to the site	Residual Source Emissions	Pathway Effectiveness	Dust Impact Risk	Magnitude of Dust Effect
SR1	645863, 702851	North-east	Medium	Moderately Effective	Low	Slight Adverse
SR2	645948, 702929	North-east	Medium	Ineffective	Negligible	Negligible
SR3	645995, 702958	North-east	Medium	Ineffective	Negligible	Negligible
SR4	645907, 703136	North-east	Medium	Ineffective	Negligible	Negligible
SR5	645822, 703198	North	Medium	Ineffective	Negligible	Negligible

The Disamenity Dust Assessment has determined that SR1 may experience slight adverse effects, while SR2-SR5 may experience an overall negligible magnitude of dust effect. Although residual source emissions were classified as medium and receptor sensitivity as high for SR2-SR5, the pathway of effectiveness was found to be ineffective, resulting in a negligible dust impact risk at each location. Considering these factors together, the overall significance of impact for the Proposed Development is assessed as not significant. It is also anticipated that local terrain and natural features will act as barriers, reduce airborne concentrations due to impaction, and promote dispersion and dilution. Appropriate mitigation measures, as outlined in Section 8.6 will be implemented to further minimise any potential for fugitive dust emissions, minimising the potential for slight adverse effects on SR1 and ensuring that impacts on SRs remain negligible.

8.5.2.2 Dust Containing Silica

Exposure to fine respirable dust containing silica is recognised as a major occupational health risk in the infilling industry. Silica is a naturally occurring mineral found in most rocks, sands

and clays, and therefore workers in infills may be exposed during activities such as crushing, screening, and processing of materials. Additional exposure may occur due to dust recirculation within vehicle cabs and during handling of fine materials.

Respirable silica particles are extremely small and often invisible to the naked eye and can penetrate deep into the lungs. Long-term exposure to these particles can lead to the development of silicosis, a serious lung disease that impairs oxygen uptake in the bloodstream. Emerging evidence also links prolonged exposure to silica dust with an increased risk of lung cancer.

Silica dust exposure is primarily a concern for on-site workers and is not typically considered a significant risk for off-site receptors due to atmospheric dilution and dispersion. Nonetheless, silica dust can be effectively managed through the implementation of appropriate mitigation measures, as outlined in Section 8.6. These include dust suppression systems, enclosed cabins with filtered air, regular maintenance of equipment, and good housekeeping practices. With the implementation of these measures, the residual risk to on-site workers is considered low and manageable.

8.5.2.3 Traffic Emissions

There is the potential for traffic emissions to affect air quality in the long-term over the operational phase. The predicted operational phase traffic has been reviewed, and a detailed air quality assessment has been scoped out as none of the road links affected by the Proposed Development satisfy the TII scoping assessment criteria in Section 8.2.3.2.

It can be determined that the construction stage traffic will have a *direct, long-term, negative* and *imperceptible* impact on air quality and human health, which is overall not significant in EIA terms.

8.5.3 Potential Cumulative Effects

The EC *Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions*, defines cumulative effects as “*impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project*”. Effects which are caused by the interaction of effects, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the accumulation of different effects that are individually minor.

Cumulative air quality impacts have the potential to arise locally when operational activities associated with the Proposed Development take place at the same time as activities from other developments in a specific location.

A review of other off-site developments was completed as part of this assessment. Chapter 2 of this EIAR details the existing, proposed and granted planning permissions on record in the area, a review of these planning permissions has been completed as part of this assessment.

Assessment of road traffic emissions on air quality was based on traffic data that includes contributions from other existing and permitted developments on the surrounding road network, during both construction and operational phases. This approach ensures that cumulative traffic-related emissions have been accounted for in the modelling. The resulting impact on ambient air quality has been determined as not significant.

In conclusion, the assessment has considered cumulative effects arising from the interaction of the Proposed Development with other developments in the area. Based on the available data, mitigation measures, and modelling assumptions, no potentially significant cumulative effects on air quality have been identified.

8.5.4 “Do Nothing” Effect

If the infill does not proceed, air quality impacts would remain limited to the current operational footprint. Dust and vehicle emissions would not increase and may gradually decline as existing activities wind down, with no additional mitigation or monitoring required beyond what is already in place.

8.6 Avoidance, Remedial and Mitigation Measures

To minimise the potential risks of air quality impacts occurring during operations, a series of mitigation measures have been prepared and will be implemented. These measures are designed in accordance with best practice guidance, including the Institute of Air Quality Management (IAQM, 2016), and aim to reduce fugitive dust emissions, manage vehicle-related pollutants, and maintain site cleanliness. The measures are proportionate to the scale and nature of the Proposed Development and will be monitored regularly to ensure effectiveness.

Dust Suppression and Site Management

- Rotary atomisers, water bowsers and vapour mists will be used during dry weather and during any site preparation activities including overburden removal and excavation;
- Black, horticultural windbreaks will be established around the infilling area that are at least as high as stockpiled materials on site to capture any windblown dust that could be at risk from being blown towards sensitive receptors;
- Stockpiles will be designed and located to minimise exposure to prevailing winds and reduce the duration of storage;
- Exposed surfaces (e.g. topsoil and overburden mounds) will be vegetated or regularly dampened down to prevent dust lift-off;
- Drop heights during loading and unloading of materials will be minimised to reduce dust plumes; and
- Dust generating activities will be located away from sensitive receptors where possible and shielded by bunds or natural topography.

Vehicle and Machinery Controls

- Wheel washing facilities will be provided at site exits, with a surfaced road between the wash and the entrance to prevent track out;
- Loose loads of fine materials will be covered or sprayed prior to leaving the site;
- Internal haul roads will be compacted, graded, and maintained to reduce dust generation;
- Vehicle speeds will be restricted on site, and upswept exhausts will be used where applicable;
- Engine idling will be minimised; machinery will not be left running unnecessarily; and

All vehicles and equipment will be regularly maintained to reduce emissions.

Operation Controls and Monitoring

- Daily visual inspections will be carried out to assess fugitive dust levels. If elevated dust levels are observed, operations will be curtailed until conditions improve or corrective measures are implemented;
- The EPA national air quality forecast will be monitored, and operations will be adjusted during periods of elevated pollution;
- Dust deposition will be monitored using Bergerhoff gauges in accordance with VDI 2119 and TA Luft standards, where appropriate;
- A Dust Management Plan (DMP) will be maintained, outlining roles, responsibilities, monitoring protocols, and response procedures; and
- Staff will be trained in dust management procedures and mitigation responsibilities.

Road Perimeter Management

- A road sweeper will be used regularly on the site entrance and adjacent public roads to prevent dust accumulation;
- Landscaped mounds and screening bunds will be maintained around the site perimeter to reduce off-site dust dispersion; and
- Site layout will be reviewed periodically to ensure optimal shielding and minimal haul distances.

These mitigation measures will be implemented throughout the operational phase of the infill and reviewed regularly to ensure their continued effectiveness. By adopting a proactive and risk-based approach to dust and emissions management, the Proposed Development will remain compliant with ambient air quality standards and minimise the risk of nuisance or health-related impacts on nearby sensitive receptors. The measures outlined above reflect current best practice and demonstrate a commitment to environmental responsibility and regulatory compliance.

8.6.1 “Worst Case” Scenario

A worst-case scenario has been applied when considering the residual source emissions for the Disamenity Dust Assessment. It is expected that adequate mitigation measures, as outlined in Section 8.6, will assist in preventing nuisance dust from resulting in any significant effects. However, in the unlikely event that these measures fail or are temporarily ineffective, it is not considered that significant dust-related effects would occur due to the separation distance between dust-generating activities and sensitive receptors.

The traffic data used in the assessment includes projected volumes from the Proposed Development as well as existing and permitted off-site developments. This cumulative approach represents a worst-case scenario in terms of potential traffic-related air emissions. Despite this, the resulting traffic volumes remain below the thresholds set out in TII guidance for requiring detailed air quality modelling. As such, a detailed air quality assessment was scoped out, and the associated effects are considered not significant in EIA terms.

8.7 Residual Effects

No negative residual effects in the context of air quality are anticipated regarding the Proposed Development.

Table 8-19 Residual Dust Impacts Associated with the Proposed Development

Receptor	Description of the Effect	Sensitivity of Receptor	Magnitude of Impact	Effect (Pre-mitigation)	Mitigation measures	Residual Effect
Construction Phase						
N/A	N/A	N/A	N/A	N/A	N/A	N/A
Operational Phase						
SR1	Slight Adverse	High	Low	Slight Adverse	Dust suppression, vehicle and machinery controls, road perimeter management	Negligible
SR2	Not Significant	High	Negligible	Negligible	Negligible	Negligible
SR3	Not Significant	High	Negligible	Negligible	Negligible	Negligible
SR4	Not Significant	High	Negligible	Negligible	Negligible	Negligible
SR5	Not Significant	High	Negligible	Negligible	Negligible	Negligible

The traffic generated by the Proposed Development has been assessed for its effect on air quality and it has been determined to have an overall not significant effect in terms of local air quality.

Therefore, it is concluded that the Proposed Development will not give rise to any significant adverse residual effects in terms of air quality. The site is considered suitable for the Proposed Development from an air quality perspective.

8.8 Monitoring

Monitoring of dust emissions during the operational phase will be undertaken to ensure that dust-related effects are not experienced beyond the Proposed Development site boundary. Where required, dust deposition will be measured using the Bergerhoff Method, in accordance with VDI 2119 and the TA Luft standard.

This method involves placing Bergerhoff Dust Deposit Gauges at strategic locations along the site boundary for a period of 30 +/- 2 days. The selection of sampling point locations will be based on the requirements of VDI 2119, taking account of factors such as proximity to sensitive receptors, prevailing wind directions, and the presence of buildings or other obstructions. Gauges will be positioned at an appropriate height above ground level to ensure representative sampling.

At the end of the exposure period, the gauges will be removed, and the dust deposits will be analysed gravimetrically. Results will be expressed as a dust deposition rate in mg/m²/day in accordance with the TA Luft guideline limit for 350 mg/m²/day,

8.9 Interactions

Interactions between Air Quality and other aspects of this EIA are considered in this section of the chapter. This section has been informed by, and should be read in conjunction with,

other relevant chapters including Population and Human Health, Biodiversity, Land and Soils, Climate, and Traffic and Transport, to ensure a consistent and comprehensive assessment of potential interactions.

8.9.1 Population and Human Health

Interactions between air quality and population and human health have been considered as potential health-related impacts may arise from dust nuisance, including Respirable Crystalline (RCS) and traffic-derived pollutants.

Fine particulate matter containing RCS may be generated during dry handling and infilling activities. These particles pose a recognised occupational health risk, particularly for on-site workers. With the implementation of the mitigation measures outlined in Section 8.6, the residual risk to on-site workers is considered low and manageable.

The Disamenity Dust Assessment has concluded that there will be an overall negligible impact on sensitive receptors as a result of the Proposed Development. Nevertheless, appropriate mitigation measures will be incorporated to substantially reduce any likelihood of fugitive emissions causing an impact on sensitive receptors. These measures will ensure compliance with ambient air quality standards and protect human health.

Furthermore, traffic-related pollutants have been assessed and determined as having an overall insignificant effect, therefore air quality effects from the Proposed Development are not expected to have a significant effect on population and human health.

This chapter should be read in conjunction with Chapter 4 (Population and Human Health), to provide a comprehensive understanding of potential health-related interactions.

8.9.2 Biodiversity

Interactions between Air Quality and Biodiversity have been considered as the operational phase has the potential to interact with flora and fauna in adjacent habitats and designated sites due to dust emissions arising from the operational works. However, the mitigation measures employed at the Proposed Development will ensure that the impacts to flora and fauna are not significant.

This chapter should be read in conjunction with Chapter 5 (Biodiversity), to provide a comprehensive understanding of potential biodiversity related interactions.

8.9.3 Land and Soils

Interactions between air quality and land and soils have been considered, particularly in relation to dust deposition during the operational phase. Fugitive dust emissions may settle on exposed soil surfaces, potentially altering surface characteristics or contributing to minor changes in soil chemistry. However, given the nature of the material being extracted and the implementation of effective dust mitigation measures (see Section 8.6), the likelihood of dust accumulation at levels that would adversely affect soil quality is low.

In addition, site management practices, including topsoil handling, bunding, and phased excavation, will further reduce the potential for dust-related impacts on soil resources. As such, no significant air quality-related effects on land and soils are anticipated.

This chapter should be read in conjunction with Chapter 6 (Land and Soils), to provide a comprehensive understanding of potential land and soils related interactions.

8.9.4 Climate

Interactions between air quality and climate have been considered, particularly in relation to emissions of greenhouse gases (GHGs) and particulate matter during the operational phase of the Proposed Development.

Infilling activities, including the transport and infilling of materials, primarily generate coarse particulate matter (PM₁₀), which is associated with dust nuisance but does not significantly contribute to climate change. However, fine particulate matter (PM_{2.5}), including RCS may be generated during dry processing and handling. These finer particles are more relevant to human health than to climate impacts.

GHG emissions may arise from fuel combustion in mobile plant, machinery and vehicles. While these emissions are expected to be relatively low, they represent the primary air-quality related contribution to climate change from the Proposed Development.

Mitigation measures, as outlined in Section 8.6, including minimising engine idling, maintaining equipment and reducing haul distances, will help reduce fuel consumption and associated GHG emissions. These measures support broader climate objectives by improving operational efficiency and reducing the carbon footprint of the site.

Based on the nature and scale of the Proposed Development, and the mitigation measures proposed, no significant air quality-related effects on climate are anticipated.

This chapter should be read in conjunction with Chapter 9 (Climate), to provide a comprehensive understanding of potential climate related interactions.

8.9.5 Traffic

There can be a significant interaction between air quality and traffic. This is due to traffic-related pollutants that may arise during both the construction and operational phases. In the current assessment, traffic derived pollutants which may affect air quality have been deemed not significant. Therefore, the effect of the interaction between air quality and traffic is not significant for both the construction and operational phases of the Proposed Development.

This chapter should be read in conjunction with Chapter 13 (Traffic), to provide a comprehensive understanding of potential traffic related interactions.

8.10 Difficulties Encountered When Compiling

No difficulties have been encountered while compiling this chapter.

8.11 Conclusion

This chapter has considered the potential impacts from dust emissions, including RCS and traffic-related pollutants associated with the Proposed Development. With the implementation of best practice mitigation measures (as outlined in Section 8.6), the risk of dust and health related effects is considered negligible. Traffic emissions have also been assessed and found to be below threshold requiring detailed modelling. No significant air quality effects are anticipated.

8.12 References

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9 CLIMATE

9.1 Introduction

This chapter of the EIAR identifies, describes, and presents an assessment of the eventual significant direct and indirect effects of the Proposed Development at Kyletalesha, Portlaoise, Co. Laois on climate (for example greenhouse gas (GHG) emissions) and its vulnerability to climate change.

It should be read in conjunction with Ch. 8 Air Quality and Ch. 14 Material Assets Traffic and Transport.

A full description of the Proposed Development can be found in Chapter 2 of this EIAR.

Climate change is recognised as one of the most serious global environmental problems and arguably the greatest challenge facing humanity today. While natural variations in climate over time are normal, anthropogenic activities have interfered greatly with the global atmospheric system by emitting substantial amounts of greenhouse gases (GHGs). This has caused a discernible effect on our global climate system, with continued change expected due to current and predicted trends of GHG emissions. In Ireland this is demonstrated by rising sea levels, changes in the ecosystem, extreme weather events and biodiversity loss.

The GHG assessment evaluates the Proposed Development's climate impact across different life stages, considering a 50-year life expectancy. It categorises greenhouse gas emissions into four main stages based on BS EN 15978: Production (embodied carbon from raw material extraction to product manufacturing), Pre-construction/Construction (impacts from product delivery and assembly), Operational (emissions from operations), and End of Life (deconstruction and disposal activities). The assessment includes the first three stages, while the End-of-Life stage is excluded due to uncertainties in deconstruction methods.

Attention will be focused on Ireland's obligations under the Paris Agreement (Climate Action Plan & Corresponding carbon budgets) in the context of the overall climatic impact of the presence and absence of the Proposed Development.

9.1.1 Quality Assurance and Competency of Experts

The climate chapter of the EIAR has been prepared by Aoife Gillen of DNV, Aoife holds a Master of Science (Hons) degree, is a Chartered Environmental Health Practitioner, and Certified Energy Manager. Aoife has worked as a Principal Sustainability Consultant with DNV since March 2024.

BM Lynch Construction & Civils Limited utilised Transport Infrastructure Ireland's (TII) proprietary carbon tool to estimate carbon emissions associated with material delivery, soil removal, roads, and infrastructure which informed the carbon assessment for this Chapter.

9.2 Greenhouse Gas Emissions in Ireland

Ireland's latest GHG emissions 1990-2024 are based on the Sustainable Energy Authority Ireland's (SEAI's) provisional energy balance released in June 2025 (EPA, 2025). Total

national greenhouse gas emissions in 2024 (excluding LULUCF) are estimated to be 53.75 million tonnes carbon dioxide equivalent (Mt CO₂eq) which is 2.0% lower (or 1.09 Mt CO₂eq) than emissions in 2023 (54.85 Mt CO₂eq) and follows a 6.8% decrease in emissions reported for 2023. Emissions in 2024 are 3.6% lower than the historical 1990 baseline. National total emissions including Land Use Land Use Change and Forestry (LULUCF) decreased by 1.9% to 57.65 Mt CO₂eq. ETS4 and ESR emissions decreased by 7.4% and 0.5% respectively (EPA, 2025).

Arresting growth in emissions is a challenge in the context of a growing economy but one which must continue to be addressed by households, business, farmers, and communities if Ireland is to reap the benefits of a low-carbon economy.

The GHG emission inventory for 2024 is the fourth of ten years over which compliance with targets set in the European Union's Effort Sharing Regulation (EU 2018/842) will be assessed. This Regulation sets 2030 targets for emission reductions outside of the Emissions Trading Scheme (known as ESR emissions) and annual binding national limits for the period 2021-2030. Ireland's target is to reduce ESR emissions by 42% by 2030 compared with 2005 levels, with a number of flexibilities available to assist in achieving this. The ESR includes the sectors outside the scope of the EU Emissions Trading System (ETS) (such as Agriculture, Transport, Residential, Public Services and Commercial Services and Waste).

Ireland's ESR emissions annual limit for 2024 is 38.68 Mt CO₂eq. Ireland's provisional 2024 GHG ESR emissions are 42.42 Mt CO₂eq; this is 3.74 Mt CO₂eq more than the annual limit for 2024. This value is the national total emissions less emissions generated by stationary combustion, i.e., power plants, cement plant, and domestic aviation operations that are within the EU's emissions trading scheme. Cumulatively from 2021-2024 and after using the ETS flexibility, Ireland is not in compliance with the ESR by a net distance to target of -1.30 Mt CO₂eq. In 2024, there is an exceedance of 1.83 Mt CO₂eq above its Annual Emissions Allocation with the ETS flexibility. Agriculture and Transport accounted for 75.4% of total ESR emissions in 2024. The revised LULUCF Regulation (2023)¹⁰ incorporates new rules around LULUCF flexibilities for the period 2021-2025 and 2026-2030. There is a high degree of uncertainty relating to the availability of the LULUCF flexibility and, if available, the quantity of flexibility in each budgetary period (EPA, 2025).

The latest projections (May 2025) indicate that currently implemented measures (With Existing Measures) will achieve a reduction of 10% on 2005 levels by 2030, significantly short of the 42% reduction target. If measures in the higher ambition (With Additional Measures) scenario are implemented, EPA projections show that Ireland can achieve a reduction of 22% by 2030, still short of the 42% reduction target.

In terms of the 2030 targets, the ESR provides two flexibilities (use of ETS allowances and credit from action undertaken in the land use, land use change and forestry (LULUCF) sector) to allow for a fair and cost-efficient achievement of the targets. New Regulations in 2023 mean there are new rules around LULUCF flexibility that incorporates split budgets 2021-2025 to 2026-2030^[1]. Additional analyses are needed to estimate the impact of the new rules on flexibilities. In the interim, based on latest LULUCF inventory and projections data, the maximum amount of LULUCF flexibility now projected to be available is 13.4 Mt CO₂eq in the first 5-year period (or 2.68 Mt CO₂eq per annum), with no flexibility available in the second 5-year period.

Ireland's GHG (GHG) emissions increased in the period from 1990 to 2001 where it peaked at 70.85 Mt CO₂ equivalent, before displaying a downward trend to 2014. Emissions increased by 4.0% and 3.8%, respectively in the years, 2015 and 2016 and remained relatively stable in 2017 and 2018, followed by a 3.0% decrease in 2019. In 2020 total national GHG emissions were 3.6% lower than 2019 emissions largely driven by the covid restrictions. The gradual lifting of covid restrictions in 2021 along with an increase in the use of coal and less renewables within electricity generation resulted in a 4.5% increase in emissions in 2021 compared to 2020. A 2.1% decrease in emissions was seen in 2022 compared to 2021, mainly due to a substantial decrease in residential sector emissions combined with decreases from industry, agriculture and electricity generation. This was followed by a 6.8% reduction in emissions in 2023 and 2% in 2024 on 2023 levels. Ireland's GHG emissions have decreased by 3.6% from 1990-2024.

In relation to the GHGs; carbon dioxide (CO₂) accounted for 61.1% of the total, with methane (CH₄) and nitrous oxide (N₂O) contributing 28.9% and 8.8% as CO₂ equivalent, respectively and F-gases contributing 1.2% of the total as CO₂ equivalent.

Agriculture is the largest contributor to the overall emissions at 38.0% of the total (excluding LULUCF). Transport and Energy Industries are the second and third largest contributors at 21.7% and 13.3%, respectively. Residential and Manufacturing Combustion emissions account for 10.4% and 7.7%, respectively. These five sectors accounted for 91.1% of national total emissions in 2024. The remainder is made up by the Industrial Processes sector at 3.5%, F-Gases at 1.1%, Commercial Services at 1.4%, Public Services at 1.3% and Waste at 1.6%.

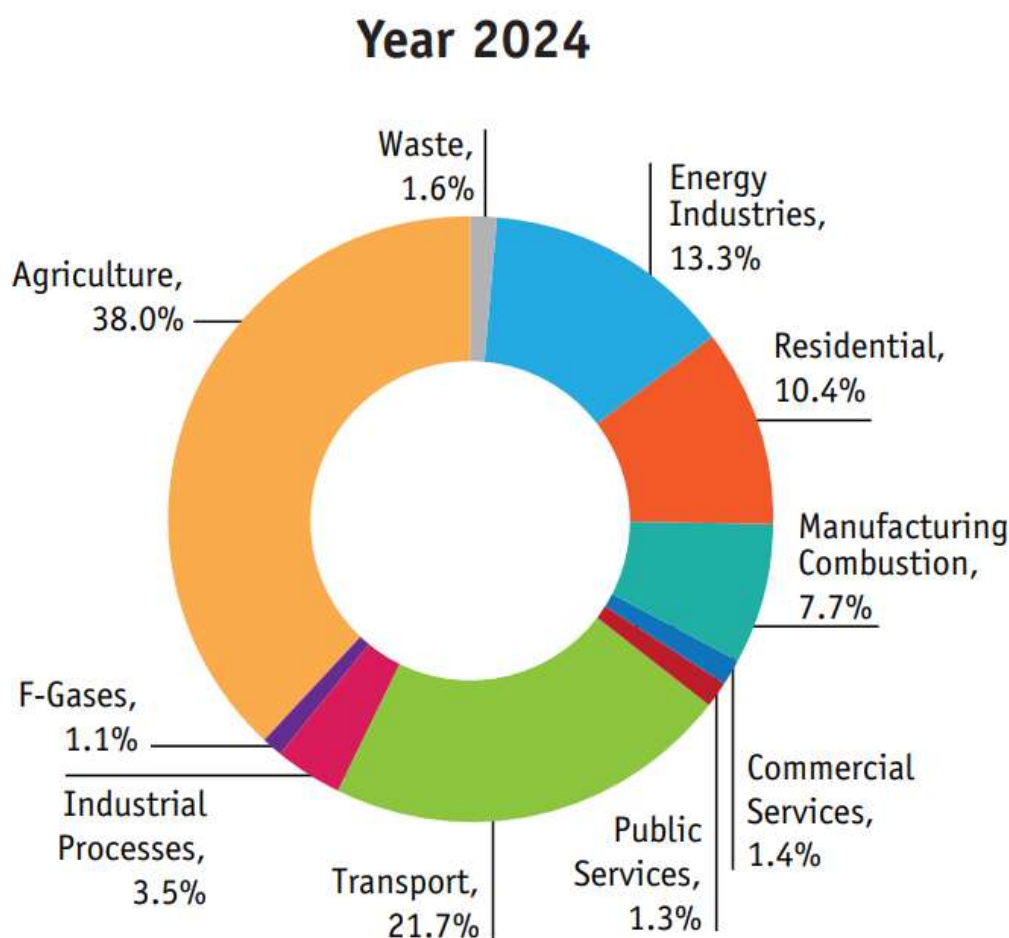


Figure 9-1 Ireland's Greenhouse Gas Emissions Share by Sector 2024 (Source: EPA, 2025)

The Climate Change Advisory Council submitted its latest Annual Review 2025 in a series of sectoral reports between March and July 2025, with the final update published on August 8, 2025. Detailed key messages, including observations and recommendations for each sector (electricity; transport; built environment; enterprise and waste; agriculture, forestry, and other land use; and biodiversity), can be found at the beginning of each chapter in the annual review (CCAC, 2025).

The overall recommendations are as follows:

- **Extreme Weather Preparedness:** The Council urges the Government to establish a National Climate Damage Register to monitor and record the economic, social, and environmental impacts of extreme weather events. This is essential to improve Ireland's readiness for future climate shocks.
- **Electricity Infrastructure Resilience:** Following severe disruptions from Storms Darragh and Éowyn, the Council recommends urgent investment in grid modernization and resilience planning for critical services such as water, telecoms, and transport.
- **Transport Sector Reform:**
 - A full review of transport taxation (including vehicle registration tax, motor tax, excise duty, carbon tax, fuel pricing, and distance-based charges) is needed to align fiscal policy with climate goals.

- Road space should be reallocated to support walking, cycling, and public transport.
- Planning reform must ensure new developments reduce transport demand and accelerate delivery of sustainable infrastructure.
- Local authorities need support to implement low-emission zones, shuttle services, and carpooling incentives.
- School transport must be expanded to reduce car journeys, with continued investment in walking and cycling initiatives.
- Agriculture and Land Use: The Council supports scaling up agri-environmental schemes like ACRES and implementing the National Biomethane Strategy to produce 1 TWh of renewable gas by 2025. Continued reductions in fertiliser use and methane emissions are essential.
- Energy Security and Fossil Fuel Phase-Out: The Council expresses serious concerns about fossil-powered data centres and LNG terminals. It recommends:
 - Halting new fossil fuel infrastructure approvals
 - Ensuring new data centre demand is met entirely by renewablesFull depreciation of fossil fuel assets by 2050, especially in the gas network

9.3 Legislation, Policy and Guidance

The key legislation and guidance referenced in the preparation of the EIAR is outlined in Chapter 1: Introduction (Sections 1.5, 1.6 and 1.7). Specific to Climate, the following legislation, guidance, and planning framework relevant to the consideration of this factor has informed the assessment as outlined below.

9.3.1 International Legislation/Commitments/Agreements

In March 1994, the United Nations Framework Convention on Climate Change (UNFCCC) was established as an intergovernmental effort to tackle the challenges posed by climate change. The Convention membership is almost universal, with 197 countries having ratified. Under the Convention, governments gather and share information on GHG emissions, national policies, and best practices. This information is then utilised to launch national strategies and international agreements to address GHG emissions. Following the formation of the UNFCCC, two major international climate change agreements were adopted: The Kyoto Protocol, and the Paris Agreement.

In April 1994, Ireland ratified the (UNFCCC) and subsequently signed the Kyoto Protocol in 1997. The Kyoto Protocol is an international agreement linked to the UNFCCC which commits its parties to legally binding emission reduction targets. In order to ensure compliance with the protocol, the Intergovernmental Panel on Climate Change (IPCC) has outlined detailed guidelines on compiling National GHG Inventories. These are designed to estimate and report on national inventories of anthropogenic GHG emissions and removals. Under Article 4 of the Kyoto Protocol, Ireland agreed to limit the net anthropogenic growth of the six named GHGs to 13% above the 1990 level, spanning the period 2008 to 2012 (IPCC, 2006).

The second commitment period of the Kyoto Protocol was established by the Doha amendment which was adopted in extremis on the 8th of December 2012, to impose quantified emission limitation and reduction commitments (QELRCs) to Annex I (developed country)

Parties during a commitment period from 2013 to 2020. 38 developed countries, inclusive of the EU and its 28 member states, are participating. Under the Doha amendment, participating countries have committed to an 18% reduction in emissions from 1990 levels. The EU has committed to reducing emissions in this period to 20% below 1990 levels. Ireland's QELRCs for the period 2013 to 2020 is 80% of its base year emissions. Ireland's compliance with the Doha amendment was assessed based on the GHG inventory submission in 2022 for 1990-2020 data. Ireland complied procedurally with its submission obligations under the Doha Amendment, by delivering a complete 1990–2020 inventory in 2022 and its submission has been considered acceptable. As of October 2020, the Doha Amendment has received the required number of ratifications to enter into force. Once in force, the emission reduction commitments of participating developed countries and economies in transition (EITs) become legally binding.

The Sustainable Development Goals (SDGs), also known as the Global Goals, were adopted by all United Nations Member States in 2015 as a universal call to action to end poverty, protect the planet, and ensure that all people enjoy peace and prosperity by 2030. The 17 SDGs are integrated—that is, they recognise that action in one area will affect outcomes in others, and that development must balance social, economic, and environmental sustainability. The creativity, knowhow, technology and financial resources from all of society is necessary to achieve the SDGs in every context. At its heart, the SDGs are about global partnership for this call to action. No matter how large or small, and regardless of their industry, all companies can contribute to the SDGs through their sustainability and corporate social responsibility strategies, policies, and processes.



Figure 9-2 UN Sustainable Development Goals (Source: [THE 17 GOALS | Sustainable Development](#))

Ireland has published a Sustainable Development Goals National Implementation Plan 2022-2024 to provide a whole-of-government approach to implementing these goals. Sustainable development, climate change and equity are intrinsically intertwined. Climate change impacts can be linked in one way or another to all 17 of the UN Sustainable Development Goals

(SDGs). Climate action that considers co-impacts across other SDGs can increase efficiency, reduce costs and support early and ambitious climate action (DECC, 2022). A new plan is in the initial stages of development and is expected to be published in the first half of 2026.

9.3.2 European Legislation

GHG Legislation

In December 2015, the Paris Climate Change Conference (COP21) took place and was an important milestone in terms of international climate change agreements. The Paris Agreement sets out a global action plan to put the world on track to mitigate dangerous climate change by setting a global warming limit not to exceed 2°C above pre-industrial levels, with efforts to limit this to 1.5°C. As a contribution to the objectives of the agreement, countries have submitted national climate action plans (nationally determined contributions, (NDCs)). Under this agreement, governments agreed to come together every 5 years to assess the collective progress towards the long-term goals and inform Parties in updating and enhancing their nationally determined contributions. Ireland will contribute to the Paris Agreement through the NDC tabled by the EU on behalf of Member States in 2020, which commits to a 55% reduction in EU-wide emissions by 2030 compared to 1990. This is considered to be the current NDC maintained by the EU and its Member States under Article 4 of the Paris Agreement.

The EU has set itself targets for reducing its GHG emissions progressively up to 2050, these are outlined in the 2020 climate and energy package and the 2030 climate and energy policy framework. These targets are defined to assist the EU in transitioning to a low-carbon economy, as detailed in the 2050 low carbon roadmap. The 2020 package is a set of binding legislation to ensure that the EU meets its climate and energy targets for the year 2020 (EEA; 2020). There are three key targets outlined in the package which were set by the EU in 2007 and enacted in legislation in 2009:

- 20% reduction in GHG emissions from 1990 levels;
- 20% of EU energy to be from renewable sources; and
- 20% improvement in energy efficiency.

The 2030 climate and energy framework builds on the 2020 climate energy package and was adopted by EU leaders in October 2014. The framework sets three key targets for the year 2030:

- At least 40% cuts in GHG emissions from 1990 levels;
- At least 32% share for renewable energy; and
- At least 32.5% improvement in energy efficiency.

The EU has acted in several areas in order to meet these targets, including the introduction of the Emissions Trading System (ETS). The ETS is the key tool used by the EU in cutting GHG emissions from large-scale facilities in the power, industrial, and aviation sectors. Around 45% of the EU's GHG emissions are covered by the ETS.

As part of the European Green Deal, the EU Commission proposed in September 2020 to raise the 2030 GHG emission reduction target, including emissions and removals, to at least 55% compared to 1990. The European Climate Law came into force in July 2021 and writes into law the goal set out in the European Green Deal for Europe's economy and society to

become climate-neutral by 2050. The law also sets the intermediate target of reducing net GHG emissions by at least 55% by 2030, compared to 1990 levels.

Corporate Sustainability Reporting Directive (CSRD)

On 5 January 2023, the Corporate Sustainability Reporting Directive (CSRD) entered into force. It modernises and strengthens the rules concerning the social and environmental information that companies must report. The CSRD is effective from 01 January 2024 for those entities already subject to the NFRD (reporting in 2025) and from 01 January 2025 for all other large companies (reporting in 2026).

Companies subject to the CSRD will have to report according to European Sustainability Reporting Standards (ESRS). The standards are developed in a draft form by the [EFRAG](#), previously known as the European Financial Reporting Advisory Group (EFRAG, 2024). Specifically, the findings may serve as an evidence base for EFRAG Standard ESRS E1 CLIMATE CHANGE.

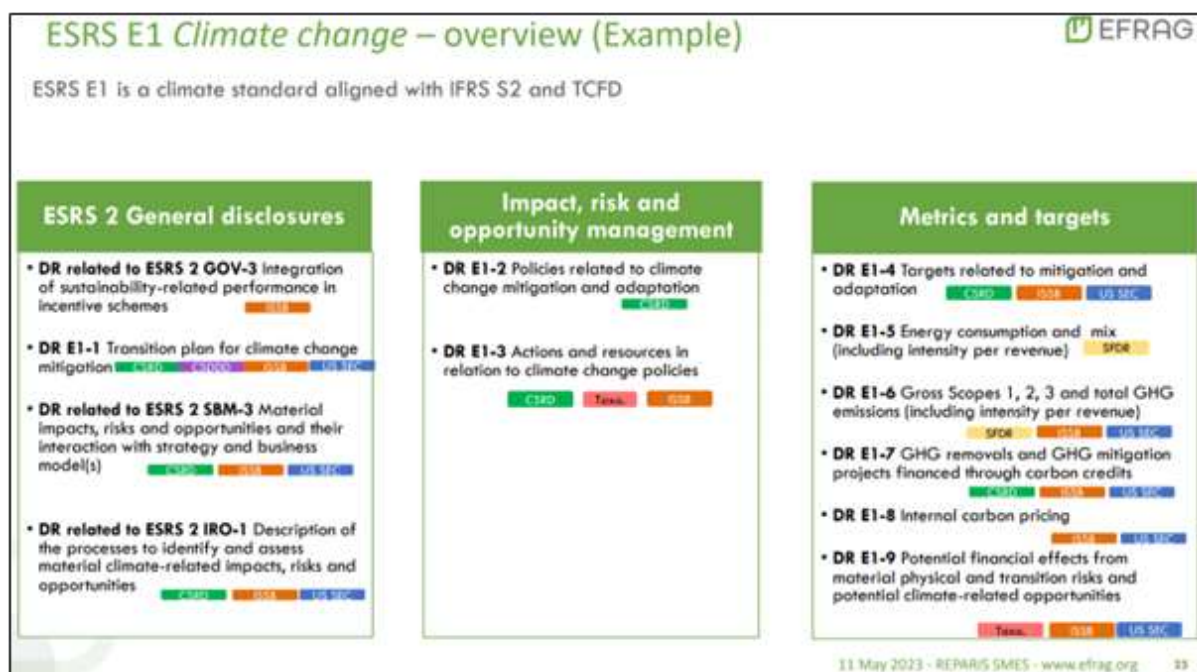


Figure 9-3 ESRS E1 Climate Change: presented by Eric Duvaud, EFRAG SR TEG member (Source: [The first set of ESRS – the journey from PTF to delegated act \(adopted on 31 July 2023\) – EFRAG](#))

The data/information from this Climate Chapter should be considered for Impact, Risk and Opportunity Management Disclosure Requirements 20 and 21 below within ESRS E1 CLIMATE CHANGE (EFRAG; 2023):

20. The undertaking shall describe the process to identify and assess climate-related impacts, risks and opportunities. This description shall include its process in relation to:

- (a) impacts on climate change, in particular, the undertaking's GHG emissions (as required by Disclosure Requirement ESRS E1-6);
- (b) climate-related physical risks in own operations and along the upstream and downstream value chain, in particular:

- i. the identification of climate-related hazards, considering at least high emission climate scenarios; and
- ii. the assessment of how its assets and business activities may be exposed and are sensitive to these climate-related hazards, creating gross physical risks for the undertaking.

(c) climate-related transition risks and opportunities in own operations and along the upstream and downstream value chain, in particular:

- i. the identification of climate-related transition events, considering at least a climate scenario in line with limiting global warming to 1.5°C with no or limited overshoot; and
- ii. the assessment of how its assets and business activities may be exposed to these climate-related transition events, creating gross transition risks or opportunities for the undertaking.

21. When disclosing the information required under paragraphs 20 (b) and 20 (c) the undertaking shall explain how it has used climate-related scenario analysis, including a range of climate scenarios, to inform the identification and assessment of physical risks and transition risks and opportunities over the short-, medium- and long-term.

Corporate Sustainability Due Diligence Directive (CSDDD)

This proposed Directive establishes a corporate due diligence duty. The core elements of this duty are identifying, bringing to an end, preventing, mitigating and accounting for negative human rights and environmental impacts in the company's own operations, their subsidiaries and their value chains. In addition, certain large companies must have a plan to ensure that their business strategy is compatible with limiting global warming to 1.5 °C in line with the Paris Agreement.

The CSDDD is expected to complement the CSRD as it will require companies to implement comprehensive identification, prevention and mitigation processes to eliminate adverse human rights and environmental impacts in the company's own operations, its subsidiaries and value chains. It will also complement the Taxonomy Regulation that requires specific details of what constitute "environmentally sustainable" investments.

It is expected that the CSDDD will require companies in scope to ensure the identification, prevention, mitigation and ability to account for any adverse environmental impacts, with adequate governance, management systems and measures in place to this end.

For instance, regarding adverse climate change impacts, a company would have to obtain quantitative and qualitative information about baseline conditions at higher risk sites or facilities. Identification of adverse impacts would include assessing the environmental context in a dynamic way and at regular intervals, prior to a new activity or relationship; prior to major decisions or changes in the operation; in response to or anticipation of changes in the operating environment; and periodically (at least every 12 months) throughout the life of an activity or relationship. The following Climate Change Impact Assessment can serve as due diligence demonstrating partial compliance with the CSDDD.

9.3.3 National Legislation

Climate Action and Low Carbon Development Act

The Climate Action and Low Carbon Development Act 2015 (the principal act) set national climate policy on a statutory footing for the first time in Ireland, with the target of pursuing the transition to a low-carbon, climate-resilient, and environmentally sustainable economy by 2050. The principal act was subsequently amended by the Climate Action and Low Carbon Development (Amendment) Act 2021 (the '2021 Act') which sets Ireland on a legally binding path to net-Zero emissions no later than 2050, and to a 51% reduction in emissions by the end of this decade (Government of Ireland; 2015).

The 2021 Act provides a legally binding framework with clear targets and commitments set in law, and ensures the necessary structures and processes are embedded on a statutory basis to ensure Ireland achieves its national, EU and international climate goals and obligations in the near and long term. Policy amendments will involve the rapid electrification of transport system: electric bikes, electric vehicles, and electric public transport. This will be enacted in tandem with a ban on new registrations of petrol and diesel cars from 2030. Furthermore, there will be a policy to incentivise behavioural changes by increased effective modal shift to walking, cycling and public transport infrastructure.

The 2021 Climate Act incorporates carbon budgets and sectoral emissions limits, defining the carbon budget as the total allowable GHG emissions during the budget period. Consequently, the Act has removed any mention of a national mitigation plan, replacing it with references to both former and latest versions of the Climate Action Plan, as well as a series of National Long Term Climate Action Strategies. Additionally, it has updated the national transition objective to a national climate objective, committing "to pursue and achieve, by no later than the end of the year 2050, the transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral economy" (Government of Ireland; 2022).

Section 6B(12) of the 2021 Climate Act requires the Minister for the Climate, Energy and the Environment to publish the approved carbon budget programme. In May 2022 the budgets were published and the total emissions allowed under each budget is set out below, as well as the average annual reduction for each 5-year period (DECC, 2022):

- 2021-2025: 295 Mt CO₂eq - this represents an average reduction in emissions of 4.8% per annum for the first budget period.
- 2026-2030: 200 Mt CO₂eq - this represents an average reduction in emissions of 8.3% per annum for the second budget period.
- 2031-2035: 151 Mt CO₂eq - this represents an average reduction in emissions of 3.5% per annum for the third provisional budget.

To meet these targets, the government published a set of Sectoral Emissions Ceilings in July 2022 and the agriculture sector has been assigned a % reduction on the 2018 baseline to achieve a ceiling of 25% reduction on the 2018 baseline (23 Mt CO₂eq) to achieve a ceiling of 106 Mt CO₂eq by 2025 and 96 Mt CO₂eq by 2030 (DECC, 2022).

The assessment in this chapter has been prepared in accordance with, among other things, the 2021 Act and the EIA Directive.

The 2021 Act also introduces a requirement for each local authority to prepare a Climate Action Plan, which will include both mitigation and adaptation measures and be updated every five years. Local authority Development Plans will also align with their Climate Action Plan (DECC, 2021).

The Proposed Development is consistent with the following plans, strategies and objectives specified in section 15 of the Climate Action and Low Carbon Development Act 2015, as amended:

- The National Climate Objective;
- The most recent Climate Action Plan;
- The most recent National Long-Term Climate Action Strategy;
- The most recent National Adaptation Framework; and
- The objective of mitigating GHG emissions and adapting to the effects of climate change in the State.

The Act mandates the relevant Minister to develop the Climate Action Plan, the National Long-Term Climate Action Strategy, and the National Adaptation Framework to achieve the National Climate Objective (DECC, 2021). This objective of becoming 'climate neutral' by 2050 aligns with the EU's climate goal as established in Regulation (EU) No 2021/1119 (the 'European Climate Law'). The European Climate Law enshrines into EU legislation the target set by the European Green Deal for the EU to attain climate neutrality, or 'net zero' GHG emissions, by 2050.

The Climate Action Plan 2025 (CAP25) is the fourth annual update to Ireland's Climate Action 2019 (the plans are to be updated annually to ensure alignment with Ireland's legally binding economy-wide carbon budgets and sectoral ceilings) (DECC; 2023). This plan is the third to be prepared under the Climate Action and Low Carbon Development (Amendment) Act 2021, and following the introduction, in 2022, of economy-wide carbon budgets and sectoral emissions ceilings. The plan had a delayed launch on April 15th, 2025.

The plan implements the carbon budgets and sectoral emissions ceilings and sets out a roadmap for taking decisive action to halve our emissions by 2030 and reach net zero no later than 2050, as committed to in the Programme for Government. Climate Action Plan 2025 builds on Climate Action Plan 2024, outlining how Ireland will accelerate the actions required to respond to the climate crisis, putting climate solutions at the centre of Ireland's social and economic development (DECC; 2025). Climate Action Plan 2025 is a streamlined Climate Action Plan, to be read in conjunction with Climate Action Plan 2024. It is also the final Climate Action Plan of the first 5-year Carbon Budget – marking an important midpoint in what has been called the decade of climate action.

The supplementary Annex of Actions, approved by the Irish Government, provides the specific actions required to implement the targets set out in the Plan, and includes information regarding outputs, lead departments, timelines and stakeholders. For 2025 a similar approach to the 2024 Annex has been implemented that will see only new, high-impact actions included in the Annex, while the full roadmap of actions to support the delivery of our climate targets remains within the Climate Action Plan itself (DECC; 2025).

9.3.4 National Policy

National Adaptation Framework (NAF)

Ireland's second statutory National Adaptation Framework (NAF) was published on 5 June 2024 by Minister Eamon Ryan TD, replacing the original 2018 framework following its mandated five-year review under the Climate Action and Low Carbon Development Act 2015 1 2 3. The updated NAF continues to set out the national strategy to reduce the country's vulnerability to climate change impacts and to avail of potential benefits, while integrating lessons learned from recent extreme weather events and evolving climate science.

The 2025 NAF builds on the foundational work of the National Climate Change Adaptation Framework (NCCAF, 2012) and the first NAF (2018), but introduces several new principles and priorities:

- Avoiding maladaptation
- Nature-based Solutions
- Just Resilience (an evolution of the "just transition" concept)
- Greater consideration of socio-economic vulnerability
- Improved cross-sectoral cooperation

The framework maintains its whole-of-government and society approach, emphasizing collaboration with civil society, the private sector, and the research community. It also strengthens the enabling environment for adaptation through updated sectoral planning guidelines and local authority strategies.

Under the 2025 NAF all government departments must prepare or update Sectoral Adaptation Plans for priority areas, including two newly added sectors: Tourism and Built Environment/Planning. Local authorities continue to develop Local Adaptation Strategies, supported by new guidance documents such as the Heritage and Climate Adaptation Guidance for Local Authorities.

In terms of integration with broader climate policy the NAF is closely aligned with CAP25, approved in April 2025, which refines Ireland's roadmap to halve emissions by 2030 and reach net zero by 2050. CAP25 includes a focused Annex of Actions for 2025 and cross-cutting measures in energy, buildings, transport, enterprise, land use, and adaptation.

The National Climate Change Risk Assessment (NCCRA)

The National Climate Change Risk Assessment (NCCRA) was published in May 2024 (EPA, 2024). The NCCRA was required to be developed under Action 457 from the 2021 CAP (Government of Ireland 2021). Action 457 seeks to

"Further develop Ireland's national climate change risk assessment capacity to identify the priority physical risks of climate change to Ireland".

The NCCRA uses definitions of the risk determinants from the Intergovernmental Panel on Climate Change (IPCC) Risk Framework (IPCC 2023):

- Hazard – the potential occurrence of a natural or human-induced physical event or trend or physical impact that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems, and environmental resources.

- Exposure – the presence of people, livelihoods, species or ecosystems, environmental functions, services, and resources, infrastructure, or economic, social, or cultural assets in places and settings that could be adversely affected.
- Vulnerability – the propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts including sensitivity.
- Risk – the potential for adverse consequences for human or ecological systems.

When considering risk, the NCCRA assesses exposure and vulnerability for two future climate change scenarios or Representative Concentration Pathways (RCPs):

- RCP4.5 was selected as it represents a scenario aligned with the global temperature trajectory.
- RCP8.5 was selected as it represents a high-emissions scenario and achieves the highest level of modelled temperature increases by the end of the century. Consequently, this scenario will result in the highest level of physical risk for Ireland, and therefore the greatest requirement for adaptation.

These scenarios align with a conservative approach to the assessment of risks to Ireland and assume that global emission reduction targets are not met. This aligns with the principle of precaution as stated in the NAF (DECC 2024). In addition to the future climate scenarios, the NCCRA assesses the risk from the future climate during the following timeframes:

- Present (~2030);
- Medium term (~2050); and
- Long term (~2100).

Just Transition

The 2021 Climate Action Plan sets out a just transition framework consisting of four principles to underpin both processes and implementation of all climate action policies and measures. Provisions under the 2021 CAP have been carried over to CAP25 without substantive changes. The present report primarily examines the impact of climate change (Government; 2021). However, we recommend that due consideration be given to the concept of a "just transition," aligning with the Irish Government's framework, to ensure a comprehensive approach to addressing the climate crisis that extends beyond mere climate action.

The just transition framework is made up of four principles (DECC; 2021):

- An integrated, structured, and evidence-based approach to identify and plan our response to just transition requirements.
- People are equipped with the right skills to be able to participate in and benefit from the future net zero economy.
- The costs are shared so that the impact is equitable and existing inequalities are not exacerbated.
- Social dialogue to ensure impacted citizens and communities are empowered and are core to the transition process.

Regional Policy

Action 8 of Ireland's second statutory National Adaptation Framework (NAF), published on 5 June 2024, reaffirms the establishment of four Climate Action Regional Offices (CAROs) to support climate adaptation at the local level 1 2. The Eastern & Midlands CARO remains one

of these offices, with a continued mandate to assist local authorities in its region in preparing and implementing Local Authority Climate Action Plans (LACAPs).

Under the updated NAF and the Climate Action Plan 2025 (CAP25), CAROs play a critical role in:

- Capacity building within local government
- Mainstreaming adaptation into planning and development
- Facilitating cross-sectoral collaboration
- Supporting alignment with national climate objectives and sectoral adaptation plans

The Eastern & Midlands CARO specifically supports councils such as Meath, Louth, Dublin City, Fingal, South Dublin, and Dún Laoghaire-Rathdown, ensuring that their climate action plans reflect the latest national strategies and regional vulnerabilities.

This updated framework emphasises Just Resilience, nature-based solutions, and community empowerment, aligning with the broader just transition principles carried forward from CAP21 into CAP25.

9.3.5 Laois Council Climate Action Plan 2024-2029

In January 2024, Laois CC adopted the Laois City Council Climate Action Plan 2024-2029 (Laois CCAP). The Action Plan is the climate adaptation and mitigation strategy for the County, and sets out to achieve, by no later than the end of 2050, the transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral County. Aligned to the Government's National Climate Objective (as set out in the national Climate Action Plan 2025), the new Plan outlines mitigation and adaptation climate action measures across the following six thematic areas:

- Governance and Leadership
- Energy and Built Environment
- Communities Resiliency and Transition
- Environment and Biodiversity
- Transport and Mobility
- Sustainability and Resource Management

The actions in these themes collectively address the main goals and targets of this plan:

1. 50% improvement in Laois CC's energy efficiency by 2030
2. 51% reduction in Laois CC's GHG emissions by 2030
3. To make Laois a climate resilient region for all, by reducing the impacts of future climate change-related events;
4. Empower the local community to engage with climate action through education, support, and ongoing collaboration and;
5. Enable socio-economic growth, placemaking and community development aligned to decarbonisation and a just transition.

The Plan sets out how Laois CC will be responsible for enhancing climate resilience, increasing energy efficiency and reducing GHG emissions across its own assets, services and infrastructure to which it is fully accountable for.

In the development of the CAP, Laois CC has reviewed the risks posed by climate change for the County and the implications of these risks for the delivery of services by Laois CC. This has been achieved through a Climate Change Risk Assessment (CCRA) which identifies the likelihood of future climate hazards and their potential impacts. The CCRA has been undertaken, in accordance with 'Technical Annex B: Climate Change Risk Assessment' of the 'Local Authorities Climate Action Planning Guidelines'.

A qualitative CCRA supports the identification and prioritisation of potential future climate risks for more detailed analysis and provides a broad understanding of where adaptation actions could be required. The approach comprises of two phases, where both current and future risks and impacts are assessed.

9.3.6 Laois County Development Plan (CDP) 2021-2027

The Laois CDP sets out the policy objectives and the overall strategy for the proper planning and sustainable development of the County over the plan period from 2021 to 2027.

The Climate Action & Energy chapter of the plan (Chapter 3) sets out detailed policy objectives in relation to climate action and the role of planning in climate change mitigation, climate change adaptation, and the transition towards a more climate resilient County. The Chapter addresses four key issues, namely:

- Energy Efficiency in Buildings;
- Renewable Energy;
- Decarbonising Motorised Transport;
- Agriculture, Land Management, Forestry, and Urban Greening.

These issues have been identified as being of particular significance in helping to achieve sustainable planning outcomes which will ultimately help to deliver a low carbon and a climate resilient County. Planning already plays a role in each of the key areas identified in the Laois CAP. Having regard to the headings set out in the Laois CAP, the Development Plan contains a range of policy objectives which aim to mitigate and adapt to climate change.

The creation of a climate resilient County is an overarching strategic outcome of the Laois CDP, and as such, the theme permeates the entire plan with a selection of policy objectives in multiple Chapters all contributing to aid in the transition of the County to a climate resilient low carbon society⁵. Relevant policy objectives and their incorporation into the Proposed Development design have been considered in Section 6 of this report.

The Laois Climate Action Plan (2024-2029) aims to create a cleaner, greener, and more resilient county. The Climate Action Plan has 173 specific actions that have either been delivered, are in development stage or drafted for the future implementation. For instance, Laois County Council has already begun, demonstrating early progress in decarbonising local transport and supporting sustainable mobility through the successful rollout of the BOLT electric bike rental scheme in Portlaoise, fulfilling the Plan's commitment to introduce bike-share schemes in larger urban centers. Since its launch, the scheme has facilitated over 20,000 trips covering more than 43,000 kilometres, highlighting strong community uptake and measurable movement towards low-carbon travel. The initiative forms part of a wider programme to expand shared cycling infrastructure to Portarlinton, Mountmellick, and

Graigucullen by 2029, further embedding active travel as a core component of climate mitigation efforts across the county. Laois County Council are also assisted by the Office of Public Works on flood alleviation schemes.

County Laois contains extensive areas of former and degraded peatland, and the Laois County Development Plan 2021–2027 highlights the importance of restoring land where feasible to improve carbon sequestration, ecological integrity, and long-term climate resilience.

In this context, the Proposed Development supports county-level climate objectives by returning previously disturbed land to a more natural and multifunctional condition. The controlled placement of locally sourced surplus soil will improve ground stability, enhance landform, and facilitate future beneficial uses of the site. While not constituting peatland rehabilitation, the approach is consistent with the broader sustainability and land-use priorities set out in regional climate and development policy.

Restoring the land to a more natural state provides several co-benefits, including improved site drainage, enhanced potential for biodiversity, and the creation of a landscape capable of supporting amenity, agricultural, educational, or ecological functions in the long term. These outcomes complement national decarbonisation pathways by contributing indirectly to carbon sequestration and supporting climate-resilient land use.

BM Lynch Construction & Civils Ltd. is committed to implementing sustainable practices throughout the operational phase to minimise climate impacts. Key initiatives include:

- **Enhanced Resource Efficiency:** The Proposed Development facilitates the reuse of surplus excavated soil generated at nearby construction sites. By directing materials to a designated application area, the need for long-haul transport and the extraction of additional primary resources is reduced.
- **Environment and safety enhancements:** Shorter haul distances for HGVs improve environmental performance and road safety by avoiding unnecessary heavy-vehicle travel through towns and rural communities.
- **Carbon Benefits from Carbon Rehabilitation:** Returning the land to a natural condition may support carbon uptake over time, contributing indirectly to carbon sequestration objectives outlined in the Climate Act 2021 and related policy frameworks.
- **Pollution control measures:** Best-practice construction and site-management protocols will be implemented to prevent runoff or contamination of groundwater, surface water ditches, and stormwater systems.
- **Road Cleanliness:** Wheel wash facilities and road sweepers will be used to ensure that soil, mud, and debris are not transferred onto the public road network.

A primary long-term outcome of the Proposed Development will be the rehabilitation of the land, improving its suitability for a range of potential future uses, including amenity, biodiversity enhancement, or educational activities. These improvements support the county's broader environmental objectives and align with its climate-resilient land-use strategies.

9.3.7 Guidance

The assessment has referred to national guidelines, where available, in addition to international standards and guidelines relating to the assessment of GHG emissions and associated climatic impact. These are summarised below:

- 2030 Climate and Energy Policy Framework (European Commission, 2014)
- 2030 EU Climate Target Plan (European Commission, 2021b)
- Assessing GHG Emissions and Evaluating their Significance the Institute of Sustainability & Environmental Professionals (ISEP formerly known as IEMA), 2022)
- Carbon Management in Infrastructure (European Commission, 2013)
- Climate Action and Low Carbon Development Act 2015 (as amended).
- Climate Action Plan 2025 (Government of Ireland, 2025)
- Design Manual for Roads and Bridges (DMRB) Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 14 LA 114 Climate (UK Highways Agency, 2019)
- Department of Housing, Planning, and Local Government. Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018)
- European Commission. Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (2013)
- European Commission. Technical Guidance on the Climate Proofing of Infrastructure in the Period 2021-2027 (2021a)
- ISEP. EIA Guide to: Climate Change Resilience and Adaptation (2020a)
- ISEP. GHG Management Hierarchy (2020b)
- ISEP. Environmental Impact Assessment Guide to: Assessing GHG Emissions and Evaluating their Significance (2022)
- Publicly Available Specification (PAS) 2080: 2016
- Transport Infrastructure Ireland (TII). GE-ENV-01106: TII Carbon Assessment Tool for Road and Light Rail Projects and User Guidance Document (2022c)
- Transport Infrastructure Ireland (TII). GE-GEN-01101: Guide to the Implementation of Sustainability for TII Projects (2023)
- Transport Infrastructure Ireland (TII). PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document (2022a)
- Transport Infrastructure Ireland (TII). PE-ENV-01105: Climate Assessment Standard for Proposed National Roads (2022b)
- Integrating Climate Change into Strategic Environmental Assessment in Ireland – A Guidance Note (EPA, 2015)

9.4 Study Methodology

Carbon dioxide (CO₂) emissions have a global climate warming effect. This is regardless of rate of release, location or the weather when released into the atmosphere. This is unlike pollutants that affect local air quality where the rate of release, location and prevailing weather, as well as the amount of pollutant, determines the local concentrations and the impact.

Local ambient concentrations of CO₂ are not relevant for climate change and there are no limits or thresholds that can be applied to particular sources of carbon emissions. Any amount of CO₂ released into the atmosphere will contribute to climate warming, the extent of which is determined by the magnitude of the release. Although CO₂ emissions are typically expressed as kilogrammes or tonnes per year, there is a cumulative effect of these emissions because CO₂ emissions have a warming effect which lasts for 100 years or more.

In this regard, the methodology adopted in this chapter covers two separate assessments – a GHG assessment (GHGA) and a climate change risk assessment (CCRA).

- GHG Emissions Assessment (GHGA) – This evaluation estimates the GHG emissions generated by a project throughout its entire lifespan. It then compares these emissions against pertinent Irish carbon budgets, targets, and policies to help gauge their significance.; The Transport Infrastructure Ireland (TII) Carbon assessment tool
- Climate Change Risk Assessment (CCRA) – This analysis examines how a changing climate could affect a project and its surrounding environment. The assessment considers a projects vulnerability to climate change and identifies adaptation measures to increase project resilience.

Further details on the methodologies undertaken are presented in the following paragraphs.

9.5 Study Area

Effects arising from the potential impacts on climate are considered to impact on a national to EU to global level and the study area for climate is the State for both the construction and operation phases. The Proposed Development description has been outlined in Chapter 2.

9.6 Survey Methodology

9.6.1 Desk Survey

A desktop study involving various national and international documents on climate change and analysis of synoptic meteorological data from the nearest Met Eireann station (Casement) was also carried out in order to compile this report. Attention has been focused on Ireland's obligations under the Paris Agreement in the context of the overall climatic impact of the presence and absence of the Proposed Development.

This analysis was undertaken by means of a desktop assessment based on available relevant guidance and information sources, and with reference to other chapters of this EIAR.

The following information sources have been consulted in relation to the assessment of climate aspects for the Proposed Development:

- Traffic figures from Traffic and Transportation;
- GHG assessment for construction and operational life stage;
- Estimates of likely waste volumes from the description of the Proposed Development presented in Project Description, Construction Strategy, Land and Soils and Resource and Waste Management of this EIAR; and
- Environmental Protection Agency (EPA) GHG Emissions Inventories and Projections.

9.6.2 Climatics

Summary of the Approach

This DNV assessment was primarily based on the on-site climate risk projections generated CMIP5/CMIP6 climate model. The tool is typically used in combination with multiple Shared Socio-economic pathways/ Representative Concentration Pathways (SSPs/RCPs), which represent different future GHG concentration trajectories developed by the International Panel on Climate Change. The assessment was undertaken for two representative scenarios SSP1-2.6/RCP 4.5 and SSP5-8.5/RCP 8.5:

- SSP1-2.6/RCP 4.5 (transition from 2030) – this scenario leads to global warming exceeding 2 °C by 2100 but remaining below 3 °C. It is described as an intermediate scenario; and
- SSP5-8.5/RCP 8.5 (business as usual) – this scenario leads to global warming significantly exceeding 3 °C by 2100 and is generally taken as the basis for the worst-case climate change scenarios.

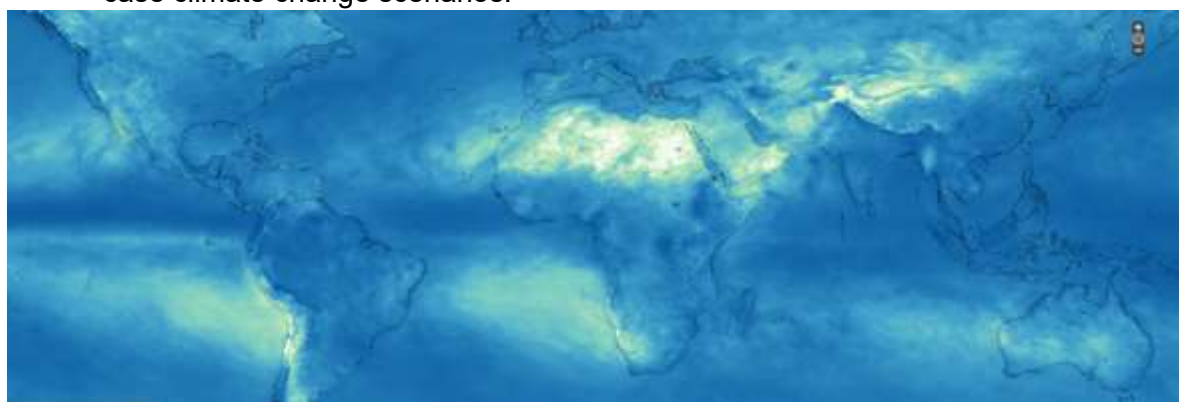


Figure 9-4 Multi-model Ensembled Rainfall Projection for 2050 (SSP5-8.5)

We combine the global data from multiple IPCC models (ACCESS, GFDL-ESM4, HadGEM) to address the model uncertainty. Figure 9-4 showcases the multi-model ensembled of rainfall projection for 2050 under SSP5-8.5 scenario. Through DNV's proprietary method, we downscale and refine the global data to a 5km grid resolution for various regions like Australia, Contiguous United States (CONUS), Europe, and the United Kingdom. Leveraging these refined datasets, we can assess multi-hazard risk exposure for assets and portfolios across different geographical areas. R3 G93 B123

Table 9-1 Assessment of climate risk indices

Category	Hazard
Temperature related indices	Surface temperature
	Warm Days
	Fire Weather Days
	Heat Stress Index
Rainfall related extremes	Precipitation
	Heavy Precipitation Days
	Extreme Precipitation Days
	Flood Events
Aridity/Drought conditions	Water stress
Irradiance at surface	Surface reading solar radiation

Cloud related	Cloud cover
Wind extremes	Wind speed
	Storm wind speed
Subsidence and landslide	Subsidence susceptibility index
	Landslide
Hailstorm	Hailstorm frequency
Lightning	Lightning density

9.6.3 Field Surveys

No site-specific baseline surveys were undertaken as part of the assessment for climate. The baseline data presented in this section is derived from the EPA Projections and Met Éireann monitoring network and may be taken as representative of the background climate within the Study Area.

9.6.4 Assessment Methodology

9.6.4.1 Key Parameters for Assessment

This assessment has been undertaken in line with the Institute of Sustainability & Environmental Professionals (ISEP formerly known as IEMA) guide 'Assessing GHG Emissions and Evaluating their Significance', 2nd Edition, 2022. The following aspects of the Proposed Development are assessed in this chapter:

- Potential direct GHG (GHG) emissions associated with the construction of the Proposed Development – this includes site clearance, embodied carbon, material transport, infilling activities and waste management;
- Potential changes in GHG emissions associated with emissions during the operational phase of the Proposed Development; and
- Vulnerability of both the construction and operational phases of the Proposed Development to climate change.

9.6.4.2 GHG Appraisal Method – Construction Phase

(Including Material Delivery and Spoil Removal)

The GHG assessment accounts for various components relating to the Proposed Development during different life stages to determine the total impact of the development on climate. The life expectancy for the purposes of the assessment is 50 years, typical for this type of development. GHG emissions are attributed to four main categories, taken from BS EN 15978. These categories are:

- Production Stage (Embodied carbon); The carbon emissions at this stage originate from the extraction of raw materials, their transportation to manufacturing sites, and the primary energy consumed (along with the associated carbon impacts) during the conversion of these raw materials into construction products. These phases have been included in the scope of this assessment, and relevant information has been integrated into the TII tool (TII, 2022).

- Pre-construction/Construction Stage; These carbon impacts stem from the delivery of construction products to the site. This aspect has been incorporated into the assessment's scope.
- Operational Stage: This encompasses a broad range of sources, including GHG emissions from operations (energy), maintenance, and replacement which have been included in this assessment.
- End of Life Stage: The sustainable disposal of waste the end of its life (Approx 50 years) consider the activities carried out by demolition contractors on-site. However, no credit is given for potential future carbon benefits from reusing or recycling materials into new products. This stage is not included in the scope of this study due to the variability and uncertainty surrounding deconstruction methods that may be employed at the end of the development's lifespan.

BM Lynch Construction & Civils Limited utilised the Transport Infrastructure Ireland's (TII) proprietary carbon tool to quantify carbon emissions such as material delivery and roads. The carbon tool is a spreadsheet-based product, developed by TII, with the goal of identifying, estimating and mitigating GHG emissions that accrue on large road and rail infrastructure projects. The carbon tool is closely aligned with guidance set out in PAS 20803 which suggests a modular structure for capturing and reporting carbon emissions according to lifecycle phase. Where the exact material needed isn't listed an estimate to a similar material type has been used. The construction waste and construction traffic information were reviewed from the traffic and waste chapters.

Design data for materials, earthworks and transport distances are based on input data from the design team. Where detailed designs are not available for various parts of the Proposed Development, assumptions are made based on industry best practice and default values in the carbon tool. In particular, transport distances for materials have been estimated. This allows for an estimate of transport emissions, using an emissions factor for kg CO₂eq/km in the carbon tool.

As the TII Carbon Tool was developed for road and infrastructure projects, the material types within the tool are specific to these types of developments. For this reason, solely the TII carbon tool was used to quantify carbon data, as the proposed development does not include any building elements.

9.6.4.3 GHG Appraisal Method - Operational Phase

Traffic Emissions

As per the EU guidance document Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Commission, 2013) the climate baseline is first established by reference to EPA data on annual GHG emissions (see Section 9.7 below). Thereafter the impact of the Proposed Development on climate is determined. Emissions from road traffic associated with the Proposed Development have the potential to emit carbon dioxide (CO₂) which will impact climate.

The UK Highways Agency has published an updated DMRB guidance document in relation to climate impact assessments LA 114 Climate (UK Highways Agency, 2019). The following scoping criteria are used to determine whether a detailed climate assessment is required for a proposed project during the operational stage. During the operational phase, if any of the

road links impacted by the Proposed Development meet the below criteria then further assessment is required.

- A change of more than 10% in AADT;
- A change of more than 10% to the number of heavy duty vehicles; and
- A change in daily average speed of more than 20 km/hr.

The AADT will not increase by more than 10% nor will a change in average speed limit of more than 20km/hr occur in any of the road links as a result of the proposed development.

However, Heavy-Goods Vehicles (HGV) shall increase from 54 to 65 in the opening year (2027), an increase of 8 no. HGVs or 15%. As a result, a detailed assessment of traffic related CO₂ emissions was conducted see table 9-2 below. PE-ENV-01104 (TII, 2022a) advises that road traffic related emissions information should be obtained from an Air Quality Practitioner to show future user emissions during operation without the development in place. The Air Quality Practitioner calculated the traffic related emissions through the use of the TII REM tool (TII, 2022b) which includes detailed fleet predictions for age, fuel technology, engine size and weight based on available national forecasts. The output is provided in terms of CO₂eq for the Opening Year 2027 and Design Year 2032. Both the Do Nothing and Do Something scenarios are quantified to determine the degree of change in emissions as a result of the Proposed Development. Traffic data was obtained from Traffic Consultants for the purpose of this assessment. Inputs include light duty vehicle (LDV) annual average daily traffic movements (AADT), annual average daily heavy-duty vehicles (HDV AADT), annual average traffic speeds, road link lengths, road type, and project county location. Further details are provided in Chapter 8 Air Quality.

Table 9-2 Assessment of Traffic Emissions

Year	Scenario	CO ₂ eq (tonnes/annum)
2027	Do Nothing	19.61
2027	Do Something	20.20
2032	Do Nothing	16.10
2032	Do Something	16.29
Increment in 2026		0.59
Increment in 2041		0.19

Operational GHG Emissions

The EU guidance (2013) also states indirect GHG emissions as a result of a development must be considered, this includes emissions associated with energy usage. In addition to the EU guidance, the ISEP guidance note on 'Assessing GHG Emissions and Evaluating their Significance' (ISEP, 2022) states that "the crux of significance regarding impact on climate is not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050". Mitigation has taken a leading role within the guidance compared to the previous edition published in 2017. Early stakeholder

engagement is key and therefore mitigation should be considered from the outset of the project and continue throughout the project's lifetime in order to maximise GHG emissions savings.

9.6.4.4 Assessment Criteria for GHG Emissions

After the publication of the 2021 Climate Amendment Act in July 2021 and the 2021 CAP, the carbon budgets were approved and a series of sectoral emissions ceiling were published, including sectoral emissions ceilings for the waste sector which remain the same under CAP25 (DECC, 2021). These ceilings will allow a comparison with the net CO₂ projected GHG emissions from the Proposed Development.

The ISEP Climate Change principles (ISEP, 2020) document provides a section on how to assess GHG emissions in EIA and states:

- "When evaluating significance, all new GHG emissions contribute to a significant negative environmental effect; however, some projects will replace existing development that have higher GHG profiles. The significance of a project's emissions should therefore be based on its net impact, which may be positive or negative.
- "Where GHG emissions cannot be avoided, the EIA should aim to reduce the residual significance of a project's emissions at all stages."
- "Where GHG emissions remain significant but cannot be farther reduced... approaches to compensate the project's remaining emissions should be considered."

The process for determining the significance of effects involves two key steps: first, defining the magnitude of the impacts, and second, evaluating the sensitivity of the receptors (e.g., Ireland's National GHG targets). Although there are no specific project criteria for climate assessment, the project will be evaluated using the recommended ISEP significance determination approach. This evaluation will account for any embedded or planned mitigation measures included in the project design (ISEP, 2020).

According to LA 114, professional judgment is essential when contextualizing and assessing the significance of a project's GHG impact. In alignment with ISEP Guidance, LA 114 emphasises that the core of assessing significance is not just whether a project emits GHGs or the magnitude of these emissions alone, but rather whether the project helps reduce GHG emissions compared to a baseline that aligns with a net zero trajectory by 2050 (UK Highways Agency, 2019) .

Significance determination for emissions generated by the Proposed Development in this assessment is based on the criteria presented in Table 9-3 as guided by ISEP in addition to the following two factors:

- The extent to which the trajectory of GHG emissions from the Proposed Development aligns with Ireland's GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

Table 9-3 Definition of Climate Significance

Magnitude of Impact	Description
Major or Moderate Adverse (i.e. significant)	A project that follows a 'business-as-usual' or 'do minimum' approach and is not compatible with the net zero trajectory by 2050 or sectoral based transition to next zero targets, results in a significant adverse effect. It is down to the consultant completing the assessment to differentiate between the 'level' of significant adverse effects, e.g. 'moderate' or 'major' adverse effects. A project's impact can shift from significant adverse to non-significant effects by incorporating mitigation measures that substantially improve on business-as-usual and meet or exceed the science-based emissions trajectory of ongoing but declining emissions towards net zero. Meeting the minimum standards set through existing policy or regulation cannot necessarily be taken as evidence of avoiding a significant adverse effect. This is particularly true where policy lags behind the necessary levels of GHG emission reductions for a science based 1.5°C compatible trajectory towards net zero.
Minor Adverse (i.e. not significant)	A project that is compatible with the budgeted, science based 1.5°C trajectory (in terms of rate of emissions reduction) and which complies with up-to-date policy and 'good practice' reduction measures to achieve an impact that has a minor adverse effect but is not significant. The project may have residual impacts but is doing enough to align with, and contribute to, the relevant transition scenario. A 'minor adverse' or 'negligible' non-significant effect conclusion does not necessarily refer to the magnitude of GHG emissions being carbon neutral (i.e. zero on balance) but refers to the likelihood of avoiding severe climate change and achieving net zero by 2050. A 'minor adverse' effect or better is a high bar and indicates exemplary performance where a project meets or exceeds measures to achieve net zero earlier than 2050.
Negligible	A project that achieves emissions mitigation that goes substantially beyond the reduction trajectory, or substantially beyond existing and emerging policy compatible with that trajectory, and has minimal residual emissions, is assessed as having a negligible effect that is not significant.
Beneficial	A project that achieves emissions mitigation that goes substantially beyond the reduction trajectory, or substantially beyond existing and emerging policy compatible with that trajectory, and has minimal residual emissions, is assessed as having a negligible effect that is not significant.

Ireland's carbon budgets provide a framework for understanding the significance of GHG emissions from the Proposed Development. This involves comparing the anticipated net GHG

emissions of the development with the established carbon budgets. With the introduction of the Climate Action Act in 2021 and the Climate Action Plan 2025, sector-specific carbon budgets have been outlined for comparison with the development's net GHG emissions over its lifecycle. For the Transport sector, which emitted approximately 12 MtCO₂e in 2018, the budget has a 2030 cap of 6 MtCO₂e, reflecting a 50% reduction. Similarly, the Industry sector, with 2018 emissions of about 7 MtCO₂e, has a 2030 ceiling of 4 MtCO₂e, indicating a 35% reduction (see Table 9-4).

9.6.4.5 Climate Change Risk Assessment-Criteria for Climate Vulnerability

Climate change risk assessment is a risk assessment-based methodology for identifying potential climate impacts and assessing their severity. Carrying out a climate change risk assessment, at the simplest level, can be summarised into the following steps:

- identifying potential climate change risks to a scheme or project.
- assessing these risks (potentially prioritising to identify the most severe); and
- formulating mitigation actions to reduce the impact of the identified risks.

Any assessment of risk includes assessing the likelihood (or probability) and magnitude (or severity) of the impacts identified. This method is widespread within the climate change resilience assessments carried out by projects and cities to date.

The risk assessment assesses the likelihood and consequence of the impact occurring to each receptor, leading to the evaluation of the significance of the impact and the vulnerability of the Proposed Development to various climate hazards. The vulnerability is determined by combining the sensitivity and the exposure of the Proposed Development to various climate hazards.

To evaluate the likelihood of climate risk, we have utilised the baseline environmental information provided in Section 9.2, future climate change models, and insights from other experts involved in the Proposed Development (e.g., hydrologists and traffic consultants).

Initially, a preliminary screening/vulnerability assessment Climate Change Risk Assessment (CCRA) focusing on the operational phase is performed, following the TII guidance PE-ENV-01104 (2022). This involves assessing the sensitivity of the development assets (i.e., receptors) and their exposure to climate change hazards. Each asset category within the Proposed Development must be assigned a level of sensitivity to climate hazards. PE-ENV-01104 outlines the asset categories and climate hazards that should be considered.

The specific asset categories will differ depending on the type of development and need to be determined on a case-by-case basis.

- **Asset Categories** Pavements; drainage; structures; utilities; landscaping; signs, light posts, buildings, and fences.
- **Climate Hazards** Flooding (coastal, pluvial, fluvial); extreme heat; extreme cold; wildfire; drought; extreme wind; lightning and hail; landslides; fog.

The sensitivity is based on a High, Medium or Low rating with a score of 1 to 3 assigned as per the criteria below.

- **High Sensitivity** The climate hazard will or is likely to have a major impact on the asset category. This is a sensitivity score of 3.

- **Medium Sensitivity** It is possible or likely the climate hazard will have a moderate impact on the asset category. This is a sensitivity score of 2.
- **Low Sensitivity** It is possible the climate hazard will have a low or negligible impact on the asset category. This is a sensitivity score of 1.

Once the sensitivities have been identified the exposure analysis can be completed. The exposure analysis involves determining the level of exposure of each climate hazard at the project location irrespective of the project type for example: flooding could be a risk if the project location is next to a river in a floodplain. Exposure is assigned a level of High, Medium or Low as per the below criteria.

- **High Exposure** It is almost certain or likely this climate hazard will occur at the project location i.e. might arise once to several times per year. This is an exposure score of 3.
- **Medium Exposure** It is possible this climate hazard will occur at the project location i.e. might arise a number of times in a decade. This is an exposure score of 2.
- **Low Exposure** It is unlikely or rare this climate hazard will occur at the project location i.e. might arise a number of times in a generation or in a lifetime. This is an exposure score of 1.

Once the sensitivity and exposure are categorised, a vulnerability analysis is conducted by multiplying the sensitivity and exposure to calculate the vulnerability i.e. climate screening.

$$\text{Vulnerability} = \text{Sensitivity} \times \text{Exposure}$$

The vulnerability assessment takes any proposed mitigation into account. Table 9-4 details the vulnerability matrix; vulnerabilities are scored on a high, medium and low scale. Where residual medium or high vulnerabilities exist, the assessment may need to be progressed to a detailed climate change risk assessment and further mitigation implemented to reduce risks.

According to TII guidance and EU technical guidance, if all identified vulnerabilities are reasonably ranked as low, a detailed climate risk assessment may not be necessary i.e. it is screened out. In such cases, the impact of climate change on the development would be deemed insignificant.

However, if there are residual medium or high vulnerabilities, a more detailed climate change risk assessment may be required, along with the implementation of additional mitigation measures to address the risks. The TII guidance specifies that a construction phase Climate Change Risk Assessment (CCRA) is only required if a detailed CCRA is deemed necessary.

Table 9-4 Vulnerability Matrix

	Exposure			
Sensitivity		High (3)	Medium (2)	Low (1)
	High (3)	9- High	6- High	3- Medium
	Medium (2)	6- High	4- Medium	2- Low
	Low (1)	3- Medium	2- Low	1- Low

The vulnerability conclusions for each impact are based on, and incorporate, confirmed design and mitigation measures. Where the assessment concludes that the impact remains high, the project team may need to identify additional adaptation/EIA mitigation measures.

The screening CCRA (vulnerability assessment), detailed in Section 9.9.3.2, did not identify any residual medium or high risks to the Proposed Development as a result of climate change. Therefore, a detailed CCRA for the construction and operational phase were scoped out.

While a CCRA for the construction phase was not required, best practice mitigation against climate hazards is still recommended in Section 9.11

9.6.5 Difficulties Encountered / Limitations

Difficulties were encountered during the quantification of materials at the design stage in order to assess the embodied construction and operational carbon. The exact volumes of materials, location of waste disposal sites, sourcing of products and technical specification for materials are finalised during the detailed design phase and by the appointed contractor. Throughout the assessment, efforts have been made to provide the most likely scenario of the embodied carbon assessment. Where it is required to make assumptions as the basis of the assessment presented here, these assumptions are based on advice from competent project designers and are clearly outlined within the chapter.

9.7 The Existing and Receiving Environment (Baseline Situation)

Climate refers to the average weather conditions over a period of time, typically 30 years, while climate change denotes a substantial alteration in these average conditions. Although climate change can occur naturally, human activities in recent years have accelerated its pace through the emission of GHG (GHGs), as noted by the IPCC in 2015. These anthropogenic GHGs are changing the composition of the Earth's atmosphere, leading to an enhanced 'Greenhouse Effect.' This effect increases the atmosphere's capacity to trap heat, resulting in a rise in average global temperatures over the past four decades. The burning of fossil fuels, which releases significant amounts of carbon dioxide (CO₂), has been and remains a major contributor to this enhanced greenhouse effect. The most critical GHGs include carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O).

Global climate change refers to the long-term shift in temperature and weather patterns on Earth, primarily driven by human activities such as burning fossil fuels, deforestation, and industrial processes. These activities increase the concentration of greenhouse gases in the atmosphere, enhancing the greenhouse effect and leading to a rise in average global temperatures. This warming impacts natural systems, causing more frequent and severe weather events, melting polar ice, rising sea levels, and disruptions to ecosystems and biodiversity. The effects of climate change are profound, affecting agriculture, water resources, health, and the economy, necessitating urgent and sustained efforts to mitigate and adapt to these changes.

Ireland is also experiencing the impacts of a changing climate with the rise in the annual surface air temperature by 0.8% since 1900. In addition to temperature, we are seeing increased rainfall and sea-level rise and observing changes in the frequency of extreme weather like storms, flooding, and drought (EPA, 2023). Examples of extreme weather would be Storm Ophelia in 2017 and the Beast from the East in 2018 to name two of the most impactful.

9.7.1 Current Baseline

9.7.1.1 Existing GHG Emissions Baseline

Ireland's latest publicly available greenhouse gas (GHG) emissions from 1990-2024 are based on SEAI's provisional energy balance released in June 2025 (EPA, 2025). In 2024, total national GHG emissions (excluding LULUCF) are estimated at 53.75 Mt CO₂eq, which is 2.0% lower (1.09 Mt CO₂eq) than in 2023 (54.85 Mt CO₂eq), following a 6.8% decrease in emissions reported for 2023. Emissions in 2024 are 3.6% lower than the 1990 baseline—the first such drop in 33 years. National total emissions including Land Use Land Use Change and Forestry (LULUCF) decreased by 1.9% to 57.65 Mt CO₂eq. ETS4 and ESR emissions fell by 7.4% and 0.5% respectively (EPA, 2025).

Climate impacts are evaluated at a national level, considering national targets and sectoral emission ceilings. The study area for climate assessments is the Republic of Ireland, with the baseline established in the context of this geographic focus.

In 2023 emissions in the stationary ETS1 emissions decreased (17%) and emissions under the ESR (Effort Sharing Regulation) decreased (3.4%). When LULUCF is included, total national emissions decreased by 3.8% (EPA, 2025).

Decreased emissions in 2023 compared to 2022 were observed in the largest sectors except for transport which showed an increase of 0.3% shown highlighted red in the "Emissions change 2022-2023" table 9.5 below (EPA, 2025). Climate impacts are evaluated at a national level, considering national targets and sectoral emission ceilings. The study area for climate assessments is the Republic of Ireland, with the baseline established in the context of this geographic focus. The table shows that Waste accounted for 0.844% of emissions in 2023.

Table 9-5 Emissions change 2022-2023 Ireland.

Mt CO ₂ eq	2022	2023	% Change
Agriculture	21.782	20.717	-4.9%
Transport	11.759	11.798	0.3%
Energy Industries	10.003	7.860	-21.4%
Residential	5.753	5.347	-7.1%
Manufacturing Combustion	4.356	4.152	-4.7%
Industrial Processes	2.294	2.155	-6.1%
F-Gases	0.719	0.675	-6.0%
Commercial Services	0.734	0.715	-2.6%
Public Services	0.690	0.671	-2.7%
Waste	0.870	0.844	-3.0%
LULUCF	3.655	3.895	6.5%
Total excluding LULUCF	58.960	54.934	-6.8%
Total including LULUCF	62.616	58.829	-6.0%

Emissions per capita decreased from 11.31 tonnes CO₂eq/person in 2022 to 10.34 tonnes CO₂eq/person in 2023. Ireland's average tonnes of GHG/capita over the last ten years were

12.08 tonnes. With CSO 2022 census data showing a population of 5.28 million people and with population projected to increase to 5.67 million in 2030, 6.05 million in 2040 and 6.33 million by 2050, per capita emissions need to reduce significantly. At current per capita emission levels, each addition 500,000 people would contribute an additional 5 million tonnes of CO₂eq annually.

The EPA also publishes GHG emission projections to 2055. Table 9-6 shows that in the WAM scenario the percentage reduction is not achieved for electricity, transport, industry, agriculture and other (comprises of waste, fluorinated-gases and petroleum refining). Looking at the overall percentage emissions reduction target of -51% by 2030 compared to 2018, the projections are indicating a significant shortfall with only a -29% reduction achieved thus predicting that Ireland will not achieve its legally binding climate target (EPA, 2024).

Table 9-6 Assessment of Achievement of Sectoral Percentage Targets under the With Additional Measures scenario (EPA)

Sector	Emissions 2018 (Mt CO ₂ eq)	Projected Emissions 2030 (Mt CO ₂ eq)	Percentage Change 2030 vs 2018	Target Reduction 2030 vs 2018	Percentage Change (Reported in 2024) 2030 v 2018
Electricity	10.2	3.1	-0.7	-75%	-0.66
Transport	12.3	9.7	-0.21	-50%	-0.29
Buildings (Residential)	7	5.4	-0.22	-40%	-0.4
Buildings (Commercial & Public)	1.5	1	-0.36	-45%	-0.6
Industry	7	6.1	-0.12	-35%	-0.24
Agriculture	21.4	18	-0.16	-25%	-0.18
Other	2.1	1.6	-0.25	-50%	-0.25
LULUCF* (no ceiling currently)	4	5.5	0.39	N/A	0.17
Total with LULUCF	65.6	50.6	-0.23	-51%	-0.29

*A direct comparison of emissions in the Agriculture sector against its Sectoral Emission Ceilings is no longer viable.

** Waste, F-gases and Petroleum Refining

***National objective includes LULUCF

9.7.2 Future GHG Baseline

In line with TII and ISEP Guidance the future baseline is a trajectory towards net zero by 2050, “whether it [the project] contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050” (ISEP, 2022). Formerly known

as the Institute of Environmental Management and Assessment (ISEP), now rebranded as the Institute of Sustainability and Environmental Professionals (ISEP).

The future baseline for GHG emissions assessment will be considered in relation to the future Irish climate targets which the assessment results will be compared against.

The future baseline will be based on Ireland achieving the targets outlined in the Climate Action Plan 2025 (CAP25) and subsequent Climate Action Plans, as well as meeting binding EU targets for 2030. In order to meet the commitments under the Paris Agreement, the European Union (EU) enacted '*Regulation (EU) 2018/842 on binding annual GHG emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013*' (hereafter referred to as the Regulation). The Regulation aims to deliver, collectively by the EU in the most cost-effective manner possible, reductions in GHG emissions from the Emission Trading Scheme (ETS) and non-ETS sectors amounting to 43% and 30%, respectively, by 2030 compared to 2005. The Regulation was amended in April 2023 and Ireland must now limit its GHG emissions by at least 42% by 2030. The ETS is an EU-wide scheme which regulates the GHG emissions of larger industrial emitters including electricity generation, cement manufacturing and heavy industry. The non-ETS sector includes all domestic GHG emitters which do not fall under the ETS scheme and thus includes GHG emissions from transport, residential and commercial buildings and agriculture.

9.7.3 Current CCRA Baseline

Impacts to the Proposed Development as a result of climate change involve increases in temperatures and increases in the number of rainfall days per year. Ireland has observed increases in the annual rainfall in the north and west of the country, with small increases or decreases in the south and east including in the region where the Proposed Development will be located. The EPA (2021) has compiled a list of potential adverse impacts as a result of climate change including the following which may be of relevance to the Proposed Development:

- Increase of 1 to 4 degrees Celsius in average temperature;
- More intense storms and rainfall events;
- Increased likelihood and magnitude of river and coastal flooding;
- Water shortages in summer in the east;
- Adverse impacts on water quality; and
- Changes in distribution of plant and animal species

The Proposed Development area experiences a temperate, maritime climate, resulting in mild winters and cool summers. The Met Éireann weather station at Casement, Co. Dublin is the nearest weather and climate monitoring station to the Proposed Development that has meteorological data recorded for the 30-year period from 1991 to 2020 (Met Éireann, 2023). The monitoring station is located approximately 30km north of the Proposed Development at its nearest point. Meteorological data recorded at Casement over the 30-year period from 1991 to 2020 indicates that the wettest months were October and November, and the driest month on average was March. July was the warmest month with a mean temperature of 19.8°C.

Met Éireann recent weather patterns were analysed, they highlight a marked rise in both the frequency and intensity of storms. Notable examples include Storm Darwin in February 2014, Storm Emma in March 2018, Storm Ophelia in October 2018, Storm Éowyn in January 2025

and Storm Chanra in 2026. During Storm Ophelia, Casement Airport recorded its highest wind gust, reaching 117 km/h, with a sustained 10-minute wind speed of 85 km/h.

Annual rainfall from 1989 to 2018 was 6% higher compared to the 30-year period from 1961 to 1990. On 24 October 2011, Casement Airport recorded 76.5 mm of rainfall over a 9-hour span, an event with an annual probability of once in 60 years. As rainfall has increased in Ireland, recent years have seen more intense historical precipitation events, such as the heavy rainfall and flooding in the summer of 2008, severe flooding in November 2009, and the heavy rainfall in the Greater Dublin Area on 24 October 2011. The latest data from Met Éireann's 'The Status of Irish Climate 2020 Report' highlights that the 10-year period from 2006-2015 was the wettest recorded decade (Met Éireann, 2021).

Met Éireann's 2024 Climate Statement states 2024's average shaded air temperature in Ireland is provisionally 10.72 °C, which is 1.17°C above the 1961-1990 long-term average. This makes 2024 the fourth warmest year on record, 0.49 °C cooler than 2023, the warmest year on record. The five warmest years on record are 2023, 2022, 2007, 2024 and 1945. Seven of the top ten warmest years have occurred since 2005. (Met Éireann, 2024).

In 2024, Ireland experienced below-average rainfall, including the warmest May on record. Since April 2023, record-high sea surface temperatures (SST) were observed, with a severe marine heatwave affecting the western coast of Ireland in June 2023. This marine heatwave contributed to the unprecedented rainfall in July 2023 (Met Éireann, 2024).

Recent weather patterns and extreme weather records from Met Éireann have been examined. Given the exceptional data from 2023 and 2024, Met Éireann notes that current Irish climate projections predict continued warming, including milder winters. The record temperatures increase the likelihood of extreme weather events, leading to longer dry periods and heavier rainfall. Additionally, sea level rise is expected to cause more storm surges and coastal flooding, with an increase in compound events where coastal surges and extreme rainfall occur simultaneously. While Met Éireann is confident that maximum rainfall rates will rise, there is less certainty about how the frequency or intensity of storms will change with climate change.

Surface air temperature plays a crucial role in climate analysis, influencing ecosystems, livelihoods, and human activities. Changes in temperature affect various sectors, including health, agriculture, and energy demand. In Ireland, over a century of consistent temperature measurements is available. Globally, the average surface air temperature has increased by 0.85°C over the past 100 years, with the rate of warming nearly doubling since 1975, reaching an equivalent of a 1.65°C rise per century. The five warmest years on record globally are now 2020 through 2024, with 2024 confirmed as the warmest year ever recorded since temperature monitoring began in the late 1800s. This marks a dramatic continuation of the warming trend observed over the past decade, with all ten of the warmest years occurring since 2015 (Met Éireann 2025).

9.7.4 Future CCRA Baseline

The EPA-funded research project 'Ensemble of Regional Climate Model Projections for Ireland Report No. 159' (EPA 2015) forecasts significant reductions in mean annual, spring, and summer precipitation, with longer dry spells expected. By 2050, the most pronounced decreases are projected for summer, with reductions ranging from 0% to 13% under medium-to-low emission scenarios and 3% to 20% under high emission scenarios. In contrast, heavy

precipitation during winter and autumn is expected to increase by up to 20%. Additionally, the number of extended dry periods during autumn and summer is anticipated to rise considerably by mid-century.

The report suggests that the total number of North Atlantic cyclones is expected to decrease by 10%, along with a reduction in average mean sea-level pressure of 1.5 hectopascals (hPa) across all seasons by mid-century. Wind energy is anticipated to decline in spring, summer, and autumn, with an increase expected in winter. Additionally, the predicted rise in extreme storm activity could negatively impact future wind energy supply.

The EPA's State of the Irish Environment Report (Chapter 4: Climate Change) further highlights that projections indicate that the comprehensive implementation of additional policies and measures from the 2019 Climate Action Plan could reduce Ireland's total GHG emissions by up to 25 percent by 2030 compared to 2020 levels. Climate change is already a current issue in Ireland, with a temperature increase of approximately 0.8°C since 1900. The report further highlights the importance of strong public sector climate leadership and the rapid acceleration of decarbonisation efforts if we are to halt the climate crisis (EPA, 2024).

Accurate climate projections are a key scientific input for national policymakers when planning for, and adapting to, the challenges posed by climate change. Climate projections are produced using climate models, which have been developed by scientists over recent decades and are capable of simulating Earth's past, present, and future climate. Global Climate Models (GCMs) are used to model the global impacts on Earth's climate of increasing GHG concentrations in the atmosphere at a resolution of ~50km or coarser. Regional Climate Models (RCMs) are used to capture key small-scale atmospheric features on the scale of 1-10km, such as local convection and wind gusts. Multi-model ensembles are often used in climate prediction studies to quantify associated model uncertainty.

RCMs utilise the output of GCMs and model regional climates at higher spatial resolutions; this process is known as dynamic downscaling. This approach allows key climate variables to be modelled more precisely, including precipitation; near-surface temperature; and the number and intensity of low-pressure systems. Low pressure systems are the primary driver of precipitation and wind affecting the country; therefore, the added value of RCMs in the modelling of low-pressure systems is of particular importance for Ireland.

Concentration trajectories known as Representative Concentration Pathways (RCPs) were utilised in EPA Research Report No.339 High resolution Climate Projections for Ireland – A Multi-model Ensemble Approach (EPA 2020). For the EPA study, two RCPs were chosen, RCP4.5 and RCP8.5. RCP4.5 is considered an intermediate scenario, while RCP8.5 is considered to be representative of a potential worst-case scenario. This is the only available climate projection data for Ireland which has been developed for policy makers, and is steered by DECC, the EPA, Met Eireann, and the LA CAROs.

The future climate was modelled using both the Representative Concentration Pathway 4.5 (RCP4.5) (medium-low) and RCP8.5 (high) scenarios. The study suggests that by mid-century (2041–2060), average annual temperatures are projected to rise by 1–1.2°C under RCP4.5 and 1.3–1.6°C under RCP8.5, with the most significant increases in the east. Temperature extremes are expected to become more pronounced, with summer daytime and winter night-time temperatures increasing by 1–2.4°C. The number of frost and ice days is projected to decrease by approximately 50%. Summer heatwaves are likely to become more frequent,

especially in the south. Additionally, precipitation is expected to become more variable, with a significant increase in both dry periods and heavy rainfall events.

Established in June 2022, the National Framework for Climate Services (NFCS) aims to streamline the provision of climate services in Ireland and will be led by Met Éireann. The NFCS is designed to facilitate the co-production, delivery, and utilization of precise, actionable, and accessible climate information and tools to enhance climate resilience planning and decision-making. In parallel with the NFCS, ongoing research is being conducted through the TRANSLATE project. This initiative, led by climate researchers from the University of Galway's Irish Centre for High End Computing (ICHEC) and University College Cork's SFI Research Centre for Energy, Climate, and Marine (MaREI), with support from Met Éireann climatologists, is focused on advancing climate science. TRANSLATE generates outputs using internationally reviewed models from CORDEX and CMIP5, with Representative Concentration Pathways (RCPs) offering a range of possible futures based on different human activity scenarios.

TRANSLATE offers the first standardised and bias-corrected national climate projections for Ireland, designed to support climate risk decision-making across various sectors, such as transport, energy, and water. The bias correction means that users can use the data directly (which is not always possible).

It provides insights into potential changes in Ireland's climate under global temperature increases of 1.5°C, 2°C, 2.5°C, 3°C, or 4°Cs. These projections generally align with previous forecasts for Ireland. The country's climate is heavily influenced by the Atlantic Meridional Overturning Circulation (AMOC), a major system of ocean currents, including the Gulf Stream, which features a northward flow of warm water and a southward flow of cold water. This system prevents Ireland from experiencing the extreme temperatures seen in other countries at similar latitudes. Recent studies suggest that the AMOC may weaken by 30–40% by 2100, leading to cooler North Atlantic Sea Surface Temperatures (SSTs). Despite this, Ireland is expected to continue warming, though the cooling effect of the AMOC might moderate the warming relative to continental Europe. Additionally, a weakened AMOC is anticipated to contribute to further sea level rise around Ireland. Climate change will cause significant shifts in temperature and rainfall patterns: average summer temperatures could rise by more than 2°C, summer rainfall could decrease by 9%, and winter rainfall could increase by 24%. Future projections also include a tenfold rise in the frequency of summer nights with temperatures exceeding 15°C by the end of the century, a decrease in the frequency of cold winter nights, and an increase in heatwaves. In Ireland, a heatwave is defined as a period of five consecutive days with daily maximum temperatures above 25°C.

9.7.5 Evolution of the environment in the absence of the Proposed Development

Annex IV of the EIA Directive sets out the information required to be included in an EIAR. This includes:

“a description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the Proposed Project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge”.

In the event that the Proposed Development does not proceed, an assessment of the future baseline conditions has been carried out and is described within this section. In the “do-nothing” scenario the intake of soil for reuse/recycling would not occur.

There is potential for indirect positive impact to climate from the Proposed Development. In the absence of the Proposed Development, surplus excavated soil from local construction sites would require disposal at more distant locations, increasing transportation distances and associated greenhouse gas (GHG) emissions, as well as the continued need for extraction of natural resources. The predicted GHG emissions associated with the Proposed Development will not occur, but any potential GHG reductions from reduced transportation and resource extraction, as well as increased local benefits—such as improved land suitability for future agricultural, forestry, or amenity uses—would also not occur.

9.8 Climatics Multi-Climate Hazard Analysis for Kyletalesha at Coordinates (53.073856, -7.319916)

Under each scenario, nine categories of climate risk indices (20+ hazards) were assessed. The findings and recommendations are summarised in the following table. For the key indices, both the chronic risk (average trend) and acute risk (extremes) are provided. For example, the change in mean temperature and fire weather days are introduced in the temperature-related indices, as temperature is considered as the most relevant impact factor for climate change on asset resilience.

Table 9-7 Assessment of climate risk indices

Category	Hazard	Summary	Exposure Level
Cloud Related	Cloud Cover	Historic average cloud cover in the area was 78.98%. This is projected to decrease to 78.43% (-0.55%) under SSP1-2.6 and 77.35% (-1.62%) under SSP5-8.5 for 2050..	4
Drought And Floods	Flood Events	The historic inundation of 100-yr flood event is 0.00 m. This is projected to 0.00 m (0%) under SSP1-2.6 and 0.00 m (0%) under SSP5-8.5 for 2050.	1
	Water Stress	The water stress index ranges from 1 to 5, with 1 indicating low stress and 5 indicating high stress. The historic water stress is rated as 1.00. And this is projected to 1.00 under SSP1-2.6 and 1.00 under SSP5-8.5 for 2050.	1
Hailstorm	Hailstorm Frequency	Historical hailstorms in this location were 0.12 events/year.	n/a
Heat Stress	Heat Stress Index	The historic heat stress index in the area is 12.66. And this is projected to increase to 13.92 under SSP1-2.6 and 14.49 under SSP5-8.5 scenarios for 2050.	3
Irradiance At Surface	Surface Reaching Solar Radiation	The surface reaching solar radiation in the area was historically 119.99 W/m ² and this is projected to increase to 126.01 W/m ² under SSP1-2.6 and 124.45 W/m ² under SSP5-8.5 for 2050.	2
Lightning	Lightning Density	The historic lightning density in the area was 0.03 event/1000km ² /year.	n/a

Rainfall Related	Annual Max. 1-Day Precipitation	Historic annual maximum 1-day precipitation in the area was 34.13 mm. This is projected to increase to 38.75 mm under SSP1-2.6 and 37.03 mm under SSP5-8.5 for 2050.	4
	Annual Max. 5-Day Precipitation	Historic annual maximum 5-day precipitation in the area was 64.80 mm. This is projected to increase to 72.75 mm under SSP1-2.6 and 69.43 mm under SSP5-8.5 for 2050.	4
	Extreme Precipitation	Precipitation over 99% quantile is defined as extreme precipitation. The historic average extreme precipitation is 64.57 mm for a year and this is projected to increase to 79.84 mm (+23.66%) under SSP1-2.6 and 74.07 mm (+14.72%) under SSP5-8.5 for 2050.	4
	Heavy Precipitation Days	Precipitation over 10mm is defined as heavy precipitation. The historic average heavy precipitation days in the area was 26.79 days in a year. This is projected to increase to 28.15 days under SSP1-2.6 and 28.60 days under SSP5-8.5 for 2050.	5
	Average Annual Precipitation	Historic average precipitation in the area was 1065.70 mm/year. This is projected to decrease to 1062.86 mm/year under SSP1-2.6 and 1052.25 mm/year under SSP5-8.5 for 2050.	5
Subsidence And Landslide	Landslides	The historic landslide in the area is 0.00.	n/a
	Subsidence Susceptibility Index	Subsidence susceptibility index ranges from 1-6, as very low, low, medium low, medium high, high, very high. The historic subsidence susceptibility index in the area is 2.00 and is projected to be 0.00 for 2040.	n/a
Temperature Related	Cold Days	The historic cold days in the area were 8.05% per year. This is predicted to decrease to 3.45% under SSP1-2.6 and 1.89% under SSP5-8.5 for 2050.	3
	Days >35°C	The historic days above 35°C in the area were 0.00 days per year. This is predicted to decrease to 0.00 days under SSP1-2.6 and 0.00 days under SSP5-8.5 for 2050.	1
	Days >40°C	The historic days above 40°C in the area were 0.00 days per year. This is predicted to 0.00 days under SSP1-2.6 and 0.00 days under SSP5-8.5 for 2050.	1
	Fire Weather Days	The historic fire weather days in the area were 21.55 days per year. This is predicted to increase to 30.07 (+39.50%) days under SSP1-2.6 and 36.51 (+69.39%) days under SSP5-8.5 for 2050.	2

	Mean Temperature	The historic mean annual temperature in the area is 9.44°C. This is projected to increase to 10.38°C (+0.94°C) under SSP1-2.6 (optimistic) and 10.92°C (+1.48°C) under SSP5-8.5 (business as usual or pessimistic scenario) for 2050.	3
	Warm Days	Warm day are defined as when the maximum temperature is beyond 90% percentile. The historic warm days in the area are 13.35% per year and this it projected to increase to 26.13% under SSP1-2.6 and 31.01% under SSP5-8.5 scenarios for 2050.	2
Wind Related	Storm Wind Speed	The historic storm wind speed of the area is 16.75 m/s and this is predicted to be decrease to 16.50 m/s (-1.51%) for SSP5-8.5 scenario for 2050.	4
	Wind Speed	Historic average wind speed in the area was 4.65 m/s. This is projected to be 4.38 m/s under SSP1-2.6 and 4.54 m/s under SSP5-8.5 for 2050.	5

9.9 Characteristics of the Proposed Development

In this chapter, the assessment adopts a slightly different approach to that used in the other EIAR chapters. While all chapters identify construction and operational phases, the Climate chapter explicitly incorporates the infilling activities into the construction phase for the purposes of calculating greenhouse gas emissions. The operational phase then refers to the period following completion of infilling, when the lands revert to agricultural use.

This tailored approach allows the Climate assessment to account for emissions associated with both the infilling works and the long-term land use, in line with current climate assessment guidance. For a detailed description of the Proposed Development please refer to Chapter 2 of this EIAR.

9.9.1 Construction Phase

During the construction stage the main source of climate impacts will be as a result of GHG emissions and embodied carbon associated with construction materials and infilling activities. This includes GHG emissions associated with transporting soil from nearby construction sites to the proposed development and vehicle emissions from traffic accessing the site.

9.9.2 Operational Phase

Impacts to climate will occur during the operational phase of the development. For the purposes of this assessment, it has been assumed that the end use of the Proposed Development will be agricultural, as the surrounding area is predominantly utilised for agricultural purposes. However, it should be noted that this is an assumption made specifically for the assessment, and the actual end use may differ in the future. During the operational stage the main source of climate impacts will be assumed to be as a result of GHG emissions and embodied carbon associated with the agricultural use of the lands.

In addition, the vulnerability of the Proposed Development in relation to future climate change must be considered during the operational phase.

9.10 Potential Impact of the Proposed Development

During both the construction and operational phases of the Proposed Development, there is potential for various greenhouse gas emissions to be released into the atmosphere. According to TII guidance, the significance of these GHG emissions on the climate is evaluated based on the total emissions across all stages of the Proposed Development.

9.10.1 Construction Phase GHG Assessment

The TII Carbon toolkit was utilised to quantify the construction phase embedded carbon for the Proposed Development. This toolkit can quantify carbon in infrastructure projects using Ireland-specific emission factors and data. Detailed project information including tonnage of materials was obtained from the Engineering Design Team.

GHG emissions have been quantified at all aspects of the construction phase including the following stages:

- Production stage: Embodied carbon is the carbon contained within a material or product. It is the sum of all carbon emissions that have been generated during the extraction, processing, and manufacturing of a particular product. Mitigation will be required as part of the demolition works to reduce the embodied carbon impact.
- Transportation to site: emissions associated with the carbon miles of the project materials. The impact of transporting materials from factory/source to site to facilitate construction is reported separately. A series of assumptions are made about the variables that impact transport emissions (material density, vehicle type, vehicle capacity and distance travelled) and assuming that the material may be transported from sources locally within 50km, regionally within 100km and nationally within 250km;
- Site Operations/Infilling activities:
 - Site clearance emissions associated with plant and machinery required to clear the site. The carbon tool has a range of assigned land use categories for estimating site clearance. Different land use types have higher or lower carbon intensity for site clearance, which is linked to the energy required to clear the site.
 - Emissions arising from excavation activities based on the energy used in excavation activities. Energy expenditure varies depending on the type of ground to be excavated, e.g., rock excavation is much more energy intensive than topsoil excavation;
 - Infilling activities covers carbon emissions generated during the construction of the Proposed Development based on the scale and duration of the project; and
 - The generation of waste during the construction phase has potential for climate impact and the nature and scale of this impact depends on the type and volume of waste generated coupled with the nature of the waste treatment (reuse, recycling, recovery or disposal).

The results of the assessment of the above stages using the TII Tool are presented in Table 9.8 and Figure 9-5. The results indicate that the total GHG emissions generated as a result of the construction of the Proposed Development 809.1 tonnes CO₂eq.

The carbon assessment has identified hotspots for embodied carbon emissions, particularly those associated with materials. These emissions have been calculated using the average material types from the TII Carbon Tool due to the lack of more specific information.

Material supply and manufacture represent the largest portion of carbon emissions for the Proposed Development, constituting about 65% of the total embodied carbon emissions during the construction phase of the project. The rest of the construction phase's embodied carbon emissions come from construction fuel use and land use change.

The total embodied carbon for the construction phase, throughout the development's five-year lifetime, has been calculated at 809.1 tonnes CO₂e (see Table 9.8). Since the overall GHG emissions from the Proposed Development cannot be directly compared to a single sector's 2030 carbon budget, the emissions are categorised into different assessment areas. These categories must be individually compared to the relevant sectoral emissions budgets, as outlined in Table 9.6. For the Proposed Development, the applicable sectoral emissions budgets include those for Industry, Transport, Agriculture and Waste. The projected emissions for the development are annualised over an assumed 50-year lifespan and then compared to the relevant sector's 2030 carbon budgets. This annualization process facilitates a proper comparison with annual GHG targets.

Table 9-8 Construction Phase Greenhouse Gas Emissions

Stage	GHG Assessment Category	Predicted GHG Emissions (tCO ₂ e)	Relevant Sector for Carbon Budget Comparison	Annualised GHG Emissions as % of Relevant Carbon Budget
Production Stage	Materials & Transportation	523.25	Industry	0.0002%
Site Construction activities	Clearance and demolition	1.28	Industry	0.000001%
Site Construction activities	Excavation	2.30	Industry	0.000001%
Site Construction activities	Construction Worker Travel to Site	0.002	Transport	0.00000004%
Site Construction activities	Construction Fuel Use	199.56	Industry	0.000067%

Site Construction activities	Construction Waste Disposal & Transportation	3.66	Waste	0.000001%
Site Construction activities	Water Use	0.0001	Industry	0.00000000003%
Site Construction activities	Land Use Change	79.23	Agriculture	0.0000009%
Total	809.1 tCO ₂ e			

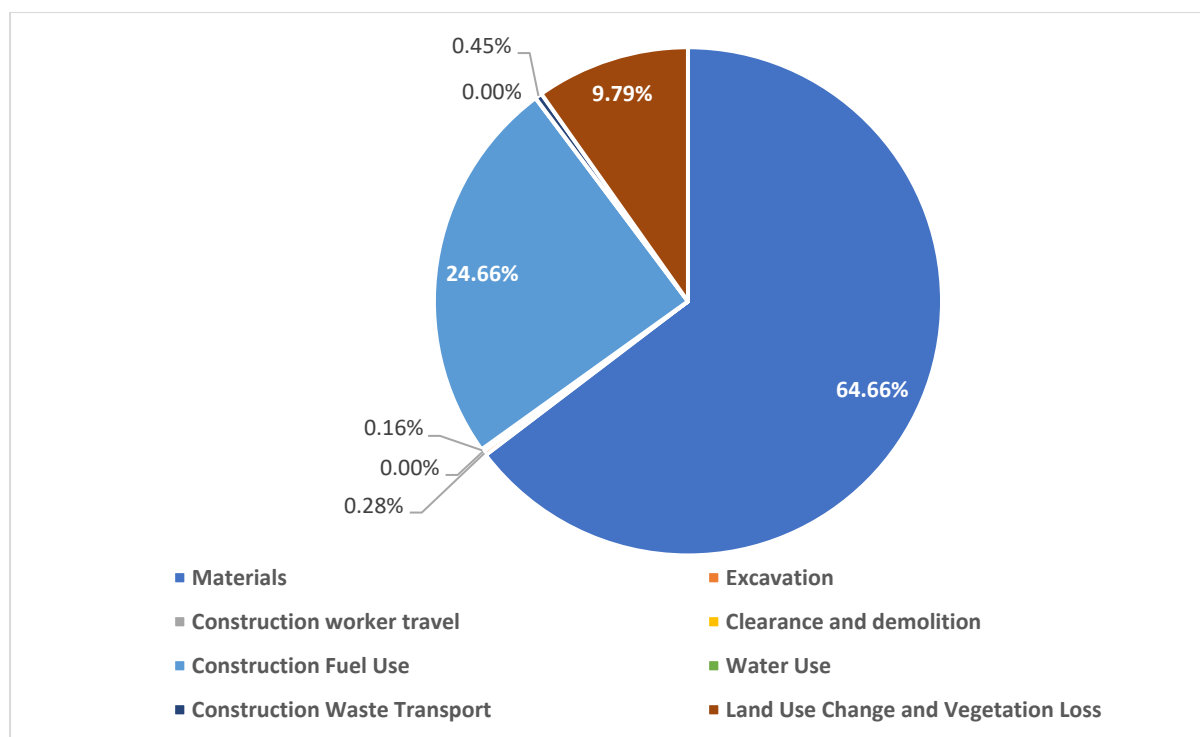


Figure 9-5 Predicted Construction Phase GHG Emissions (tCO₂e)

The projected GHG emissions (outlined in Table 9.8) can be averaged across the entire lifespan of the Proposed Development to provide annual emissions estimates, facilitating direct comparison with national annual emissions and targets.

Table 9.9 compares these GHG emissions with the 2030 carbon budgets for the transport, industry, agriculture and waste sectors, Ireland's total GHG emissions for 2022, and Ireland's EU 2030 target of a 30% reduction in non-ETS sector emissions from 2005 levels (33 Mt CO₂e) as specified in Regulation EU 2018/842.

When annualised over the Proposed Development's 50-year lifespan, the estimated total construction GHG emissions amount to 0.00002751% of Ireland's total GHG emissions in 2022 and 0.00004849% of Ireland's non-ETS 2030 emissions target. Specifically, emissions from transport-related activities account for 0.00026976% of the 2030 Transport budget, construction waste emissions represent 0.00161856% of the Waste budget, industry-related emissions comprise 0.00040464% of the 2030 Industry budget and 0.00009249% of the 2030 Agriculture budget.

Table 9-9 Estimated Construction GHG Emissions relative to Sectoral Budgets and GHG Baseline

Target/Sectoral Budget (tCO ₂ e)		Sector Annualised Proposed Development GHG Emissions are Compared	Annualised Proposed Development GHG Emissions as % of Relevant Target/Budget
Ireland's 2023 Total GHG Emissions (existing baseline)	58,829,000	Total GHG Emissions	0.00002751%
Non-ETS 2030 Target	33,381,312	Total GHG Emissions	0.00004849%
(Industry Sector) 2030 Sectoral Budget	4,000,000	Total Industry Emissions	0.00040464%
(Transport Sector) 2030 Sectoral Budget	6,000,000	Total Transport Emissions	0.00026976%
(Waste Sector) 2030 Sectoral Budget	1,000,000	Total Waste Emissions	0.00161856%
(Agriculture Sector) 2030 Sectoral Budget	17,500,000	Total Agricultural Emissions	0.00009249%

The following measures presented in Table 9-10 will be implemented to reduce GHG emissions during the construction stage.

Table 9-10 GHG reduction measures for the Construction Phase

Description	Rationale
Waste will be segregated and retained on origin site for collection and disposal from its point of origin to avoid double handling and increased haulage to a secondary site for onward transfer and risk of contamination	Reduces haulage from source to intermediate site for onward transfer to a licensed facility
Reduced travel distance for employees	Local employees and plant operators assigned to construction works, reside within a 7km area.
Reduced haulage distances for disposal of non-hazardous waste	Over 50% reduction in travel distance from Portlaoise to Kildare (Rathangan licensed facility) with material retained in Portlaoise.

Capping of a former cut-away bog	Capping of the former bog will lead to rehabilitation processes and reduces carbon emissions
Dense tree planting to the buffer strip will offer carbon savings	To screen and replenish the self-seeded vegetation, trees will be planted to the buffer strip will absorb carbon
Avoiding the need for doubling handling and stockpiling of material will offer carbon saving	Material can be transferred when excavated and avoid stockpiling on origin site for future movement at a later date by plant onward to a licensed facility when capacity at same facility becomes available.

9.10.1.1 Impact of Climate Change on the Proposed Construction Phase

According to the 'LA 114 (2019) – Climate' guidance, which has been successfully implemented in the UK and referenced by the EPA here in Ireland, a qualitative assessment of disruption risk should be reported for the construction phase. The guidance suggests that changes to long-term seasonal averages due to climate change are not anticipated to be significant by the construction year, as predictions are typically cantered around mid-century. However, flooding during construction remains a possibility, and the areas at risk of flooding are detailed in Chapter 7 on Water (Including Hydrology & Flood Risk). Flood risk measures and extreme weather considerations have been integrated into the construction planning process.

As indicated in the Planners Report (Application Reference: 23/200), (LCC, 2023), the Proposed Development is outside the confines of the critical Flood Zones A and B as indicated in the Strategic Flood Risk Assessment of the Plan.

An initial review of flood risk information was conducted for the site and Proposed Development based on information available from OPW's floodinfo.ie. This assessment involved a flood risk identification process to determine if there were any potential flooding or surface water management issues that might affect the site or the Proposed Development. The results of the flood risk identification indicated that there is no significant flood risk to the site. Consequently, the Proposed Development is deemed appropriate for the site, which is classified as Flood Zone C, indicating a low probability of flooding. Additionally, it was also determined that there is no past flood events recorded within a 2.5km radius of the site.

Mitigation measures are outlined in Section 7.7.1 of Chapter 7 Hydrology and Hydrogeology (Including Hydrology & Flood Risk) to manage flood risk impacts during the construction stage.

9.10.2 Operational Phase

9.10.2.1 Operational Impacts

Climate change has the potential to alter weather patterns and increase the frequency of rainfall in future years. As a result of this there is the potential for flooding related impacts on site in future years. However, adequate attenuation and drainage have been provided for to account for increased rainfall in future years as part of the design of this development. Therefore, the impact will be long-term, localised, neutral and imperceptible.

During the operational phase of the development, various greenhouse gas (GHG) emissions may be released into the atmosphere from agricultural usage, traffic emissions, water usage,

waste and end of life emissions. The primary source of GHG emissions at this stage is agricultural land use, specifically cattle grazing. According to Teagasc's comprehensive whole-farm and system modelling for grass-based livestock systems, including both dairy and dry stock operations, typical emissions per hectare of grassland range from 6 to 10 t CO₂e per hectare per year (Teagasc, 2024). In Table 9.11, these operational GHG emissions have been compared against the carbon budget for the agriculture sector in 2030, against Ireland's total GHG emissions in 2022 and against Ireland's EU 2030 target of a 30% reduction in non-ETS sector emissions based on 2005 levels (33 Mt CO₂e) (set out in Regulation EU 2018/842 of the European Parliament and of the Council).

The estimated total GHG emissions, when annualised over the 50-year Proposed Development lifespan, are equivalent to 0.00005% of Ireland's total GHG emissions in 2022 and 0.00010% of Ireland's non-ETS 2030 emissions target. The total GHG emissions associated with transport-related activities are 0.0000001% and 0.00018% of the 2030 agriculture budget.

Table 9-11 Estimated Operational GHG Emissions relative to Residential Budget and GHG Baseline

Target/Sectoral Budget (tCO ₂ e)		Sector Annualised Proposed Development Emissions Compared	Annualised Proposed Development GHG Emissions as % of Relevant Target/Budget
Ireland's 2023 Total GHG Emissions (existing baseline)	58,829,000	Total GHG Emissions	0.00005%
Non-ETS 2030 Target	33,000,000	Total GHG Emissions	0.00010%
(Agriculture Sector) 2030 Sectoral Budget	17,500,000	Total Agriculture Emissions	0.00018%
(Transport Sector) 2030 Sectoral Budget	6,000,000	Total Transport Emissions	0.0000001%

9.10.3 GHGA Significance of Effects

The TII guidance (2022) states that the following two factors should be considered when determining significance:

- The extent to which the trajectory of GHG emissions from the Proposed Development aligns with Ireland's GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

The level of mitigation described in Section 9.10 has been taken into account when determining the significance of the Proposed Development's construction and operational GHG emissions. According to the ISEP significance criteria described in Section 9.6.3.4 and Table 9.1, the significance of the GHG emissions during the construction and operational phase is minor adverse.

In accordance with the EPA guidelines (EPA, 2022), the above significance equates to a significance of effect of GHG emissions during the construction and operational phase which is **direct, long-term, negative, and slight, which is overall not significant**.

9.10.4 Climate Change Risk Assessment

9.10.4.1 Construction Phase

A detailed CCRA of the construction phase has been scoped out, as discussed in Section 9.6.4.5, which state that there are no residual medium or high-risk vulnerabilities to climate change hazards and therefore a detailed CCRA is not required. However, consideration has been given to the Proposed Development's vulnerability to the following climate change hazards with best practice mitigation measures proposed in Section 9.11:

- Flood risk due to increased precipitation, and intense periods of rainfall. This includes fluvial and pluvial flooding which could put additional stress on green/blue infrastructure;
- Increased temperatures potentially causing drought/dry spells, dust, wildfires and prolonged periods of hot weather;
- Reduced temperatures resulting in ice or snow;
- Geotechnical impacts; and
- Major Storm Damage – including wind damage.

9.10.4.2 Operational Phase

To assess the vulnerability of the Proposed Development to climate change, it is essential to first evaluate the development's sensitivity and exposure to various climate hazards i.e. climate screening. The following climate hazards have been analysed in relation to the Proposed Development: flooding (coastal, pluvial, and fluvial), extreme heat, extreme cold, wildfire, drought, extreme wind, lightning, hail, landslides, and fog.

The sensitivity of the Proposed Development to these climate hazards is evaluated independently of its location. Table 9.12 provides a sensitivity assessment of the Proposed Development, rated on a scale from high (3) to medium (2) to low (1). After establishing sensitivity, the exposure of the Proposed Development to each climate hazard is determined, reflecting the likelihood of these hazards occurring at the Proposed Development site, also rated on a scale of high (3), medium (2), and low (1). The overall vulnerability of the Proposed Development to each climate hazard is then calculated by multiplying sensitivity and exposure, as outlined in Table 9.9. This is the initial climate change screening prior to more detailed analysis utilising Climatics climate modelling.

Table 9-12 Climate Change Vulnerability Assessment/Screening

Climate Hazard	Sensitivity	Exposure	Vulnerability
Flooding (Coastal, Pluvial, Fluvial)	1 (Low)	2 (Medium)	2 (Low)
Extreme Heat	1 (Low)	2 (Medium)	2 (Low)
Extreme Cold	1 (Low)	2 (Medium)	2 (Low)
Wildfire	1 (Low)	1 (Low)	1 (Low)
Drought	1 (Low)	1 (Low)	1 (Low)
Extreme Wind	1 (Low)	1 (Low)	1 (Low)
Lightning & Hail	1 (Low)	1 (Low)	1 (Low)
Landslides	1 (Low)	1 (Low)	1 (Low)
Fog	1 (Low)	1 (Low)	1 (Low)

The sensitivity and exposure of the area were assessed using various online tools such as Met Éireann's TRANSLATE tools, Climate Ireland – Climate Change Projection Maps, and DNV's Climatics multi-climate hazard analysis tool in addition to the project teams subject matter expertise. The analysis concluded that the Proposed Development has no significant vulnerabilities to the identified climate hazards, as outlined below. All identified vulnerabilities are classified as low. As a result, there are no residual medium or high-risk vulnerabilities related to climate change hazards, making a detailed Climate Change Risk Assessment (CCRA) unnecessary.

As outlined in the Hydrological Risk Assessment prepared by DNV the Proposed Development site is classified as Flood Zone C, indicating a low probability of flooding. The nearest river to the site is the River Triogue. Which is located approximately 500 meters east of the site. The nearest Natura 2000 site is the River Barrow and the River Nore which is located c. 3000 metres north of the site. Coastal flooding occurs when high sea levels or waves cause water to overflow onto land. However, the development is unlikely to be impacted by such flooding, due to its location being far inland. The Catchment Flood Risk Assessment and Management (CFRAM) flood maps for the site do not indicate any risk of fluvial flooding. The Office of Public Works (OPW) Past Flood Events flood maps do not indicate any past surface or ground water flood events at the site.

Due to the predicted increase in the frequency and intensity of extreme rainfall events, it is prudent that site specific drainage and management measures aimed at mitigating the effects of flooding are incorporated into the development design. The Proposed Development includes the construction of a surface water network which consists of Sustainable Urban Drainage Systems (SuDS) measures which will minimise the impact to the receiving environment and manage the any potential flood risk at the site. The proposed surface water network consists of silt collection sumps, a bypass separator, and a network of gullies.

The new surface water drainage collection network will be provided at commencement (i.e., during the construction phase of the Proposed Development) with the installation of the SuDS measures. Any surface water discharge will be via the bypass separator (i.e., catchpit manholes) with an integrated silt collection chamber for disposal to ground onsite via a soakway (i.e., an infiltration trench sized in accordance with BRE Digest 365 Soakaway

Design). In addition, sumps of approximately 600mm depth, within manhole chambers will serve as silt traps to manage siltation with optional use of strainers within the pipe network and manholes during seasonal weather conditions in order to reduce the silting effects of these particles in the network. Runoff from areas of exposed soil will be intercepted by a silt containment barrier installed as good practice in advance of the drainage feature.

Uncontaminated surface runoff from the Temporary Construction Compound (TCC) will be directed to a swale or infiltration area constructed during the construction phase, to prevent discharge to the existing drainage ditch. The swale will be located at the perimeter of the compound area and will be a wet swale, with runoff infiltrating to ground (i.e., to the existing subsoil). All other runoff from the wider site will continue to follow existing natural drainage patterns and newly installed drainage routes as established above. The correct operation and maintenance of the drainage system is necessary to reduce the risk of human or mechanical error causing pluvial flood risk from blockage. The CFRAM mapping available for the site indicates that the pluvial flood risk to the development is low

Groundwater flooding occurs when the water table rises above the land surface, this means the natural underground drainage system is incapable of sufficiently draining itself, resulting in the emergence of groundwater at the surface. It generally requires sustained rainfall over relatively longer duration than other forms of flooding, its location is discontinuous, and they can last for weeks or months. As outlined in the Hydrological Risk Assessment prepared by DNV the Proposed Development site is classified as Flood Zone C, indicating a low probability of flooding. In addition to this there were also no past flood events recorded within a 2.5km radius of the site.

Regarding wildfires, the Think Hazard! tool developed by the Global Facility for Disaster Reduction and Recovery classifies the wildfire hazard in the area as low. This classification suggests there is a 4% to 10% chance of weather conditions that could support a problematic wildfire in the project area, potentially causing disruptions and posing a low but real risk to life and property each year. Although future climate models predict an increase in conditions favourable to wildfires—such as higher temperatures and extended dry periods—the project's suburban location significantly reduces the wildfire risk. Therefore, the Proposed Development is considered to have a low vulnerability to wildfires.

According to the Landslide Susceptibility Map developed by Geological Survey Ireland (GSI), the Proposed Development Site ranges from Low to Moderately Low in terms of landslide susceptibility.

Extreme temperatures, whether extreme heat or cold, have the potential to affect materials and associated infrastructure. During the detailed design stage, high-quality, durable, and resilient materials will be selected to withstand future temperature fluctuations due to climate change. Consequently, the Proposed Development is assessed to have, at most, low vulnerabilities to these climate hazards, and a detailed risk assessment is not necessary.

There is no additional vulnerability with respect to all climate hazards when design mitigation has been put in place in order to alleviate this known vulnerability to future climate change risk.

9.10.4.3 CCRA Significance of Effects

With the implementation of design mitigation measures, the Proposed Development faces no substantial risks from climate change. As outlined in the EPA Guidelines (EPA, 2022), the impacts of climate change on the development are considered **direct, long-term, negative, and imperceptible**, and are therefore **not deemed significant** in terms of Environmental Impact Assessment (EIA).

9.10.5 Potential Cumulative Impacts

Regarding the requirement for a cumulative assessment, TII PE-ENV-01104 (2022) indicates that "since the GHG assessment pertains to global climate and the impacts on the receptor from a project are not geographically constrained, the typical approach for cumulative assessment in EIA is not deemed applicable." However, by evaluating the GHG impact of a project in relation to its alignment with Ireland's trajectory towards net zero and sectoral carbon budgets, this assessment will demonstrate the project's potential influence on Ireland's ability to meet its national carbon reduction targets. Consequently, the assessment approach is inherently cumulative.

In accordance with ISEP guidance, all GHG emissions are considered cumulatively significant as they contribute to global climate change. The assessment therefore quantifies the project's emissions, places them in the context of relevant carbon budgets, and identifies mitigation measures. For climate change risk assessment, the approach differs: it is a risk-based process focused on the project's resilience to future climate conditions rather than additive impacts. Cumulative assessment in the traditional sense is not generally applicable because climate risks are external drivers, not project-generated effects. However, potential cumulative effects related to climate have been considered within this EIA Chapter.

Cumulative impacts result from the combined effects of the Proposed Development alongside other existing or planned developments in the area. These impacts can intensify climate-related risks and environmental pressures, leading to more pronounced and widespread consequences. ISEP emphasises the importance of understanding these interactions to develop effective mitigation and adaptation strategies that align with broader sustainability objectives.

The cumulative assessment presented in this chapter is informed by the list of existing, permitted, and proposed developments outlined in Chapter 2 of this EIAR, which should be referred to for full details.

Greenhouse Gas (GHG) Emissions

As per ISEP's guidance on assessing climate change within EIAs (2022), the cumulative effect of GHG emissions from the Proposed Development, in conjunction with other developments, must be carefully evaluated. The aggregation of emissions across multiple projects can significantly contribute to global climate change, exacerbating the effects of rising temperatures, more frequent extreme weather events, and changes in precipitation patterns. To address this, we have identified robust mitigation measures aimed at reducing the development's carbon footprint and ensuring alignment with regional and national climate targets. The land surrounding the site is primarily used for agricultural activities. However, two

adjacent industrial facilities—a recycling centre and a knackery—are located near the proposed development and may serve as potential sources of emissions.

Water Resources and Flooding

ISEP (2022) stresses the importance of considering cumulative impacts on water resources, particularly with respect to flood risks and water availability. The combined effect of increased rainfall due to climate change and additional impermeable surfaces from multiple developments can overwhelm existing drainage infrastructure, leading to a higher frequency and severity of flooding events. This underscores the need for integrated water management strategies that enhance the resilience of water systems and incorporate climate adaptation measures, such as sustainable urban drainage systems (SUDS).

Biodiversity and Habitat Loss

Cumulative impacts on biodiversity are another significant concern. ISEP guidance (2022) highlights that climate change, coupled with habitat loss from multiple developments, can lead to more severe impacts on ecosystems and species. The fragmentation of habitats and disruption of ecological networks can accelerate species decline and reduce ecosystem resilience. To mitigate these impacts, the EIA should incorporate strategies for habitat conservation, restoration, and connectivity, ensuring that biodiversity is protected and enhanced in the face of cumulative pressures.

Air Quality and Human Health

ISEP also advises considering the cumulative impacts on air quality and human health. Increased emissions from multiple developments can lead to higher concentrations of pollutants, exacerbating climate change-related health risks, such as respiratory conditions and heat-related illnesses. The EIA should ensure that air quality management plans are in place and that mitigation measures are designed to minimise emissions, particularly in urban areas where cumulative impacts are more likely to be significant.

Soil Degradation and Erosion

Cumulative impacts on soil degradation and erosion are another area of concern highlighted by ISEP. The combined effects of climate change-induced extreme weather events and land disturbance from infilling activities can lead to accelerated soil erosion, reduced fertility, and increased sedimentation in water bodies. Sustainable land management and agricultural practices, including erosion control measures and soil conservation techniques, should be integrated into the development to mitigate these cumulative impacts.

Infrastructure and Energy Demand

Finally, ISEP's guidance emphasises the importance of considering the cumulative impacts on infrastructure and energy demand. As multiple developments increase the demand for energy, there is a risk of overloading local grids and increasing reliance on fossil fuels, which could exacerbate GHG emissions and climate change. The Proposed Development short construction stage does promote energy efficiency to ensure that infrastructure can accommodate future energy needs without compromising climate goals.

9.10.6 Mitigation and Monitoring

In accordance with ISEP guidance (2022), addressing cumulative impacts requires a comprehensive approach that includes effective mitigation strategies and ongoing monitoring. These strategies should focus on enhancing energy efficiency, reducing GHG emissions, protecting natural habitats, managing water resources sustainably, and ensuring resilient infrastructure. Continuous monitoring and adaptive management will be essential to identify cumulative impacts early and to adjust mitigation measures as necessary to minimise long-term environmental and climate-related risks.

By considering cumulative impacts within the climate chapter of the EIA, we ensure a thorough and responsible assessment that aligns with ISEP's best practices, contributing to the sustainability and resilience of both the Proposed Development and the broader environment.

9.10.7 "Do Nothing" Impact

Under the Do-Nothing Scenario the proposed development will not proceed and the previously identified impacts of carbon emissions from equipment, machinery and development operation will not occur. Therefore, this scenario can be considered neutral in terms of climate.

9.11 Avoidance, Remedial & Mitigation Measures

9.11.1 Construction Phase

9.11.1.1 Climate Avoidance, Remedial & Mitigation Measures

During the construction stage specific climate resilience measures should focus on ensuring durability, water management, and energy efficiency while mitigating risks associated with extreme weather considering dust, dry spells, shade, cooling, green/blue infrastructure, and the required drainage capacity.

Here are key Avoidance, Remedial & Mitigation Measures:

Foundation & Site Preparation

- Flood Resilient Foundations: Use raised foundations, elevated platforms, or piling where necessary in flood-prone areas.
- Sustainable Drainage Installation: Implement permeable surfaces, drainage channels, green/blue infrastructure and attenuation tanks early in construction.
- Soil Stabilisation: Prevent erosion and dust generation with silt fences, geotextiles, and retaining structures to withstand heavy rainfall.

Structural Reinforcement

- Wind-Resistant Framing: Use reinforced concrete or steel frames with proper anchoring to withstand storms.

Water Management

- **Proper Drainage on Site:** Ensure temporary drainage solutions including the early adoption of green/blue infrastructure (e.g., trenches, sumps) to manage rainwater and fluctuations in drainage capacity throughout the seasons during construction.

Material Selection & Handling

- **Use Climate-Resilient Materials:** Opt for treated timber, marine-grade plywood, concrete with low permeability, and corrosion-resistant steel.
- **Storage & Protection of Materials:** Keep materials covered and off the ground to prevent water damage or degradation.
- **Low-Carbon Concrete & Insulation:** Use alternatives like GGBS (Ground Granulated Blast-furnace Slag) concrete and eco-friendly insulation.

Energy Efficiency & Passive Design Implementation

- **High-Performance Insulation Installation:** Ensure proper fitting to avoid thermal bridging and moisture ingress.

On-Site Climate Adaptation Measures

- **Construction Scheduling Considerations:** Plan for extreme weather events, avoiding major excavation or external works in heavy rain seasons.
- **Cold/Hot Weather Plan:** Strategies such as planned road gritting, measures to prevent increased dust during hot dry spells, thermal protection such as shaded and cooler areas, chemical accelerants, temporary enclosures, and alternative heating/cooling solutions to enable builders to overcome these obstacles and achieve successful project outcomes.
- **Temporary Wind & Rain Barriers:** Use tarpaulins, scaffolding covers, and temporary roofing to protect partially built structures.
- **Emergency Power Supply:** Have generators or battery backups on site to maintain critical construction processes.

Table 9-13 Climate Change Construction Phase Hazard–Mitigation Matrix

Climate Hazard	Potential Construction-Phase Impact	Mitigation Measures (to be included in CEMP)	Trigger / Monitoring Mechanism
Prolonged Dry Spells / Drought	- Dust generation from soil stockpiles and haul routes - Desiccation and instability of exposed soils - Increased wildfire susceptibility - Worker heat stress	- Hydro-mulching or drought-resistant vegetation on stockpiles - Scheduled wetting using harvested / non-potable water - Fire-risk controls (no-spark tools, extinguishers, exclusion zones) - Heat-stress protocol: shaded rest areas, hydration management, work-rotation	- Met Éireann dry-spell alerts - Visual dust inspections (daily) - PM10/PM2.5 spot monitoring if required
Extreme Rainfall / Intense Precipitation	- Runoff causing erosion and sediment pollution - Overloading of temporary drainage - Excavation collapse - Delays to concrete curing	- Oversized temporary SuDS (silt traps, settlement tanks) with climate change freeboard - Sequenced earthworks to limit exposed surface area - Rapid-deployment drainage (cut-off drains, temporary ditches) - Protective coverings for exposed soil - Inspection and reinforcement of excavations	- Met Éireann yellow/orange rainfall warnings - Daily inspection of drainage features and excavations
High Winds / Storm Events	- Destabilisation of cranes and scaffolding - Wind-borne debris - Damage to temporary structures and sheeting	- Wind-trigger shutdown protocols for cranes - Secure all sheeting, signage, and loose materials - Lowering of crane booms during high winds - Storage of light materials in sheltered areas	- Anemometer readings - Manufacturer specific crane wind thresholds
Extreme Heat / High UV	- Worker heat stress - Accelerated degradation of temporary materials - Reduced concrete curing quality	- Mandatory UV-rated PPE - Adjusted work schedules for heat - Insulated curing blankets; moisture-retentive curing methods - Additional shading/temporary shelter	- Daily temperature/UV index - Heat-stress monitoring records
Cold Spells / Freeze–Thaw	- Frozen ground affecting temporary works - Curing delays; compromised concrete integrity	- Thermal blankets and insulated formwork - Cold-weather concreting accelerants - Gritting of access routes - Monitoring ground temperatures before excavation	- Met Éireann cold-weather alerts - Ground temperature probes

	- Slip hazards		
Wildfire (Low Probability but Climate-Increasing)	- Fire risk to vegetated boundaries and stockpiles - Smoke hazard to workers	- Vegetation management buffer zones - Fire-resistant fencing where required - No-spark tools and smoking restrictions - Onsite fire-fighting equipment	- HSA wildfire advisory updates - Site inspections during prolonged heat/drought
Lightning / Thunderstorm Activity	- Electrocution risk during crane/steel erection - Power surge to temporary site electrics	- Lightning-alert stoppage protocol for crane and steel operations - Surge protection on temporary electrical installations - Evacuation of high-risk elevated work areas	- Lightning warning alerts (Met Éireann / Weather Radar)
Ground Instability (shrink-swell / saturation)	- Excavation collapse - Differential movement beneath temporary structures	- Geotechnical inspections after prolonged dryness or heavy rainfall - Adaptive temporary shoring - Staged excavation	- Soil moisture condition checks - Engineer sign-off after major weather events
Fog / Reduced Visibility	- Increased collision risk for plant and vehicles	- Reduced-speed protocols - Enhanced lighting on plant - Temporary traffic marshals in fog conditions	- Visibility thresholds (e.g., <100 m)
Supply Chain Disruption due to Severe Weather	- Programme delays - Increased idling, emissions, non-compliant workarounds	- Flexible delivery scheduling - Critical materials buffer stock - Idling-reduction enforcement	- Weather-based risk assessments in weekly planning
High Wind-Driven Rain	- Water ingress into partially built structures - Damage to moisture-sensitive materials	- Temporary waterproof membranes - Elevated storage off ground - Weatherproofing early in build sequence	- Rainfall + wind combined warnings

9.11.1.2 GHG Resilience Avoidance, Remedial & Mitigation Measures

Embodied carbon of materials and infilling activities is the primary source of climate impacts during the construction phase. Pre-construction carbon Avoidance, Remedial & Mitigation Measures include:

Carbon Literacy

- Develop carbon literacy within design and construction teams by providing training on carbon literacy, ESG reporting, and disclosure.
- Incorporate sustainability and carbon considerations into site team talks, construction targets, and reporting.
- Include training clauses for contractors and sub-contractors to upskill their teams in low-energy construction techniques.

Cement Reduction

- Specify the minimum amount of cement needed in concrete and substitute where feasible to reduce cement usage.

Sustainable Procurement

- Review sustainable procurement and material choices during detailed design to identify and implement lower embodied carbon options.
- Request Environmental Product Declarations (EPDs) and prefer products with EPDs where possible within procurement restrictions.
- Drive demand for EPDs by increasing the percentage of products used in the project with EPDs.

Energy and Carbon Performance Reporting

- Plan to disclose the operational energy and carbon performance of the project in your annual reporting.

Construction Waste Management

- Create construction programme allowing sufficient time to determine reuse and recycling opportunities for demolition waste.

EU Taxonomy Compliance

- Review and ensure compliance with the EU Taxonomy Regulation (EU) 2020/852 regarding circular economy practices for construction waste.

Local Material Sourcing

- Source materials locally where possible to reduce transport-related CO2 emissions.

9.11.2 Operational Phase

A number of measures have been incorporated into the design of the development in order to mitigate against the impacts of future climate change. For example, adequate attenuation and drainage have been incorporated into the design of the development to avoid potential flooding impacts as a result of increased rainfall events in future years. These measures have been considered when assessing the vulnerability of the Proposed Development to climate change (see Section 9.10.4).

Agricultural activities associated with cattle production represent the primary source of climate impacts during the operational phase of the proposed development. Emissions arise principally from livestock management, manure handling, fuel use, and on-site energy consumption. While such emissions are inherent to agricultural operations, the implementation of recognised best-practice measures will ensure that greenhouse gas (GHG) emissions are minimised to the extent practicable and that no significant adverse effects on climate arise.

During the operational phase, the following mitigation and adaptation measures shall be implemented on site:

- **Energy-Efficient Equipment and Infrastructure:** Energy-efficient farm machinery, milking equipment, pumps, lighting, and ancillary infrastructure shall be used where practicable. All equipment shall be regularly maintained and operated efficiently to reduce fuel and electricity consumption.
- **Low-Carbon Vehicles and Fuels:** The operator shall remain engaged with developments in low-carbon fuels and agricultural technologies relevant to cattle farming and transport. Conventional fuels shall be reviewed and, where feasible, replaced with lower-carbon alternatives as they become commercially available.
- **Vehicle Idling Reduction:** Farm vehicles and machinery shall not be left idling when not in active use, including during routine yard and livestock management operations.
- **Sustainable Livestock and Land Management:** Stocking rates, grazing regimes, and husbandry practices shall be managed efficiently to optimise productivity per animal and reduce emissions intensity. Permanent grassland shall be retained where practicable, and soil disturbance (e.g. ploughing or reseeding) shall be minimised to protect soil carbon stocks.
- **Nutrient and Manure Management:** Slurry, manure, and fertiliser application shall be informed by soil testing and nutrient management planning, with appropriate timing and methods used to minimise nitrous oxide emissions and nutrient losses.
- **Landscape and Boundary Features:** Existing hedgerows, trees, and field boundaries shall be retained and managed where practicable. These features contribute to carbon storage, shelter, and overall landscape resilience.
- **Sustainability Awareness:** Climate considerations, including emissions reduction and climate resilience, shall be integrated into day-to-day agricultural management and decision-making.
- **Agricultural Scheduling and Weather Resilience:** Farming activities such as slurry spreading, grazing management, and land works shall be planned with regard to prevailing and forecast weather conditions, avoiding periods of heavy rainfall or extreme weather where practicable.
- **Hot and Cold Weather Management:** Measures shall be in place to protect animal welfare and maintain operational continuity during periods of extreme heat or cold,

including provision of shelter, ventilation, bedding management, and alternative water or feeding arrangements where required.

- **Emergency Power Supply:** Backup generators or battery systems shall be available on site to maintain critical agricultural processes and animal welfare systems during power outages.

9.11.3 “Worst Case” Scenario

Worst case estimates have been used as part of this assessment. As a result, Section 9.10 details the worst-case impact for the Proposed Development.

9.12 Residual Impacts

The Proposed Development will result in some impacts to climate through the release of GHGs. ISEP (2022) state that the crux of assessing significance is “not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050”. The Proposed Development has proposed some best practice mitigation measures and is committing to reducing climate impacts where feasible. As per the assessment criteria in section 9.6.4.4 the impact of the Proposed Development in relation to GHG emissions is considered **long-term, minor adverse and not significant**.

In relation to climate change vulnerability, it has been assessed that there are no significant risks to the Proposed Development as a result of climate change.

9.13 Risk of Major Accidents or Disasters

As detailed in Section 9.10.3.1, climate change could shift weather patterns and lead to more frequent rainfall in the coming years. Nonetheless, a thorough review of the potential flood risk at the site has been conducted, and sufficient measures for attenuation and drainage have been incorporated to address increased rainfall. The Proposed Development has been evaluated as having a low susceptibility to climate change-related hazards, with no major risks identified. Consequently, the impact is considered direct, long-term, negative, and imperceptible, and is therefore not deemed significant in terms of the Environmental Impact Assessment (EIA).

9.14 Monitoring

9.14.1 Construction Phase

We recommend the following monitoring strategies to ensure compliance with the environmental objectives outlined in this EIA. These strategies are essential for effectively managing the environmental impacts associated with the construction and reinstatement phases, with a particular focus on resource recovery, waste management, and the reduction of GHG emissions.

Monitoring of Reinstatement Waste Reuse and Recycling

To optimise the reuse and recycling of reinstatement materials, we recommend implementing the following:

- **Material Reuse Tracking System:** A digital tracking system could be established to monitor materials identified for reuse or recycling. This system will log details such as quantities, conditions, and intended applications within the new construction areas. It is important that this system is regularly updated to reflect ongoing recovery efforts.
- **Regular On-Site Inspections:** It is suggested that regular inspections are conducted to verify that materials earmarked for reuse are being properly stored and handled. These inspections should ensure that materials remain in suitable condition for their intended use in the new build areas.

Monitoring of GHG Emissions Reduction Measures

To mitigate the Proposed Development's impact on climate change, the following monitoring activities are proposed:

- **Appoint sustainability champions** to ensure that the Proposed Development continues to perform in a sustainable manner including monitoring and reporting of performance on site.
- **Idle Time Monitoring for Vehicles and Machinery:** It is suggested that GPS or telematics systems are installed on all vehicles and machinery used on-site to monitor engine idling times. Automatic alerts should be set up to notify site managers when idling exceeds a specified threshold, enabling prompt corrective action to reduce unnecessary emissions.
- **Maintenance Logs for Plant and Machinery:** Implementing a digital maintenance log system to track the inspection and maintenance of all on-site equipment is recommended. This system should record inspection dates, maintenance activities, and any identified issues, ensuring that all machinery operates efficiently and with minimal emissions.
- **Material Waste Minimisation Tracking:** A monitoring system should be developed to track material orders and usage. This system should identify trends in over-ordering or inefficient material use, enabling the project team to take corrective actions that will help minimise the embodied carbon footprint of the site.

Application of Waste Hierarchy

To optimise waste management on-site, the following monitoring protocols are suggested:

- **Waste Segregation Audits:** Regular audits should be conducted to ensure that waste is being properly segregated according to the waste hierarchy (reduce, reuse, recycle). These audits will help identify opportunities for improving waste management practices and reducing overall waste generation.
- **Monthly Waste Management Reports:** It is suggested that monthly reports are generated detailing the volume of waste reduced, reused, and recycled. These reports should be compared against predefined targets to assess the effectiveness of the waste management strategies and to identify areas for improvement.

Local Sourcing of Materials

To reduce transport-related emissions and support local suppliers, the following measures are suggested:

- **Supplier Distance Monitoring:** A database of suppliers should be developed, documenting the distance of each supplier from the construction site. This database should be used to monitor and minimise the carbon footprint associated with material transportation, prioritising local suppliers wherever possible.
- **Transport-Related Carbon Footprint Analysis:** Conducting a carbon footprint analysis for the transportation of all materials to the site is recommended. This analysis should inform the selection of suppliers, with a preference for those within a closer radius to reduce CO₂ emissions.

These monitoring recommendations are designed to ensure that the Proposed Development adheres to its environmental commitments, particularly in the areas of resource recovery, waste management, and greenhouse gas emissions reduction. By implementing these strategies, the Proposed Development will not only comply with regulatory requirements but also contribute to broader environmental sustainability goals. Regular reporting, on-site inspections, and third-party audits will be critical to maintaining compliance and achieving the desired environmental outcomes.

Monitoring of resource definition and extraction planning

To optimise the extraction materials, we recommend implementing the following:

Resource Modelling and extraction planning: The use of resource optimisation and scheduling tools will help to clearly identify economically viable deposits and the stages for extraction, help to minimise overburden movement and double handling. This can then provide a clear picture of areas requiring vegetation removal and those suitable for rehabilitation which also budgeting for both operational and capital expenditures, as well as the estimated CO₂ impact of the plan. This can significantly improve how deposits are planned and extracted, thereby maximising net present value (NPV). Additionally, it is essential to baseline the extraction operations, assess how improved resource definition and extraction scheduling/planning will enhance sustainability, and provide estimates on how CO₂ emissions (kilograms per tonne) will be reduced accordingly.

Environmental Management Systems

Implement an Environmental Management Plan that incorporates adaptive management principles. Ensure climate change resilience plans are robust, monitoring of trends in weather events is undertaken and periodic reviews of resilience measures related to interdependencies and carried out.

We further recommend the following monitoring strategies to ensure that the proposed development meets its environmental objectives. These strategies focus on mitigating the impacts of climate change, enhancing energy efficiency, and promoting sustainable transport, all of which are aligned with best practices outlined in ISEP guidelines.

To ensure the proposed development effectively mitigates the impacts of future climate change, we recommend the following monitoring strategies:

Monitoring of Sustainable Transport Initiatives

To promote sustainable transport and reduce transport-related emissions, we recommend the following monitoring strategies:

- **Sustainable Procurement:** Ensure all new site machinery and vehicles are the most sustainable option prior to purchase. Consider hybrid and electric technology to accelerate decarbonisation in this area.
- **Low-emission vehicles/fuels (LEV):** Review and assessment of low carbon vehicle technology and fuel usage onsite in comparison to regular fossil fuel operated vehicles to determine changes in site emissions profile and opportunities for decarbonisation.

These monitoring recommendations are designed to ensure that the development's climate change mitigation measures and sustainable transport provisions are effectively implemented and maintained throughout the lifecycle of the Proposed Development. By adhering to these strategies, the development will not only comply with relevant regulatory requirements but also contribute to broader environmental sustainability goals. Regular inspections and stakeholder engagement will be crucial to achieving the desired environmental outcomes.

9.14.2 Operational Phase

The following monitoring strategies are recommended to ensure that the proposed development meets its environmental and climate objectives during the operational phase. The strategies focus on verifying the effective implementation of climate mitigation and adaptation measures associated with agricultural land use, energy efficiency, and climate resilience, and are aligned with recognised best practice and relevant ISEP and Teagasc guidance.

Monitoring of Agricultural Climate Mitigation Measures

- **Livestock and Land Management Review:** Periodic reviews of stocking rates, grazing regimes, and land management practices shall be undertaken to ensure consistency with sustainable land-use objectives and to minimise emissions intensity, soil degradation, and indirect climate impacts.
- **Soil and Grassland Condition Monitoring:** Ongoing visual assessment of soil structure, ground cover, and grassland condition shall be undertaken to confirm that permanent pasture is being maintained where practicable and that excessive soil disturbance is avoided.
- **Nutrient Management Oversight:** Nutrient management practices, including slurry and fertiliser application rates, timing, and methods, shall be periodically reviewed to ensure alignment with soil nutrient status and best practice, thereby minimising nitrous oxide emissions and nutrient losses.

Energy Use and Farm Operations Monitoring

- **Energy and Fuel Use Review:** Energy consumption and fuel use associated with farm machinery and on-site operations shall be periodically reviewed to identify opportunities for improved efficiency and reduced emissions.

- **Vehicle and Machinery Practices:** Observational monitoring shall be undertaken to ensure that idling reduction measures and efficient machinery operation are being implemented as part of routine farm management.

Landscape and Drainage Monitoring

- **Hedgerow and Boundary Feature Management:** Existing hedgerows, trees, and field boundaries shall be periodically inspected to ensure their continued retention and appropriate management, supporting carbon storage and climate resilience.
- **Drainage and Runoff Controls:** Drainage features and runoff pathways shall be inspected periodically and following significant rainfall events to ensure effective functioning, prevent erosion, and reduce indirect climate impacts associated with soil and nutrient loss.

Climate Adaptation and Resilience Monitoring

- **Weather-Responsive Farm Operations:** Agricultural activities shall be reviewed on an ongoing basis to confirm that scheduling remains responsive to prevailing and forecast weather conditions, particularly in relation to slurry spreading, grazing management, and land works.
- **Extreme Weather Preparedness Review:** Measures for managing periods of extreme heat or cold, including animal shelter, water availability, and ventilation, shall be periodically reviewed to ensure continued effectiveness and animal welfare protection.
- **Emergency Power Systems Testing:** Backup power systems shall be inspected and tested at appropriate intervals to ensure that critical agricultural operations and animal welfare systems can be maintained during power outages.

Review of Climate Risk and Adaptive Management

- **Climate Risk Review:** Climate risks and vulnerabilities shall be periodically reviewed in light of emerging climate information and operational experience to ensure that mitigation and adaptation measures remain appropriate.
- **Adaptive Management:** Where practicable, new or improved agricultural climate mitigation measures that become available and are suitable to the scale and nature of the operation shall be considered for implementation.

9.15 Interactions

Climate interactions with various environmental topics are extensive and significant, highlighting the broad effect of climate factors across different aspects of the environment. The “avoidance, remediation and mitigation” section of this chapter outlines effective management and reduction measures for the following identified interactions.

One of the most critical interactions is between climate and GHG emissions. The Proposed Development’s carbon footprint, including emissions from construction and operational activities, energy use, transportation, and agriculture play a role in influencing climate change. Effective management and reduction measures for these emissions are outlined in the mitigation section to support climate resilience and regulatory compliance.

Population and Human Health

Human health and well-being are closely linked to climate factors. Climate change can exacerbate health issues such as heat stress, respiratory conditions, and vector-borne diseases. While the Population and Human Health chapter focuses on direct health determinants, the Climate Chapter also considers indirect pathways through which climate-related measures may influence public health. These include:

- Air quality impacts from construction and operational traffic/vehicles/machinery, which are addressed in parallel with climate assessment;
- Noise and vibration disturbance, particularly in relation to sensitive receptors such as residential dwellings;
- Sustainable farming practices, which contributes to improved air quality, and enhanced visual impact;
- SuDS and water management systems, which reduce flood risk and associated health hazards; and
- Traffic emissions, which were assessed using DMRB LA 114 criteria for both construction and operational phases, confirming no significant climate-related health effects

These measures support climate resilience and help safeguard public health in the context of a changing climate.

Biodiversity

Climate change can alter habitat conditions, encourage spread of invasive species, disrupt species distributions, and affect ecological balances. These shifts may impact local flora and fauna, particularly in sensitive coastal and estuarine environments adjacent to the Proposed Development.

The Biodiversity chapter outlines a suite of mitigation and enhancement measures that directly support climate resilience, including:

- Retention of native tree and hedgerow species.
- Sustainable drainage systems (SuDS) to manage water quality and quantity; and
- Lighting design to reduce disturbance to nocturnal species.
- Long-term habitat management, including for the prevention of the introduction and spread of invasive species.
- Biodiversity measures listed above and included within the biodiversity chapter align with national and EU climate adaptation strategies, contributing to broader goals such as carbon neutrality, nature-based solutions, and ecosystem-based adaptation. Such strategies include:
 - CAP25 explicitly supports a transition to a biodiversity-rich, climate-resilient, and environmentally sustainable economy
 - National Adaptation Framework (NAF) 2025, which identifies biodiversity as a priority sector for climate adaptation, promotes ecosystem-based adaptation and nature-based solutions to address climate risks such as flooding, drought, and habitat loss, and encourages local and sectoral adaptation plans to integrate biodiversity and climate resilience.

- EU Adaptation Strategy (2021 Update) which emphasizes nature-based solutions (NbS) as a key cross-cutting priority. Supports ecosystem restoration, urban greening, and coastal protection as climate adaptation tools, and promotes integration of NbS into urban planning, water management, and disaster risk reduction.
- EU Biodiversity Strategy 2030 which aims to restore at least 30% of degraded ecosystems by 2030. Recognizes biodiversity as essential for climate mitigation and adaptation, and supports green infrastructure and ecological connectivity to enhance resilience.

These measures contribute to carbon sequestration, ecological connectivity, enhancing the site's resilience to climate change and supporting long-term biodiversity conservation.

Land and Soils

Climate change can affect soil moisture, erosion rates, and land productivity. Increased rainfall may lead to soil erosion, while extended dry periods can degrade soil quality. The Proposed Development includes mitigation measures to manage these risks.

As mentioned in the Land and Soils Chapter (Chapter 6) the operational phase of the Proposed Development will involve the importation of soil and stone to the site to restore 2.92ha of the total site, which will be sourced from local development sites and their subsequent spreading and infilling. In relation to climate, the infilling and restoring of the land to a more natural state provides several benefits, including improved soil drainage, enhanced potential for biodiversity, and improves carbon sequestration.

As documented in the Outline Construction Environmental Management Plan (Lenztech, 2023), carried out by Lenztech Surveying & Engineering Ltd. on behalf of BM Lynch Construction & Civils, the development is designed to facilitate the recovery of excavated inert soil and stone (by-product) from local greenfield residential development sites and proposes the infilling with an estimated maximum volume of 50,250m³ (85,000 tonnes).

The Outline Construction Environmental Management Plan (OCEMP) outlines procedures for managing soil stockpiles, preventing dust generation, and controlling runoff, all of which are critical in the context of climate variability.

No significant adverse effects are anticipated during the operational phase, and the site will be suitable for long-term residential and commercial use.

Hydrology and Hydrogeology

Climate variability, such as increased rainfall or prolonged droughts, can affect water availability, quality, and management practices. This includes effects on stormwater runoff, flood risk, and water supply. The Hydrology Chapter outlines the Proposed Development's water management strategies, including SuDS, attenuation systems, and flood resilience measures, ensuring robustness against future climate scenarios.

Air Quality

Air quality and climate are interrelated due to shared sources of emissions, particularly from the combustion of fossil fuels during both the construction and operational phases. These

activities generate pollutants that contribute to both local air quality impacts and global climate change. The air quality assessment was undertaken in parallel with the climate assessment to ensure consistency in evaluating emissions and their potential impacts.

Material Assets: Waste and Utilities

Waste management strategies, including prevention, reuse, recycling, and recovery, are aligned with national and EU circular economy policies, supporting the minimisation of waste generation and the maximisation of resource efficiency. These measures contribute to climate mitigation by reducing emissions associated with waste disposal and energy consumption. Furthermore, the adoption of Sustainable Drainage Systems (SuDS) and efficient water management practices helps to manage surface water runoff and reduce potential climate-related vulnerabilities, such as flooding. The direct and indirect effects of these infrastructure and operational choices on climate, including GHG emissions and resilience to climate change, are assessed in detail within the climate chapter.

Archaeology and Cultural Heritage

Cultural heritage sites are at risk due to climate change, with increased weathering, flooding, and temperature fluctuations potentially accelerating their deterioration. Mitigation measures employed at the Proposed Development will ensure that no significant impacts occur.

Material Assets: Traffic

Traffic-related emissions are a key contributor to climate change. The UK Highways Agency's DMRB guidance document LA 114 (2019) outlines criteria for determining whether a detailed climate assessment is required. These include:

- A change of more than 10% in Annual Average Daily Traffic (AADT);
- A change of more than 10% in the number of heavy-duty vehicles; or
- A change in daily average speed of more than 20 km/hr

The AADT will not increase by more than 10% nor will a change in average speed limit of more than 20km/hr occur in any of the road links as a result of the proposed development.

However, Heavy-Goods Vehicles (HGV) shall increase from 54 to 65 in the opening year (2027), an increase of 8 no. HGVs or 15%. As a result, a detailed assessment of traffic related CO₂ emissions was conducted see table 9-2. Further details are provided in Chapter 8 Air Quality. The direct effects of these traffic related emissions on climate, including GHG emissions, monitoring and mitigation are assessed in detail within the climate chapter

In summary, the Proposed Development's interactions with climate encompass a range of factors including GHG emissions, water resources, biodiversity, soil, human health, and cultural heritage. Effective mitigation strategies and robust monitoring will be essential to address these interactions, minimise adverse effects, and ensure the development's resilience to climate change.

9.16 Difficulties Encountered When Compiling

Overall, there were no major difficulties encountered when compiling this assessment. Minor difficulties were encountered during the quantification of materials at the design stage in order to assess the embodied construction carbon. The exact volumes of materials, location of waste disposal sites, sourcing of products and technical specification for materials are finalised during the detailed design phase and by the appointed contractor. Throughout the assessment, efforts have been made to provide the most likely scenario of the embodied carbon assessment. Where it is required to make assumptions as the basis of the assessment presented here, these assumptions are based on advice from competent project designers and are clearly outlined within the chapter.

This is a standard and expected approach at this early stage, and assessment is appropriate on this basis.

9.17 Conclusion

The assessment of potential adverse effects resulting from the Proposed Development on climate change in this chapter has identified the potential sources of greenhouse gas emissions and vulnerability of the site to climate change.

It is reasonably considered that following all mitigation measures including design embedded and prescribed, adequate implementation of construction phase mitigation, and adherence to operational best practice that no significant effects to climate change will arise from the Proposed Development during the construction or operational phases.

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10 NOISE AND VIBRATION

10.1 Introduction

This chapter of the EIAR provides a description and assessment of the likely effect of the Proposed Development from noise and vibration.

This chapter discusses the existing ambient noise levels at nearby sensitive receptors, the potential effects of the Proposed Development on the existing ambient noise environment and the mitigation measures that will be employed to reduce or eliminate any potential effects.

This assessment will examine the likely effects of sound pressure levels generated by the Proposed Development located at Kyletalesha, Portlaoise, Co.Laois. Noise calculations have been used to predict and assess the likely effect of facility operations on noise sensitive receptors.

10.1.1 Quality Assurance and Competency of Experts

This chapter of the EIAR has been prepared by Wave Dynamics Limited (hereinafter referred to as 'WDA') an Acoustic Consultancy specialising in noise and vibration.

The EIAR chapter was prepared by Cathal Reck, Acoustic Consultant. Cathal has experience of numerous similar planning stage EIAR noise and vibration assessments. Cathal holds a BSc (Hons) in Music Technology and Production, Institute of Acoustics (IOA) Certificate of Competence in Environmental Noise Measurement and a Certificate in Building Acoustics and Noise Control. Cathal is a member of the Institute of Acoustics (TechIOA) and a (SITRI) Sound Insulation Testing Register certified sound insulation tester.

This chapter was peer reviewed by James Mangan, Director (Acoustics) at Wave Dynamics. James is an acoustician with over 25 years' experience, including 21 years in the Irish and Northern Irish markets. James is a member of the Institute of Acoustics (MIOA) and has completed the Institute of Acoustics (IOA) Diploma in Acoustics and Noise Control. He has worked on a wide range of projects, including commercial, residential, infrastructural and renewable EIARs, commissioning, and complaint investigations, as well as numerous building acoustics projects such as offices, hotels, and auditoria. James is former Chairman of the Irish Branch of the IOA.

10.2 Study Methodology

The assessment of noise and vibration effects associated with the Proposed Development has been undertaken with reference to the most appropriate guidance documents relating to environmental noise and vibration which are set out within the relevant sections of this chapter. In addition to specific noise guidance documents, the following guidelines were considered and consulted for the purposes of this chapter:

- Design Manual for Roads and Bridges Volume 11 Section 3 Part 7 (HD 213/11 – Revision 1) (The Highways Agency et al., 2011);
- BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise;

- BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Vibration;
- BS 7385: 1993: Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration;
- ISO 1996-1:2016 Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment procedures;
- ISO 1996-2:2017 Acoustics - Description, measurement and assessment of environmental noise Part 2: Determination of sound pressure levels;
- ISO 9613-1:1993 Acoustics - Attenuation of sound during propagation outdoors -- Part 1: Calculation of the absorption of sound by the atmosphere;
- ISO 9613-2:1996 Acoustics - Attenuation of sound during propagation outdoors -- Part 2: General method of calculation;
- British Standard BS 6472-1:2008 Guide to evaluation of human exposure to vibration in buildings;
- Environmental Protection Agency (2016) Guidance Note for Noise (NG4): Licence Applications, Surveys and Assessments in Relation to Scheduled Activities;
- BS 4142:2014+A1:2019: Methods for rating and assessing industrial and commercial sound;
- Guidelines for the Treatment of Noise & Vibration in National Road Schemes, National Roads Authority, Revision 1, 25th October 2004;
- Laois County Council Noise Action Plan 2024-2028;
- NRA Traffic Grid Flow Pattern;
- Calculation of Road Traffic Noise (CoRTN): 1998;

The noise and vibration study has been undertaken using the following methodology:

- A baseline environmental noise survey has been undertaken on, and in the vicinity of, the Proposed Development site in order to characterise the existing baseline noise environment and to assess the character of the existing noise;
- A review of the most applicable standards and guidelines has been conducted in order to set a range of acceptable noise and vibration criteria for the construction and operational phases of the Proposed Development;
- Predictive statistical calculations have been performed for during the construction phase of the project at the nearest sensitive locations to the Proposed Development site;
- Predictive modelling using SoundPlan 9.1 and statistical calculations have been performed to assess the potential effects associated with the operational phase of the Proposed Development at the most sensitive locations surrounding the Proposed Development site; and
- Mitigation measures have been proposed to reduce, where necessary, the identified potential outward effects relating to noise and vibration from the Proposed Development.

10.3 The Existing and Receiving Environment (Baseline Situation)

A baseline noise survey was conducted to assess the baseline noise situation at the Proposed Development site located at Kyletalesha, Portlaoise, Co. Laois. The purpose of the survey was to quantify the existing noise environment and to predict the future effect the Proposed Development may have on the surrounding area.

An attended noise survey was conducted to quantify the existing noise environment. The attended measurements were taken on the 16th of December 2025 between 06:00hrs and 09:00hrs, to capture the noise climate during both the daytime and nighttime periods. Noise sensitive locations have been identified as part of the baseline noise survey and additionally, LENZTEC Surveying and Engineering Ltd have conducted a desktop review of the surrounding area and outlined additional noise sensitive receptors on an ordinance survey map outlined in Figure 10-2.



Figure 10-1: Site Location, Measurement Location A1, Noise Sensitive Locations, and the Surrounding Area.

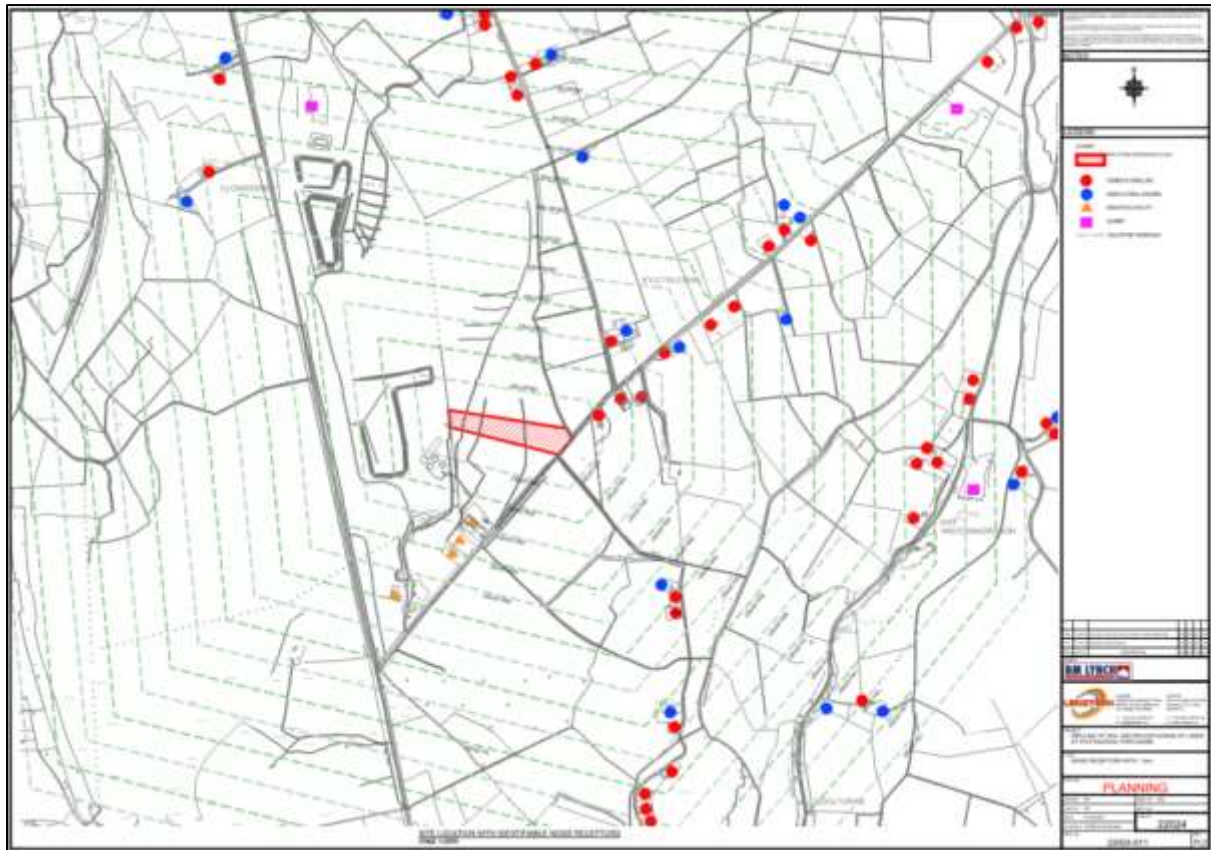


Figure 10-2: LENZTEC Noise Sensitive Location Markup.

10.3.1 Survey Methodology and Personnel

The attended noise survey was completed by Daniel Cousins (Operations Manager) on the 16th of December 2025.

10.3.1.1 Attended Noise Measurements

Noise measurements were undertaken in general accordance with ISO 1996-1:2016 using ISO Class 1 sound analysers. Attended measurements were taken for durations of 10-30 minutes in the locations A1 as illustrated in Figure 10-1.

Care was taken to avoid any effect on the measurement of extraneous noise, acoustic vibration, or interference. During the attended noise measurements, the sound level meter was positioned at approximately 1.5m above the ground level as outlined in Figure 10-3. The weather conditions were calm (wind less than 5m/s) with no rain, a wind shield was used for the duration of the attended surveys. The noise logger was calibrated before and after the survey and no significant drift was noted.



Figure 10-3: Attended Measurement Location A1.

10.3.2 Survey Period

The attended noise measurement survey was undertaken from 06:00hrs and 09:00hrs on the 16th of December 2025.

10.3.3 Subjective Noise Environment

During the attended survey the following noise sources were noted:

- Road traffic noise from the N80 and R2117.
- Birdsong.

10.3.4 Noise Measurement Equipment

A Class 1 sound level meter/noise logger in general accordance with IEC 61672-1:2013 was used for the attended and unattended measurements. Table 10-1 summarises the measurement equipment used.

Table 10-1 Noise Measurement Equipment Used for the Attended and Unattended Surveys.

Description	WD Number	Asset	Model	Serial No.	Calibration Certificate No.	Calibration Due Date
Sound Level Meter	SLM 11		NTI XL3	A3A-01753-F0	UCRT25/1878	12/06/2027
Calibrator	CAL4		Larson Davis CAL200	21085	AC250309	22/07/2026

10.3.5 Noise Measurement Results

Attended measurements were taken to measure the existing noise climate in the area. This section outlines the results of both the attended and unattended noise measurements.

10.3.5.1 Attended Measurement Results

Table 10-2 illustrates the results of the attended noise measurement survey conducted on the 16th of December 2025.

Table 10-2 Attended Measurement Results

Measurement					Measurement Noise Levels		
Location		Date	Time (hrs)	Duration (mins)	L _{Aeq} dB	L _{AFmax} dB	L _{A90} dB
A1	(53.0740084, -7.3172861)	16/12/2025	06:22	15	46	65	40
A1	(53.0740084, -7.3172861)	16/12/2025	06:35	15	47	63	42
A1	(53.0740084, -7.3172861)	16/12/2025	06:50	10	48	64	42
A1	(53.0740106, -7.3173049)	16/12/2025	07:12	30	51	67	44
A1	(53.0740106, -7.3173049)	16/12/2025	07:42	30	52	68	46
A1	(53.0740106, -7.3173049)	16/12/2025	08:12	30	52	68	46

10.3.5.2 Discussion of Measurement Results

The ambient noise consisted of traffic noise from the road network in the surrounding area.

10.3.6 Weather Conditions for Monitoring Period

Good weather conditions were noted in general during the deployment and collection during the attended survey, with winds of less than 5 m/s and no rain for the attended surveys.

10.4 Characteristics of the Proposed Development

The Proposed Development site as shown in Figure 10-1, comprises an elongated land parcel with a total area of 2.92 hectares, located at Kyletalesha, Portlaoise, County Laois, within the eastern extent of the Clonreher Bog peatland. The site lies approximately 2.57 kilometres north of Portlaoise town centre and is located between Portlaoise to the south-east and Mountmellick to the north-west.

Access to the Proposed Development site is gained from the south-east entrance via an existing local gravel access lane leading from the L2117 Local Primary Road. This access forms part of an established private entrance, which is shared with adjoining third-party lands

located to the north. The L2117 joins with the National Secondary Route, the N80, at a controlled junction located approximately 900m south west of the site.

The lands comprising the Proposed Development site consist of Cutover bog. Although the precise historical land-use is not documented, it is considered likely that limited, non-commercial peat extraction took place on the lands in the past.

The ground is wet in nature and is characterised by an overgrowth of self-seeded trees and ground vegetation that has established over time following the cessation of peat-related activity. The existing ground conditions currently render the lands unsuitable for agricultural use and pose risks to both farm machinery and livestock. In relation to topography, the ground levels are below the L2117 Local Primary Road level and decline gradually in a westerly direction, with a number of field drains present throughout the site.

The lands immediately adjoining the Proposed Development site to the north and west, consist of a combination of uncultivated land and areas of existing industrial activity. Lands directly to the west of the Proposed Development site comprise agricultural lands associated with established dairy and beef farming enterprises.

Approximately 750 metres southwest of the Proposed Development site is the former Portlaoise Landfill facility, which now functions as a recycling centre. A number of industrial and waste-related facilities are located approximately 400 metres west of the Proposed Development, each operating under existing waste licences and include:

- AES Recycling Centre Portlaoise;
- Charlie Lawless & Sons;
- Jonathan Ward Ltd Bulk Waste Transport;
- John Styles & Sons and;
- Portlaoise Waste & Recycling Facility.

The wider area has an established history of waste-related activities. In contrast, the Proposed Development involves the recovery and beneficial reuse of a by-product generated from the construction sector. Upon completion, the recontoured landform is expected to provide an improvement on the current land condition.

A comprehensive description of the Proposed Development is presented in Chapter 2 of this EIAR.

10.5 Potential Impact of the Proposed Development

10.6 Potential Effect of the Proposed Development

This section outlines the potential effect of the Proposed Development on the surrounding area.

10.6.1 Construction Phase

10.6.1.1 Construction Phase Noise

LCC have not outlined specific construction noise limits within the Laois Council Noise Action Plan 2024 – 2028, therefore, noise limits outlined in BS5228-1:2009+A1 have been adopted as the criteria for the Proposed Development as BS5228-1:2009+A1 is the defacto standard for assessing construction noise. BS5228-1 takes into consideration the effect of the ambient noise at the noise sensitive receptor as follows in Table 10-3:

Table 10-3 BS5228 Threshold Levels

Assessment category and threshold value period	Threshold value, in decibels (dB) (L_{Aeq})		
	Category A ¹	Category B ²	Category C ³
Daytime (07:00 – 19:00) and Saturdays (07:00 – 14:00)	65	70	75
Evenings and weekends ⁴	55	60	65
Night-time (23:00 – 07:00)	45	50	55

- 1) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.
- 2) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as category A values.
- 3) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than category B values.
- 4) 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sunday

BS5228 defines a noise sensitive location as:

“any occupied premises outside a site used as a dwelling (including gardens), place of worship, education establishment, hospital or similar institution, or any other property likely to be adversely affected by an increase in noise level”.

10.6.1.1.1 Construction Phase Noise Limits

This section outlines the predicted construction noise and vibration effect of the Proposed Development on the surrounding sensitive locations.

The criteria for the Proposed Development are based on the criteria outlined in Table 10-3 and the background noise in the area. The construction noise criteria are outlined in Table 10-4, with distance to the NSLs based on the closest receiver at each NSL. NSL reflects a number of houses/sensitive receivers at each NSL.

Reference is made to the baseline survey results and guidance contained in BS 5228-1, which sets threshold levels for significant effects from construction activities. These thresholds are applied to the closest NSLs.

Table 10-4 Construction Noise Limits

Noise Location	Sensitive	Distance to the Centre of the Site (m) ²	Ambient Noise L_{eq} dB(A)	Noise Limit dB(A) L_{eq} ¹
NSL1 – Residential		205	51	65

Noise Location	Sensitive	Distance to the Centre of the Site (m) ²	Ambient Noise dB(A) L _{eq}	Noise Limit dB(A) L _{eq} ¹
NSL2 – Residential		285	51	65
NSL3 – Residential		355	51	65
NSL4 – Residential		700	51	65

1) 65 dB (A) lower threshold limit.

2) Distance taken from the centre of the closest construction area to each NSL, based on current site layout drawings.

For the appropriate assessment period (i.e. daytime in this instance due to the nature of construction working hours) the ambient noise level is determined and rounded to the nearest 5dB. If the noise generated by construction activities exceeds the appropriate category value, then a significant effect is deemed to occur.

10.6.1.1.2 Noise Predictions

The construction phase will begin with clearing self-seeded vegetation and partial removal of northern and eastern roadside hedges to facilitate access. While the peatland site lacks internal fencelines, existing boundary planting and drainage infrastructure will be retained where possible. Preparatory works include:

- Installing temporary fencing and buffer strips.
- Constructing a Temporary Construction Compound (TCC).
- Widening the existing 3.1m access road to 6.5m using granular capping and either concrete or bitumen surfacing.

An 11.5m² TCC will be established by stripping topsoil and installing a geotextile membrane with imported stone. It will support:

- Facilities: Modular offices, welfare units, and secure storage.
- Services: On-site generators for power, bottled water/bowsers for supply, and sealed waste storage for off-site removal.
- Operations: Parking, vehicle monitoring, and a best-practice fuelling point.
- Drainage: Runoff from the TCC will be managed via swales or infiltration areas to protect existing ditches.

Once the infilling stages are complete, the TCC area will be reinstated by removing imported stone/geotextile, ripping the substrate, and replacing stored soils for reseeded. Alternatively, if ground conditions permit, the stone base may be left in situ and covered with soil to allow for potential reuse during future decommissioning.

As the works are transient the location of the works has been taken as an average location as is outlined in BS5228-1:2009+A1. The prediction methodology in BS 5228 has been used to calculate the noise level over a typical day for each of the main construction stages.

The closest noise sensitive receptor is NSL1 to the east of the Proposed Development, NSL1 and the remaining sensitive receptors are outlined in Figure 10-1.

Table 10-5 Proposed Construction Equipment, Noise Levels, and Durations

Construction Phase	Item of Plant (BS 5228-1:2009+A1:2014 Ref)	Noise Level (L_{Aeq} at 10m dB(A))	On Time of a 10 hr day
Site Setup	Excavator	77	4 Hours
	Tipper Lorry	79	3 Hours
	Compact Roller	73	4 Hours
	Bulldozer	75	4 Hours
Road Widening	Excavator	77	4 Hours
	Tipper Lorry	79	3 Hours
	Compact Roller	73	4 Hours
	Asphalt Paver	75	4 Hours

Table 10-6 summarises the predicted construction noise level at the NSLs. Examination of the results indicate the construction noise without mitigation is predicted to exceed the noise limits during all construction stages of the Proposed Development.

Table 10-6 Predicted Noise Levels Without Mitigation for Each Stage

Location	Noise Limit	Predicted noise level (construction noise + ambient) with no mitigation L_{Aeq} , dB	
		Site Set Up	Road Widening
NSL1	65	55	55
NSL2	65	54	54
NSL3	65	53	53
NSL4	65	52	52

The calculations set out in Table 10-7 are based on assumed site construction works and a combination of the plant operating at the same time i.e. a worst-case scenario. While this may not reflect actual site conditions, the assessment has been carried out on a conservative basis. Table 10-7 outlines the required attenuation for the construction stage.

Table 10-7 Attenuation Required at Each Stage Based on the Construction Noise Predictions

Location	Noise Limit	Noise reduction required at each stage of works to meet criteria (dBA)	
		Site Set Up	Road Widening
NSL1	65	0	0
NSL2	65	0	0

Location	Noise Limit	Noise reduction required at each stage of works to meet criteria (dBA)	
		Site Set Up	Road Widening
NSL3	65	0	0
NSL4	65	0	0

The assessment considers distances measured from the centre of the nearest construction area grouping to each NSL. However, it is acknowledged that some construction activities will occur closer to the site boundaries, potentially resulting in higher noise levels at the sensitive receptors. Therefore, noise mitigation measures are recommended throughout all stages of construction to control noise and vibration emissions during the construction phase. A combination of the mitigation measures outlined in Section 10.7.1.1 shall be implemented to control construction noise levels at the NSLs.

10.6.1.1.3 Traffic from Construction Vehicles

This section outlines the potential noise effect from construction vehicles on the surrounding road network.

According to figures and information provided by the design team, and outlined in Chapter 13: Material Assets: Traffic and Transport, which states that the infilling site is expected to be operational for 5 years with a total of 85,000 tonnes of infill material being transported to the site during the operational period, this equates to ca. 17,000 tonnes per year and 354 tonnes per week which will generate 4 no. two-way HGV movements per operational day. Based on the existing traffic figures on the surrounding road network, the traffic levels will not increase by more than 25% which would equate to an increase of 1dB in traffic noise levels. Therefore, there will be no additional noise effect from construction vehicles. Table 10-8 outlines the magnitude of effects associated with changes in traffic noise levels.

Table 10-8 Magnitude of Effects

Noise Change, dB	Magnitude of Impact
0	No Change
0.1 – 2.9	Negligible
3 – 4.9	Minor
5 – 9.9	Moderate
10+	Major

10.6.1.2 Construction Phase – Vibration

The LCC Noise Action Plan does not contain guidance relating to vibration limits. Best practice guidance is taken from British Standard BS 5228:2009+A1 2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 2 Vibration.

The standard recommends that for a soundly constructed residential property and similar structures (in good repair), the threshold for minor or cosmetic (i.e. non-structural) damage

should be taken as a Peak Particle Velocity (PPV) (in frequency range of predominant pulse) of 15mm/s at 4Hz increasing to 20mm/s at 15Hz and 50mm/s at 40Hz and above. Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration is outlined in Table 10-9:

Table 10-9 Allowable Vibration Limits

Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of:			
Building Type	Less than 15Hz	15 to 40Hz	40Hz and above
Light framed structures/ residential buildings	15 mm/s	20 mm/s	50 mm/s

10.6.1.2.1 Construction Vibration Predictions

Vibration effect is not anticipated for most of the construction stage, some vibration is expected to be generated during the road widening phase of the development. During this phase, compliance with vibration criteria is evaluated using a combination of measured data and general estimates, as predicting vibration effects over distance is challenging due to variations in soil composition and ground conditions. While precise predictions are difficult to achieve, general estimates based on measured vibration levels at specific distances, as outlined in BS 5228-2, provide a practical method for assessing potential effects, as outlined in Table 10-10.

Table 10-10 Allowable vibration limits

Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of:			
Building Type	Less than 15Hz	15 to 40Hz	40Hz and above
Light framed structures/ residential buildings	15 mm/s	20 mm/s	50 mm/s

10.6.2 Operational Phase

10.6.2.1 Operational Phase Noise Limits

The main potential source of operational noise from the Proposed Development is plant and equipment, traffic movements, and the proposed delivery quantities of 1,100 per year.

The LCC Noise Action Plan does not specify any operational noise limits, typically most councils define these in line with guidance from EPA NG4: Guidance Note for Noise: License Applications, Surveys and Assessments in Relation to Scheduled Activities:

- Daytime 55 dB (A) L_{eq} ; and
- Night-time 45 dB (A) L_{eq} (or exceptionally 40 dB (A) L_{eq}).

In order to assist with the interpretation of the noise associated with vehicular traffic on public roads, Table 10-11 offers guidance as to the likely effect associated with any particular change in traffic noise level (Source: DMRB, 2011)

Table 10-11 Magnitude of Impacts

Noise Change, dB	Magnitude of Impact
0	No Change
0.1 – 2.9	Negligible
3 – 4.9	Minor
5 – 9.9	Moderate
10+	Major

10.6.2.1.1 BS 4142: Methods for Rating and Assessing Industrial and Commercial Sound.

The standard describes a method for the assessment of commercial, industrial and background noise to quantify its impact on persons outside of a residential dwelling. BS 4142 has become the de facto standard for compliance investigation. In addition to the specified broadband noise levels the standards provide objective and subjective methods for the assessment of the impulsivity and tonality of the noise sources. This allows for a penalty/correction to be applied to the measured noise level of the source (L_{Aeq}) to give the rating level ($L_{Ar,T}$).

- Typically, the greater this difference, the greater the magnitude of the impact.*
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.*
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.*
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.*

Adverse impacts include, but are not limited to, annoyance and sleep disturbance.

Response to sound can be subjective and is affected by many factors, both acoustic and non-acoustic. The significance of its impact, for example, requires an assessment of context, which can depend on such factors as the margin by which a sound exceeds the background sound level, its absolute level, time of day and change in the acoustic environment, as well as local attitudes to the source of the sound and the character of the neighbourhood.

10.6.2.1.2 EPA NG4: Guidance note to Noise: License Applications, Surveys and Assessments in Relation to Scheduled Activities.

EPA NG4 outlines that noise attributable solely to onsite activities from a licenced premises should not exceed the following limits:

- Daytime (07:00hrs – 19:00hrs) – 55dB $L_{Ar,T}$;
- Evening (19:00hrs – 23:00hrs) – 50dB $L_{Ar,T}$; and
- Nighttime (23:00hrs – 07:00hrs) – 45dB $L_{Aeq,T}$.

“During daytime and evening periods rigorous efforts should be made to avoid clearly audible tones and impulsive noise at all sensitive locations. A penalty of 5dB for tonal and/or impulsive

During the night-time period no tonal or impulsive noise from the facility should be clearly audible or measurable at any NSL."

This section outlines the predicted noise effect of the operational phase of the Proposed Development on the surrounding sensitive locations.

10.6.2.2.1.1 Plant Machinery



Table 10-12 Noise Source Sound Power Levels

Description	Description (BS5228-1 Ref)	Octave Band Sound Power Level L _w dB at Centre Frequency (Hz)								Overall Sound Power Level L _{WA} dB
		63	125	250	500	1000	2000	4000	8000	
Bulldozer	C.2 – 13	102	111	106	102	102	98	95	90	107
Tracked Excavator	C.2 - 2	119	109	101	99	99	100	90	87	105
Dumper	C.4 - 8	96	84	75	77	80	78	69	60	84
Tipper Lorry	C.8 - 20	113	106	105	105	101	99	96	91	107
Weigh Bridge with HGV	Measured	91	88	88	87	86	85	85	84	92
Wheel Wash	Library	88	79	73	69	80	71	72	77	80

10.6.2.2.1.2 Operational Traffic

Operational phase traffic volumes have been provided by the design team in Chapter 13: Material Assets: Traffic and Transport. Table 10-13 outlines the operational traffic volumes for the base year 2024 and the Do-Something years 2027 and 2032.

Table 10-13 Operational Phase Traffic AADT Figures.

Link	Road Name	Road Name	Base Year 2026	Do Nothing		Do Something		Average Speed (kph)	Link Length (km)
				Opening Year 2027	Design Year 2032	Opening Year 2027	Design Year 2032		
B => A	L2117 (S)	AADT %HGV	1,008 5%	1,024 5%	1,083 6%	1,036 6%	1,095 6%	66.1	-
A => B	L2117 (N)	AADT %HGV	1,008 5%	1,024 5%	1,083 6%	1,036 6%	1,095 6%	67.1	-

10.6.2.2.1.2.1 Operational Traffic Predictions

The Design Manual for Roads and Bridges (DMRB) states that a 25% increase in traffic flow typically results in an increase of approximately 1 dB(A) in road traffic noise levels, assuming all other variables remain constant. As shown in outlined in Table 10-13, projected traffic flow increases associated with the Proposed Development under the Do-Nothing and Do-Something scenarios are all well below this threshold. Therefore, the predicted change in traffic noise levels across the study area is expected to be marginally above existing levels.

It is generally accepted that it takes an approximate 3 dB(A) increase in noise levels to be perceptible to the average person (Ref: Planning Policy Guidance Note 24 PPG24 - Planning and Noise).

As such, operational traffic noise levels associated with the Proposed Development will not have a negative effect on NSLs. The magnitude of effect is negligible based on magnitudes of change outlined in Table 10-14.

Table 10-14 Magnitude of Change

Noise Change, dB	Magnitude of Impact
0	No Change
0.1 – 2.9	Negligible
3 – 4.9	Minor
5 – 9.9	Moderate
10+	Major

10.6.2.2.1.3 Car Parking

The Proposed Development will include 2 no. car parking spaces to serve the development. Given the amount of car parking spaces provided, it is anticipated that there will be a **low impact** on the surrounding sensitive receptors.

10.6.2.3 Daytime Noise Effect

As the Proposed Development is proposed to operate during the daytime hours of 08:00hrs – 17:00hrs, a model has been undertaken for the daytime operational situation of the Proposed Development. The operational noise assessment takes into consideration the specific sources operating on the development including the mobile infill plant such as the bulldozer, excavator and dumper trucks, HGV deliveries and static plant such as the wheel wash and weigh bridge.

Traffic and car parking has been assessed separately and found to not have any significant effect on the surrounding sensitive receptors as outlined in Section 10.6.2.2.1.2.1.



Figure 10-5 Screenshot of Model Displaying the Operational Phase Assessment

The daytime (07:00 – 23:00) situation assumes the following noise sources, the assumptions are based on similar other developments and WDAs experience:

- Bulldozer operating 60% of the day between the hours of 08:00hrs – 17:00hrs, based on spectra outlined in Table 10-12.
- Excavator operating 60% of the day between the hours of 08:00hrs – 17:00hrs, based on spectra outlined in Table 10-12.

- Tipping Lorry operating based on deliveries of 1100 per year factored over the daily workday.
- Dumper Truck 60% of the day between the hours of 08:00hrs – 17:00hrs, based on spectra outlined in Table 10-12.
- HGV deliveries in line with Chapter 13: Material Assets: Traffic and Transport figures of 4no. two-way HGV trips per day.
- Wheel wash in line with HGV deliveries.

10.6.2.3.1 BS 4142 Noise Effect Assessment (Daytime 07:00 – 23:00)

The noise effects at the nearest Noise Sensitive Locations (NSL1–NSL4) have been assessed in accordance with the methodology set out in BS 4142:2014+A1:2019, which provides a framework for assessing industrial and commercial sound in relation to background sound levels. In accordance with BS 4142, the daytime period is defined as 07:00 to 23:00 hours, and this time frame has been applied in the assessment of potential noise effects. Table 10-15 outlines the assessment at the closest NSL (NSL1), which is the worst-case receptor due to its proximity to the Proposed Development. All NSLs have been assessed and are predicted to have lower onset noise levels than NSL1.

The residual and background noise levels were taken from the attended measurement positions; this is indicative of all typical noise climates in the surrounding area.

Table 10-15 Noise Effect During Daytime Hours

Results		Relevant BS 4142 Clause	Commentary
Predicted specific sound level (daytime)	L _{Aeq} (30min) = 47dB	7.3.6	As the Proposed Development is not yet existing, noise levels have been predicted using SoundPlan modelling software. Worst case specific sound predicted at NSL1.
Residual sound level (daytime)	L _{Aeq} (30min) = 51dB	7.3.2	The residual sound level was dominated by road traffic noise on surrounding roads. Residual sound from measurement location A1 was assessed as this is representative for worst case receptor NSL1.
Background sound level (daytime)	L _{A90} (30min) = 44dB	8.1.2 8.4	The L _{A90} sound level was measured at the noise sensitive location with the source absent.
Assessment made during the daytime, so the reference time interval is 1 hour		7.2	
Specific sound level as predicted	L _{Aeq} (30min) = 47dB	7.3.6	The specific sound has been predicted by calculation alone as the Proposed Development is not existing at the time of the survey.

Results		Relevant BS 4142 Clause	Commentary
Acoustic feature correction	+0dB	9.2 9.3.2	It is not anticipated that the specific sound will have any impulsive, tonal or intermittent characteristics. Recommendations provided for white noise reversing alarms are provided in Section 10.7.1.
Rating level	(47 + 0) dB = 47dB	9.2	
Background sound level	L _{A90} (30min) = 44dB	8	
Excess of rating over background sound level	(47 - 44) dB = 3dB	11	Assessment indicates that a <u>low impact</u> effect is likely on the noise sensitive locations as the specific sound is 3dB above the background levels and is lower than the residual sound. Context has also been considered insofar as the absolute level of predicted specific sound (i.e. 47 dB L _{Aeq,T}) is low (ref. EPA NG4 limits etc).
Uncertainty of the assessment	Not significant	10	The specific sound is a worst-case prediction as the assessment assumes a worst-case operational scenario. The assessed specific sound is the worst-case prediction to NSL1.

Based on the predicted noise levels at the most exposed noise sensitive receptors indicate that the Proposed Development will have a **low impact** considering the context of the development and the predicted noise levels.

10.6.2.3.2 Consideration of Tonality and Impulsivity

The assessment for tonality and impulsivity was conducted to evaluate noise emissions from the Proposed Development. Findings indicate that the noise emissions are lower than the residual noise levels in the area during the daytime period. Additionally, a review of third octave band noise levels at the closest noise sensitive receptor indicate that there will be no tonal aspects to the noise levels experienced at the closest NSL. Consequently, the emissions are unlikely to produce tonal or impulsive characteristics that will have an effect at the NSLs. The inclusion of white noise reverse alarms instead of the traditional single tone reverse alarm, which is a common noise complaint from developments similar to the Proposed Development, by eliminating the single tone reverse alarms and incorporating a broadband white noise reverse alarm will significantly reduce the potential for audible tonal frequency content at the sensitive receptors.

10.6.2.3.3 EPA NG4

NG4 recommends a daytime noise criterion of 55 dB $L_{A,T}$ (07:00–19:00 hrs) for assessing industrial and commercial noise. At NSL1, the predicted noise emissions from the Proposed Development during daytime hours are 47 dB $L_{Aeq,T}$, with no identified tonal or impulsive characteristics. As such, when applying a rating level in accordance with BS 4142:2014+A1:2019, no penalty is warranted. Therefore, the predicted noise levels at NSL1 are expected to remain below the NG4 criterion, and compliance with the guidance is anticipated. Table 10-16 outlines the predicted noise effect at each noise sensitive location, the project criteria and compliance with the project criteria.

Table 10-16 Operational Noise Levels at Each Sensitive Receptor

Noise Location	Sensitive	Distance to the Centre of the Site (m)	EPA Criteria	NG4 $L_{A,T}$ dBA	Daytime	Predicted Noise Level from the Proposed Development $L_{Aeq,T}$ dBA
NSL1 – Residential		205	55			47
NSL2 – Residential		285	55			45
NSL3 – Residential		355	55			40
NSL4 – Residential		700	55			35

10.6.2.4 Operational Phase – Vibration

There are no specific vibration criteria for buildings in Ireland. The vibration criteria for this project are based on BS 5228-2:2009+A1:2014, which provides guidance relating to the assessment of human response to vibration in terms of PPV. Table 10-17 outlines the range of vibration values and the associated potential effects on humans.

Table 10-17 Project Vibration Criteria

Vibration Level, PPV	Effect
0.14 mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies. At lower frequencies people are less sensitive to vibration.
0.3 mm/s	Vibration might be just perceptible in residential environments.
1 mm/s	It is likely that a vibration level of this magnitude in residential environments will cause complaint.

Vibrations typically become perceptible between 0.15 mm/s to 0.3 mm/s and may become annoying or disturbing at higher magnitudes. Higher levels of vibration are tolerated for single events or events of short duration, particularly during construction projects. For example, groundbreaking or piling can typically be tolerated at vibration levels up to 2.5 mm/s if adequate public relations are in place and timeframes are known.

10.6.3 Potential Cumulative Impacts

Application Reg Ref	Address	Development Proposal	Decision Date
LCC planning ref: 2560308	Kyletalesha & Kyleclonhobert, Portlaoise, County Laois, R32W978	The continued use of the site and premises from the 1 st of January 2026 as a waste transfer and processing facility, consistent with the extant permission Reg, Ref 15/403. An Environmental Impact Assessment Report (EIAR) has been prepared in respect of the proposed development.	24/10/2025 LCC: Conditional

An assessment of potential cumulative noise impacts was undertaken, considering the Proposed Development in conjunction with the existing facility operating under Ref: 2560308 located approximately 350m to the south of the Proposed Development. This facility operates under a Waste Licence (WO194-02) which mandates strict adherence to statutory noise emission limits at the nearest noise-sensitive receptors (NSLs).

The cumulative impact is screened out from further detailed assessment based on the following factors:

- **Regulatory Compliance:** The neighbouring facility is subject to periodic noise monitoring and ensure compliance with its license conditions. It is assumed that this facility operates within its permitted acoustic parameters.
- **Logarithmic Nature of Sound:** Given the separation distance between the two sites and the respective positions of the nearest NSLs, the noise contributions from each site are not expected to combine in a manner that creates a perceptible increase in ambient noise levels or leads to tonal or intermittent noise characteristics.

Conclusion: Due to the requirement for the neighbouring facility to comply with its existing Waste Licence and the spatial distribution of receptors, the cumulative noise impact of both developments during the operational phase will be neutral to slight and not significant.

10.6.4 “Do Nothing” Impact

Under the Do-Nothing scenario, the prevailing noise environment at the closest noise and vibration sensitive locations will remain in line with those measured during the baseline study and hence will be of neutral effect in terms of noise and vibration effect. Figures detailed in Section 10.6.2.2.1.2 aided by Chapter 13: Material Assets: Traffic and Transport, lend to the prevailing noise and vibration environment remaining the same as measured during the baseline survey period. Table 10-18 outlines the baseline from which the proposed developments traffic impacts have been determined, as outlined by Chapter 13: Material Assets: Traffic and Transport.

Table 10-18 Do-Nothing Scenario Forecast Traffic Volumes on L2117

Year	Total AADT	Of which, HGV	%HGV
2027	1,024	54	5%
2032	1,083	60	6%

Table 10-19 outlines the magnitude of change based on the increase in traffic flows from the Base Year to the Do-Nothing scenario. Traffic levels increasing less than 25% will likely equate to an increase of noise levels of less than 1dB(A).

Table 10-19 Magnitude of Change

Noise Change, dB	Magnitude of Impact
0	No Change
0.1 – 2.9	Negligible
3 – 4.9	Minor
5 – 9.9	Moderate
10+	Major

10.7 Avoidance, Remedial & Mitigation Measures

This section outlines remedial and mitigation measures based on the predicted noise and vibration effects of the construction and operational phases of the Proposed Development.

10.7.1 Construction Phase

10.7.1.1 Noise Mitigation Recommendations

Best practice measures for noise from construction sites are found within BS 5228 (2009+A1:2014) part 1. Construction noise effects are expected to vary during the construction phase of the Proposed Development; this effect will depend on the distance between the construction activities and noise sensitive receptors. The contractor will ensure that all best practice noise control measures will be used, to ensure any negative noise effects at noise sensitive locations are minimised.

The best practice measures set out in BS 5228 (2009) Part 1 includes guidance on several aspects of construction site mitigation measures, this includes the:

- Selection of quiet plant and equipment;
- Noise control at source of the noise;
- Screening; and
- Public liaison.

10.7.1.2 General Recommendations

This section sets out noise mitigation options and detailed comment on each one specifically for the Proposed Development.

10.7.1.2.1 Selection of Plant and Machinery

The noise effect of all plant and machinery shall be assessed prior to selection of the plant for the project. Where an item of plant is identified as noisy with the potential to cause a negative noise effect it shall be reviewed to check if there is an alternative quieter version of the same plant to undertake the same construction task.

10.7.1.2.2 Noise Control at Source

Where replacing a noisy item of plant is not viable or practical, consideration shall be given to control that noise at source. This includes modifying the piece of plant or machinery to generate less noise, using dampening to control vibration induced noise or rattling. Example best practice mitigation measures to be considered are as follows:

- All plant and equipment to be switched off when not in use to prevent idling;
- The use of white noise reversing alarms;
- Restriction on the dropping and loading of materials to less sensitive hours;
- Not dropping materials onto hard surfaces and using rubber mats etc for the dropping of materials; and
- Ensure all plant and equipment is well maintained and cleaned, all lubrication should be in line with manufacturers guidelines.

10.7.1.2.3 Public Engagement

A public liaison officer shall be put forward by the contractor to liaise with the local residents on matters relating to noise. Residents shall be informed of any noise works scheduled where there is the potential to generate high levels of construction noise or if specialist works etc need to be conducted out of the working hours. This person shall also be the point of contact for all complaints and be responsible for reviewing the noise monitoring results and exceedances.

10.7.1.2.4 Site Specific Recommendations

Table 10-20 outlines the recommended site-specific noise mitigation measures.

Table 10-20 Mitigation Measures Required During Construction Phase

Construction Stage	Recommended Noise Mitigation Measures
Site Setup	On this project 4 NSL's have been identified, it is recommended that a noise monitor is placed on the boundary of the nearest noise sensitive locations closest to the works i.e. NSL1.
Road Widening	Noise and vibration monitoring.

10.7.2 Operational Phase

10.7.3 Noise Mitigation Recommendations

The assessment conducted on the operational phase of the Proposed Development takes into account the operation of the infill plant machinery and the various heavy goods vehicles that will be delivering material for the infill process. The predicted results of the operational noise assessment predict that there will be no significant adverse noise effect on the surrounding

sensitive receptors, with the exception of reverse alarms which are traditionally single tone and high pitched in nature and can lead to tonal characteristics at the closest noise sensitive receptors, mitigation in the form of broadband white noise reverse alarms are recommended instead of the traditional single tone reverse alarms for use on the Proposed Development to control operational noise levels and reduce the potential for audible tonal frequency content effects at the closest noise sensitive locations.

10.7.4 Vibration Mitigation Recommendations

During the operational phase, potential sources of vibration will include the infilling process and the use of heavy plant, specifically excavators and bulldozers. While these activities have the potential to generate localized ground-borne vibration, the risk of perceptible vibration at the nearest sensitive receptors is considered low.

Given the separation distances between the infill areas and the site boundary, as well as the attenuating properties of the underlying peatland substrate, vibration levels are predicted to remain well below the thresholds for human perception or structural concern. Therefore, no specific mitigation measures are required to control vibration during the operational phase.

10.8 “Worst Case” Scenario

This assessment assumes a worst-case scenario when assessing the construction and operational noise and vibration effects on the surrounding noise sensitive locations. The dominating noise source in the area is road traffic noise, the additional construction traffic is not predicted to generate any additional noise effect. The operational traffic flows outlined in Section 10.6.2.2.1.2 are not predicted to cause an increase in traffic noise levels at the surrounding sensitive receptors. Additional operational noise sources such as infill plant machinery contribute to the operational noise emissions of the Proposed Development, as outlined in Section 10.6.2 the predicted noise emissions of the Proposed Development are within the project criteria.

10.9 Residual Effects

This section outlines the potential significant environment effects which remain after mitigation measures are implemented.

10.9.1 Construction Phase

10.9.1.1 Noise

As the construction phase is temporary, there will be no long-term/permanent noise effects on the surrounding area from construction noise. Section 10.7 outlines mitigation measures which if used in full will reduce the construction noise effect on the surrounding sensitive receptors and result in an overall effect that is considered non-significant in EIA terms.

10.9.1.2 Vibration

As the construction phase is temporary, there will be no long term/permanent vibration effects on the surrounding area from construction activities. Section 10.7 outlines mitigation measures which if used in full will reduce the construction vibration effect on the surrounding sensitive receptors and result in an overall effect that is considered non-significant in EIA terms.

10.9.2 Operational Phase

10.9.2.1 Noise

Operational noise sources include infill plant machinery and HGV deliveries of infill material. Based on the proposed noise sources in the development, the predicted operational noise levels will not cause significant adverse noise effects at the surrounding sensitive receptors and are therefore considered non-significant in EIA terms.

10.9.2.2 Vibration

During the operational phase, potential sources of vibration will include the infilling process and the use of heavy plant, specifically excavators and bulldozers. While these activities have the potential to generate localized ground-borne vibration, the risk of perceptible vibration at the nearest sensitive receptors is considered low.

Given the separation distances between the infill areas and the site boundary, as well as the attenuating properties of the underlying peatland substrate, vibration levels are predicted to remain well below the thresholds for human perception or structural concern. Therefore, no specific mitigation measures are required to control vibration during the operational phase.

10.9.3 Summary of Post-Mitigation Effects

Table 10-21 and

Table 10-22 summarise the identified likely significant residual effects during the construction phase of the Proposed Development following the application of mitigation measures.

Table 10-21 Summary of Construction Phase Effects Post Mitigation

Quality	Significance	Duration	Type
Neutral	Slight	Short-Term	Noise
Neutral	Imperceptible	Short-Term	Vibration

Table 10-22 Summary of Operational Phase Effects Post Mitigation

Quality	Significance	Duration	Type
Neutral	Slight	Short-Term	Noise
Neutral	Imperceptible	Short-Term	Vibration

10.10 Monitoring

This section outlines the recommended noise and vibration monitoring during the construction and operational phase of the Proposed Development.

10.10.1 Construction Phase

Noise and vibration monitoring will be implemented during the construction phase of the Proposed Development, particularly during the road widening works when significant road works will occur. Given the proximity of multiple NSLs to the site, monitoring equipment shall be installed at NSL 1 during the construction phase.

10.10.2 Operational Phase

Noise and vibration monitoring is not required during the operational phase of the Proposed Development as the predicted noise levels during the operational phase fall within project criteria, and there are no predicted sources of operational vibration proposed for the development.

In accordance with the Notification of Decision issued by the Planning Authority in 2024, the proposed infill activities on-site must adhere to the relevant waste management legislation.

“This Development is classified as a Landfilling/Waste Facility, reference the Councils adopted Development Contribution Scheme 2017 – 2023.”

Given the volume and nature of the material required for the infill site, the development may necessitate a Waste Management License or a Waste Facility Permit (depending on the final tonnage thresholds) as prescribed under the Waste Management (Facility Permit and Registration) Regulations 2007, as amended.

No infilling or waste deposition activities shall commence until the appropriate authorization has been secured from the Environmental Protection Agency (EPA) or the Local Authority. The appointed contractor will be responsible for ensuring that all imported material is classified as "by-product" or "waste" in accordance with the Waste Framework Directive, and that all site operations remain in strict compliance with the conditions set out in the grant of planning and the subsequent waste permit.

10.11 Interactions

This chapter has the potential to interact with the following environmental topics:

- Population and Human Health (Chapter 4); and
- Material Assets: Traffic and Transport (Chapter 13)

10.11.1 Population and Human Health

In this EIAR, the Noise and Vibration chapter has been developed in close coordination with the Population and Human Health chapter to assess the potential effects of noise on NSLs. The location of NSLs informed the selection of assessment locations for noise modelling. Predicted noise levels from both the construction and operational phases have been evaluated in terms of their potential effects on human health, including annoyance and disturbance. The integrated approach ensures that the assessment considers, not only technical compliance with noise limits, but also the broader implications for community wellbeing.

10.11.2 Material Assets: Traffic and Transport

This chapter incorporates data from the traffic consultants to assess the potential noise effects from both construction and operational traffic associated with the Proposed Development. Annual Average Daily Traffic (AADT), vehicle speed and vehicle types (including HGVs) have been considered to calculate the additional noise generated by the Proposed Development, relative to the baseline conditions. Based on the predicted increase in traffic volumes, a predicted increase of less than 1dB during the operational phase of the Proposed

Development, this increase is considered negligible, as the lowest decibel change the human ear can discern is 3dB making this increase negligible in terms of magnitude of change.

10.12 Difficulties Encountered When Compiling

There were no difficulties in compiling this chapter.

10.13 Conclusion

This chapter provides a comprehensive assessment of the potential noise and vibration effects associated with the Proposed Development. It examines both the construction and operational phases, analyses the impacts on surrounding noise sensitive receptors and outlines the necessary mitigation measures to ensure that the project complies with all relevant noise and vibration criteria. The methodology is based on established best-practice guidance from sources such as BS 5228, BS 4142 and the EPA's NG4.

10.13.1 Construction Phase

The construction phase is expected to have a temporary effect on surrounding Noise Sensitive Locations (NSLs). Without mitigation, the predicted noise levels from on-site activities, such as site set-up and road widening, are predicted to remain within the project criteria of 65 dB $L_{Aeq,T}$ at all NSLs. The assessment of construction traffic noise concludes that the projected increase in vehicle numbers is negligible and will not cause a perceptible or significant increase in noise levels.

The potential for unmitigated construction vibration is also assessed. While vibration is not anticipated to be a major concern for the majority of the construction period, it is a possibility during the infill process with the operation of heavy plant and machinery such as bulldozers, excavators and any soil compaction activities. The effect is determined to be slight in significance, which, according to the binary judgment framework, means it is not significant. This is a temporary effect that is likely to occur.

10.13.2 Operational Phase

The assessment of operational noise sources associated with the infill site, including heavy goods vehicle (HGV) movements, material handling/compaction, and on-site plant machinery, concludes that the overall effect on the external sensitive receptors will be not significant. The quality of the effect is characterised as neutral and the significance is considered slight, with a likely and temporary occurrence during the operational lifespan of the facility proposed as 5 years.

Noise generated by site activities has been assessed as imperceptible to slight at the nearest noise sensitive locations, as these sounds are consistent with the existing local acoustic climate (e.g., road traffic and agricultural activity). It is recommended that broadband white noise alarms are used in lieu of traditional tonal reverse alarms.

During the operational phase, potential sources of vibration will include the infilling process and the use of heavy plant, specifically excavators and bulldozers. While these activities have the potential to generate localized ground-borne vibration, the risk of perceptible vibration at the nearest sensitive receptors is considered low.

Given the separation distances between the infill areas and the site boundary, as well as the attenuating properties of the underlying peatland substrate, vibration levels are predicted to remain well below the thresholds for human perception or structural concern. Therefore, no specific mitigation measures are required to control vibration during the operational phase.

10.13.3 Overall Conclusion

The noise and vibration assessment concludes that the proposed development's unmitigated construction activities will not have a significant adverse effect on surrounding sensitive receptors.

During the operational phase, the development is not expected to cause any adverse noise or vibration effects on external receptors.

The final residual effect of the proposed development will be not significant with the successful implementation of all mitigation and design measures.

10.14 References

Design Manual for Roads and Bridges Volume 11 Section 3 Part 7 (HD 213/11 – Revision 1) (The Highways Agency et al., 2011).

BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise.

BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Vibration.

BS 7385: 1993: Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration.

ISO 1996-1:2016 Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment procedures.

ISO 1996-2:2017 Acoustics - Description, measurement and assessment of environmental noise Part 2: Determination of sound pressure levels.

ISO 9613-1:1993 Acoustics - Attenuation of sound during propagation outdoors -- Part 1: Calculation of the absorption of sound by the atmosphere.

ISO 9613-2:1996 Acoustics - Attenuation of sound during propagation outdoors -- Part 2: General method of calculation.

British Standard BS 6472-1:2008 Guide to evaluation of human exposure to vibration in buildings.

Environmental Protection Agency (2016) Guidance Note for Noise (NG4): Licence Applications, Surveys and Assessments in Relation to Scheduled Activities.

BS 4142:2014+A1:2019: Methods for rating and assessing industrial and commercial sound.

Guidelines for the Treatment of Noise & Vibration in National Road Schemes, National Roads Authority, Revision 1, 25th October 2004.

Laois Council Noise Action Plan 2024-2028.

NRA Traffic Grid Flow Pattern.

Calculation of Road Traffic Noise (CoRTN): 1998.

11 LANDSCAPE AND VISUAL ASSESSMENT

11.1 Introduction

This chapter assesses the effects of the Proposed Development on the landscape and visual amenities of the area and details the potential direct and indirect effects of the Proposed Development on landscape fabric, character and quality, and the resulting impact on visual amenity.

The purpose of this assessment is to evaluate the existing landscape character of the site and surroundings, to assess the visual impact of the Proposed Development and to identify landscape designations and planning policies that may concern the site and its environs.

The Landscape Impact Assessment (LIA) relates to assessing effects on the landscape as a resource in its own right and is concerned with how the Proposed Development will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character. The Visual Impact Assessment (VIA) relates to assessing effects on specific views and on the general visual amenity experienced by people. This deals with how the surroundings of individuals or groups of people may be specifically affected by changes in the content and character of views as a result of the change or loss of existing elements of the landscape and/or the introduction of new elements. Visual effects may occur from visual obstruction (blocking of a view, be it full, partial or intermittent) or visual intrusion (interruption of a view without blocking).

Cumulative landscape and visual impact assessment is concerned with additional changes to the landscape or visual amenity caused by the Proposed Development in conjunction with other developments, or actions that occurred in the past, present or are likely to occur in the foreseeable future

11.1.1. Quality Assurance and Competency of Experts

This chapter has been prepared by landscape architect Dara Hilliard. Dara has a BSc Agric. Landscape Horticulture and is a Member of the Irish Landscape Institute (ILI) and Senior Landscape Architect at DNV. Dara has over 15 years' experience in producing Landscaping and Visual Impact Assessments for developments and over 25 years' experience in the landscape design, management and specification.

This chapter has been approved by Catherine Keogan, Technical Director and EIA Lead at DNV. Catherine is an environmental consultant with over 20 years' experience in consultancy, specialising in EIAs for a range of developments, working closely with a range of developers, planning consultants and architects within the public and private sector.

11.2 Study Methodology

This section sets out the methodology for the Landscape and Visual Assessment (LVA) as a result of the Proposed Development.

11.2.1. Guidelines and other information used in the LVIA

The assessment has been undertaken in accordance with best practice, legislation and guidance notes. The methodology used is based on the Environmental Protection Agency *Environmental Protection Agency (EPA) Guidelines on the Information to be contained in Environmental Impact Assessment Report (2022)* and subsequent Advice Notes, and their precursor *The Guidelines on the Information to be contained in Environmental Impact Statements (2002)* and *Advice notes on current practise in the preparation of Environmental Impact Statements (2003)*. It is also based on the Department of the Environment, Heritage and Local Government's Document; *Architectural Heritage Protection, Guidelines for Planning Authorities, 2004* and the Landscape Institute and Institute of Environmental Management & Assessment Document *Guidelines for Landscape and Visual Impact Assessment (2013)*.

The aforementioned documents recommend baseline studies to describe, classify and appraise the existing landscape and visual properties, focusing on any sensitive receptors in the area and the ability of the landscape to accommodate the Proposed Development changes that will occur at the Site. This is established through a collective process of desktop study and onsite survey work. Once the baseline conditions are established it allows for the identification of impacts, and an assessment of their magnitude and significance on the landscape character and visual amenities of the area.

A judgement on the sensitivity of the landscape is made from a combination of the susceptibility of the landscape to development, and therefore change, and the value attached to that landscape. This is determined by way of existing designations, both legislative and non-legislative for scenic beauty, landscape quality, recreational value, significant importance, and rarity. Visual sensitivity is determined by a combination of judgements about the susceptibility of visual receptors such as dwellings, roads, scenic spots etc. to changes in visual amenity and the value attached to these views. The *Guidelines for Landscape and Visual Impact Assessment* state that the aim is "to establish the area in which the development will be visible, the different groups of people who may experience views of the development, the places where they will be affected and the nature of the views and visual amenity at those points".

11.2.2. Terminology

Landscape impacts are defined as changes in the fabric, character and quality of the landscape as a result of the development. This includes direct effects on landscape receptors and indirect effects that can alter the wider distinctiveness of the landscape. Landscape receptors are the physical or natural resource that will experience an impact. The sensitivity of a landscape receptor is its vulnerability to change.

The extents of landscape effects are assessed by first establishing the baseline conditions by classifying baseline data according to its importance and sensitivity. Secondly, evaluation of the landscape impact on the baseline environment using the terminology defined in Tables 11-1 to 11-4.

For the purposes of this study, the term 'landscape' as applied throughout should be read as being inclusive of the urban fabric of the city and the built environment, or 'townscape'.

Visual impacts relate solely to changes in available views of the landscape and the effects of those changes on people, viewer group or special interest groups. They include the direct impact of the development on views, the potential reaction of viewers, their location and

number and the impact on visual amenity. The intensity of the visual impacts on the baseline visual environment is assessed by using the terminology defined in Tables 11-1, to 11-4.

Table 11-1 The extent of Landscape Impact (based on ratings from the EPA Guidelines, 2022)

Extent	Description
Level 1 Imperceptible Effects	An effect capable of measurement but without noticeable consequences. There are no noticeable changes to landscape context, character or features.
Level 2 Not significant	An effect which causes noticeable changes in the character of the landscape but without noticeable consequences. There are no appreciable changes to landscape context, character or features.
Level 3 Slight Effects	An effect which causes noticeable changes in the character of the landscape without affecting its sensitivities. There are minor changes over a small proportion of the area or moderate changes in a localised area or changes that are reparable over time.
Level 4 Moderate Effects	An effect that alters the character of the landscape in a manner that is consistent with existing and emerging trends. There are minor changes over some of the area (up to 30%) or moderate changes in a localised area.
Level 5 Significant Effects	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the landscape. There are notable changes in landscape characteristics over a substantial area (30-50%) or an intensive change over a more limited area
Level 6 Very Significant Effects	An effect which, by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the environment. There are notable changes in landscape characteristics over a substantial area (50-70%) or a very intensive change over a more limited area
Level 7 Profound Effects	An effect which obliterates sensitive characteristics. There are notable changes in landscape characteristics over an extensive area (70-100%) or a very intensive change over a more limited area

Visual impacts relate solely to changes in available views of the landscape and the effects of those changes on people, viewer group or special interest groups. They include the direct impact of the development on views, the potential reaction of viewers, their location and number and the impact on visual amenity. The intensity of the visual impacts on the baseline visual environment is assessed by using the terminology defined in Tables 11 -2, to 11-4.

Table 11-2 The extent of Visual Impact (based on ratings from the EPA Guidelines, 2022)

Extent	Description
Level 1 Imperceptible Effects	There are no noticeable changes to views in the visual landscape.
Level 2 Not significant	An effect which causes noticeable changes in the character of the visual environment but without noticeable consequences. The proposal is adequately screened due to the existing landform, vegetation or constructed features.
Level 3 Slight Effects	An effect which causes noticeable changes in the character of the visual environment without affecting its sensitivities. The affected view forms only a small element in the overall visual composition, or changes the view in a marginal manner.
Level 4 Moderate Effects	An effect that alters the character of the visual environment in a manner that is consistent with existing and emerging trends. The proposal affects an appreciable segment of the overall visual composition, or there is an intrusion in the foreground of a view.
Level 5 Significant Effects	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the visual environment. The proposal affects a large proportion of the overall visual composition, or views are so affected that they form a new element in the physical landscape.
Level 6 Very Significant Effects	An effect which, by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the visual environment. The proposal affects the majority of the overall visual composition, or views are so affected that they form a new element in the physical landscape.
Level 7 Profound Effects	An effect which obliterates sensitive characteristics. The view is entirely altered, obscured or affected.

Table 11-3 Quality of the Landscape and Visual Impact (EPA Guidelines 2022)

Extent	Description
Neutral Effect	Neither detracts from nor enhances the landscape of the receiving environment or view
Positive Effect	Improves or enhances the landscape of the receiving environment or a particular view
Negative Effect	Detracts from the quality of the landscape or view

Table 11-4 The Duration of Landscape and Visual Impact (EPA Guidelines 2022)

Extent	Description
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting one year or less
Short-term	Effects lasting one to seven years
Medium-term	Effects lasting seven to fifteen years
Long-term	Effects lasting fifteen to sixty years
Permanent Effects	Effects lasting over sixty years.
Reversible Effects	Effects that can be undone, for example through remediation or restoration.

Please note: “Momentary” and “Brief” Effects as defined in the EPA Guidelines (2022) are not considered relevant to landscape & visual assessment as effects of such short duration are extremely unlikely to generate appreciable effects.

The landscape and visual assessment methodology will be utilised in conjunction with a professional evaluation of the Proposed Development to determine the degree of impact.

11.2.3. Study Area

The term ‘study area’ as used in this chapter refers to the site itself (i.e. the extent of the planning application) and its wider landscape context in the study of the context, physical landscape and landscape character. This may extend for approximately 1-5km or more in all directions from the site in order to achieve an understanding of the overall landscape.

As one moves away from any type of development in the landscape, it will become less perceptible with distance. It is common practice to consider the viewpoint distance as laid out in Table 11–5 below.

Table 11-5 Distance and views

Viewpoint Distance	Description
0-2km	It is generally accepted that a development located approximately 2km or less from a viewer would be close enough to allow identification of significant detail. Any positions within this range with open uninterrupted views of a development would generally receive the greatest visual impacts.
2-5km	At this distance, visibility of a development site becomes more general, with viewers in open uninterrupted positions able to identify general form, colour/tone and textural contrast, but losing the more focused detail achievable from closer positions. Impacts at this distance are generally less than those found between 0-2km.
5-10km	Beyond 5km visual prominence quickly diminishes. Certain circumstances/light conditions etc. have potential to allow certain types of development and material finishes to be perceived. The development increasingly becomes part of the general background/distance views. Upwards of 15km distance, developments quickly become minor features within the landscape and considered imperceptible to the average human eye. The impact of the development diminishes as the developments becomes part of the general background/distance views.

In terms of the visual assessment, the study of visual amenity may extend outside the site area, from areas where views of the site are available, but the majority of visual impacts for a development of this nature would be most likely within the local context (c.1km) as:

- the area is not densely populated;
- the relatively low road density;
- the terrain is relatively flat in the immediate surrounds with well-developed vegetative field boundaries;
- the proposal involves using machinery like what is used in intensive agriculture/forestry operations;
- ground level changes are below the existing road network; and
- the reasonably well-developed hedgerows surrounding it and their presence in the adjoining landscape.

To ensure clarity and transparency in the assessment of visual effects, a receptor inventory was prepared to identify the principal groups of viewers who may experience views of the Proposed Development. Receptors were classified according to their location, typical viewing direction, distance from the Site, and their sensitivity in accordance with GLVIA3 principles. Visibility was verified through a combination of field survey and desktop analysis of landform, hedgerows, and built features. The table below (Table 11-1) summarises the receptor groups considered relevant to the Landscape and Visual Impact Assessment.

Table 11-1 Receptor Inventory Table

Receptor Type	Location / Direction	Distance	Sensitivity	Visibility	Notes
Local Road Users (L2117)	Along eastern boundary	0–50 m	Medium–Low	Partial / Glimpsed	Brief views; hedgerows limit visibility.
Nearby Dwellings	East and south	100–600 m	Medium	None / Screened	Views blocked by vegetation & landform.
Agricultural Workers	Adjacent fields	50–200 m	Low	Glimpsed / Screened	Receptors not focused on views.
Users of Minor Roads	S / E	200–800 m	Medium–Low	None / Intermittent	Hedgerows block sustained views.
Commercial Premises	400m south west	400 m	Low	None	Buildings and distance screen views.
Recreational Users	Local road network	0–500 m	Medium–Low	Partial	Similar to road users; no designated routes.
Rail / National Routes	—	—	—	None	Outside ZTV.

The ZTV analysis (Figure 11-2) illustrates the theoretical extent of visibility of a 2m high object located on the eastern boundary of the Proposed Development. The ZTV indicates that potential visibility is largely confined to the immediate vicinity of the site, with limited areas to the north, south and west, may occur. These areas are further screened by intervening hedgerows, local topography, and existing vegetation, which significantly reduce actual

visibility on the ground. Although the ZTV modelling used a 2m reference height, this is a precautionary height for assessing visibility of activities rather than the eventual landform. The proposed 2.6m maximum fill height occurs within the interior of the Site and remains below local road levels. Moreover, machinery present during operation is comparable in height to agricultural machinery already used throughout the local landscape and is therefore not visually anomalous. Additional ZTV runs using increased height were tested for internal methodological robustness and not intended to form part of the formal assessment and produced no material change in the visibility envelope.

Given the limited ZTV extent, absence of elevated viewpoints, and the high degree of existing and proposed screening, the inclusion of photomontages would not materially improve the understanding of visual effects. Photomontages tend to be most informative for developments with vertical structures, long-distance visibility, or prominent skylining—none of which apply to this low-lying, screened landform. Field verification notes were logged during site visits and confirm the absence of representative viewpoints beyond the road corridor.

On this basis, photomontages would not add value to the assessment and are not considered proportionate or necessary. The combination of the proposal particulars, natural screening, site design, and mitigation measures ensures that the Proposed Development will not result in notable visual intrusion beyond the local context.

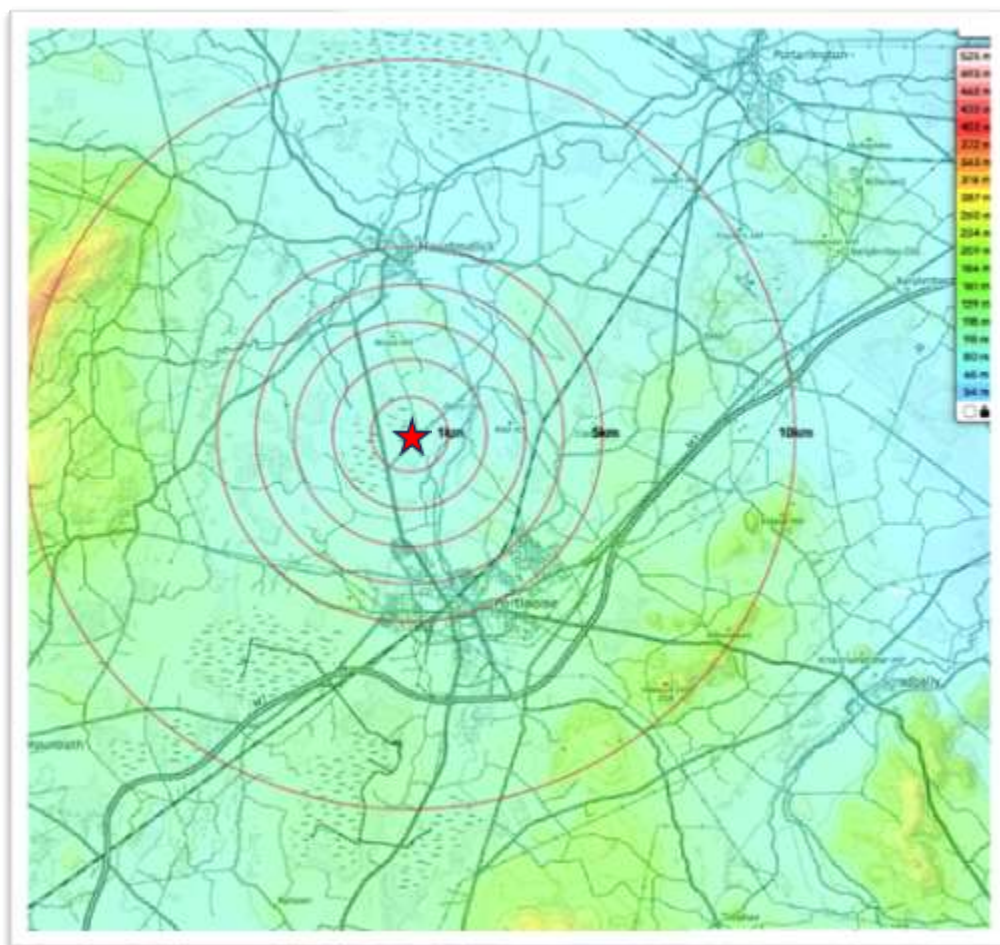
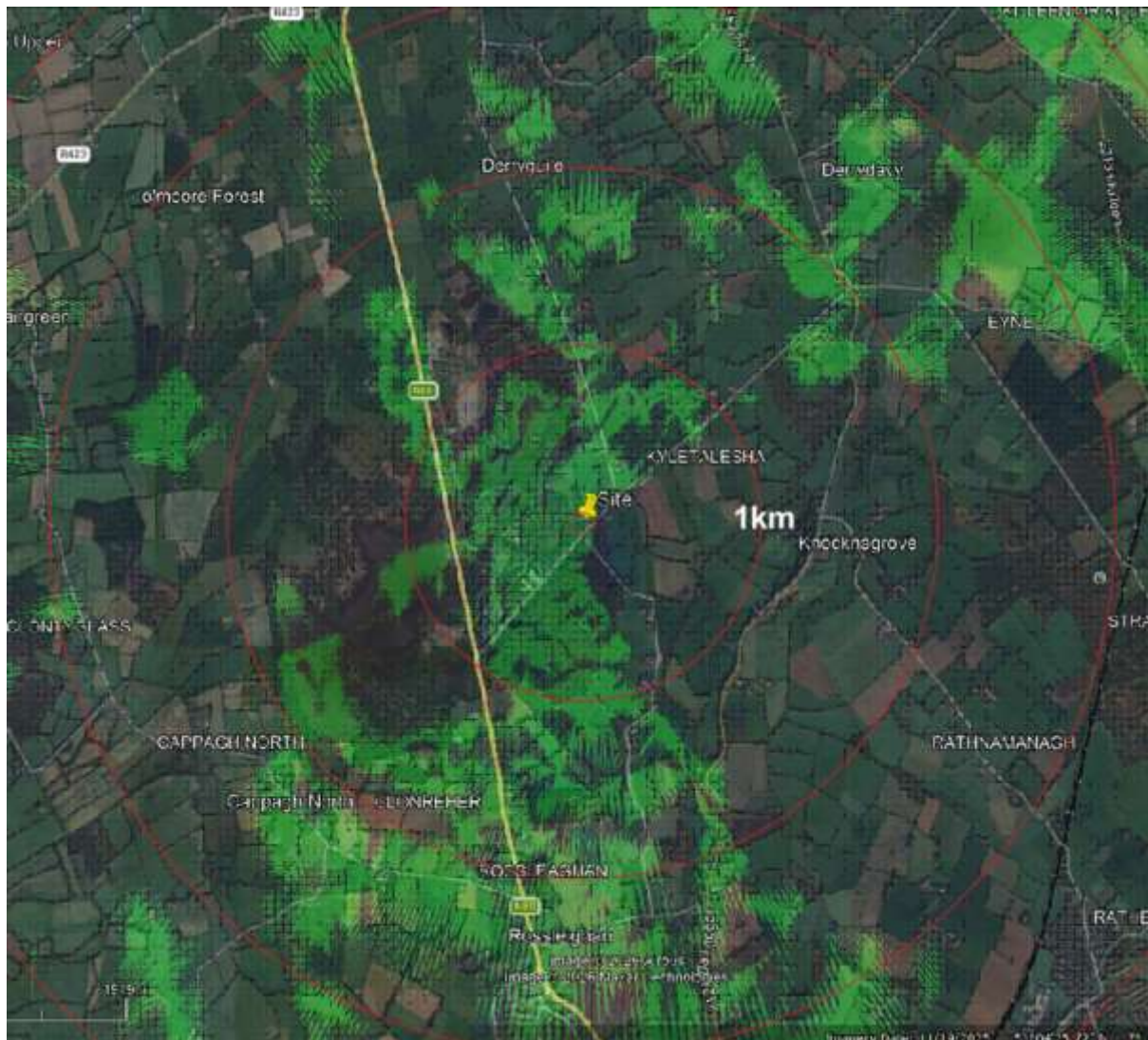


Figure 11-1 Site location red star, and 1km offsets and surrounding topography.



11.2.4. Assessment Criteria

There are four key aspects of any impact;

1. its quality/character
2. its significance/magnitude or intensity
3. its duration
4. its consequence (who will be affected and their sensitivity, can it be avoided mitigated or remedied)

Tables 11-6 to 11-11 outline the criteria and terminology used to make the landscape and visual impact evaluations in this report.

Table 11-6 Landscape Sensitivity Criteria

Class	Criteria
High	Landscape characteristics or features with little or no capacity to absorb change without fundamentally altering their present character. Landscape designated for its international or national landscape value. Outstanding example in the area of well cared for landscape or set of features
High-Medium	Landscape characteristics or features with a low capacity to absorb change without fundamentally altering their present character. Landscape designated for regional or county-wide landscape value where the characteristics or qualities that provided the basis for their designation are apparent. Good example in the area of reasonably well cared for landscape with notable landscape features.
Medium	Landscape characteristics or features with moderate capacity to absorb change without fundamentally altering their present character. Landscape designated for its local landscape value or a regional designated landscape where the characteristics and qualities that led to the designation of the area are less apparent or are partially eroded or an undesignated landscape which may be valued locally – for example an important open space. An example of a landscape or a set of features which is neutral or mixed character.
Medium - Low	Landscape characteristics or features which are reasonably tolerant of change without detriment to their present character. No landscape designation present or of medium to low local value, or an example of a common or un-stimulating landscape or set of features and conditions.
Low	Landscape characteristics or features which are tolerant of change without detriment to their present character. No designation present or of low local value. An example of monotonous unattractive visually conflicting or degraded landscape or set of features.

Table 11-7 Visual Sensitivity Criteria

Class	Criteria
High	Users of outdoor recreational facilities, on recognised national cycling or walking routes or in national designated landscapes. Dwellings with views orientated towards the proposed development.
High - Medium	Users of outdoor recreational facilities, in locally designated landscapes or on local recreational routes that are well publicised in guide books. Road and rail users in nationally designated landscapes or on recognised scenic routes, likely to be travelling to enjoy the view.
Medium	Users of primary transport road network, orientated towards the Development, likely to be travelling for other purposes than just the view. Dwellings with oblique views of the proposed development.
Medium - Low	People engaged in active outdoor sports or recreation and less likely to focus on the view. Outdoor workers – agriculture, horticulture

	Primary transport road network and rail users likely to be travelling to work with oblique views of the Development or users of minor road network.
Low	People engaged in work activities indoors, with limited opportunity for views of the Development.

Table 11-8 Landscape Magnitude Criteria

Class	Criteria
Very High	Very extensive, highly noticeable change, affecting most key characteristics and dominating the experience of the landscape; and, Introduction of highly incongruous development.
High	Extensive, noticeable change, affecting many key characteristics and the experience of the landscape; and, Introduction of many incongruous elements.
Medium	Noticeable change to a significant proportion of the landscape, affecting some key characteristics and the experience of the landscape; and Introduction of some uncharacteristic elements.
Low	Minor change, affecting some characteristics and the experience of the landscape to an extent; and, Introduction of elements that are not uncharacteristic.
Very Low	Little perceptible change.

Table 11-9 Visual Magnitude Criteria

Class	Criteria
Very High	The development would dominate the existing view.
High	The development would cause a considerable change to the existing view over a wide area or an intensive change over a limited area.
Medium	The development would cause moderate changes to the existing view over a wide area or noticeable change over a limited area.
Low	The development would cause minor changes to the existing view over a wide area or moderate changes over a limited area.
Very Low	No real change to perception of the view. Weak, not legible, and/ or indiscernible.

Table 11-10 Categories of Landscape and Visual Significance of Impact

Degree of significance	Description of Landscape	Impact Description of Visual Impact
Major	Substantial alteration to elements /features of the baseline (pre-development) conditions. Notably affect an area of recognised national landscape quality. Substantial alteration to the character, scale or pattern of the landscape.	Major/substantial alteration to elements/features of the baseline(pre-development) conditions. Where the proposed development would cause a very noticeable alteration in the existing view. This would typically occur where the proposed development closes an existing view of a landscape of regional or national importance and the proposed development would dominate the future view.
Moderate-Major	This category is a combination of descriptions of Major listed above and Moderate below. These combinations are discussed within the assessment of each landscape or visual receptor when they occur.	
Moderate	Alteration to elements/features of the baseline conditions. Affects an area of recognised regional landscape quality. Alteration to the character, scale or pattern of the local landscape.	Alteration to one or more elements/features of the baseline conditions such that post development character/attributes of the baseline will be materially changed. This would typically occur where the proposed development closes an existing view of a local landscape and the proposed development would be prominent in the future view.
Moderate-Minor	This category is a combination of descriptions of Moderate listed above and Minor below. These combinations are discussed within the assessment of each landscape or visual receptor when they occur.	
Minor	A minor shift away from baseline conditions. The Development partially changes the character of the site without compromising the overall existing landscape character area.	A minor shift away from baseline conditions. This occurs where change arising from the alteration would be discernible but the underlying character / composition / attributes of the baseline condition will be similar to the pre-development. It would also occur where the proposed development newly appears in the view but not as a point of principal focus or where the proposed development is closely located to the viewpoint but seen at an acute angle and at the extremity of the overall view.
Negligible	No or very little change from baseline conditions. Change not material, barely distinguishable or indistinguishable	Where there is no discernible improvement or deterioration in the existing view.
No Impact	The Development would not affect the landscape receptor.	The Development would not affect the view

The significance of identified landscape and visual impacts is established through a simple matrix, which measures the magnitude of change against landscape or visual sensitivity. The resulting impacts are classed Major, Moderate-Major, Moderate, Minor, Negligible/None.

Therefore, as the sensitivity of a landscape increases from Low to High, and the Magnitude of Change increases from Very Low to Very High the predicted impacts also increase.

The example matrix table below is used to summarise the findings from the criteria tables. By combining sensitively (along the top) with predicted magnitude of change (along the side) a

predicted impact/ effect is reached. This format is applicable to both landscape impacts and visual impacts.

The significance ratings have been assigned in strict accordance with EPA Guidelines (2022) and GLVIA3 methodology. The low sensitivity and low magnitude ratings are a direct reflection of field-verified site characteristics, including the degree of enclosure, low receptor density, absence of scenic designations, and the working agricultural and commercial context. No assumptions or professional value judgements were used to artificially reduce or inflate impact ratings; assessments follow quantitative and qualitative criteria set out in national guidance.

Table 11-11 Level of Impact resulting from combination of Sensitivity Rating & Magnitude of Change

	Magnitude of Change				
Sensitivity	Very High	High	Medium	Low	No appreciable change
Very High (IV)	Profound	Very Significant	Significant	Moderate	Slight
High (III)	Very Significant	Significant	Significant	Moderate	Slight
Medium (II)	Significant	Significant	Moderate	Slight	Not Significant
Low (I)	Moderate	Moderate	Slight	Not Significant	Imperceptible
No sensitivity	Slight	Slight	Not Significant	Imperceptible	Imperceptible

11.2.5. Assessing Cumulative Landscape and Visual Effects

Current guidelines suggest that a determination should be made as to whether cumulative effects are likely to occur – these are outlined in the current GLVIA guidelines (3rd edition) as ‘the additional changes caused by the proposed development in conjunction with other similar developments or as the combined effect of a set of developments, taken together’. Such determination needs to be made in respect of any permitted development of a similar nature which will have a bearing on the assessment of the proposed development.

The purpose of assessing cumulative landscape and visual effects is to provide a comprehensive understanding of potential cumulative impacts and to inform decision-making processes, ensuring that the cumulative implications of multiple projects are considered and managed appropriately.

11.3 The Existing and Receiving Environment (Baseline Situation)

11.3.1. Landscape appearance and character

The site itself has numerous stands of probable self-seeded trees and shrubs with a long agriculturally ungrazed sward present (see Fig 11-3) typical of cutaway peat/bogland. Typical species include willow, birch and scot's pine, along with gorse, briar and some hawthorn along the dryer road side boundaries.

While the Site contains areas of regenerating scrub and cutover bog, these features are characteristic of lands undergoing natural succession following historic peat extraction. Historic aerial imagery confirms the landscape is already significantly modified from its original ecological and landscape condition. As such, its sensitivity to further change is demonstrably lower than intact peatland, estate landscapes, or designated scenic areas. The existing vegetation is patchy, largely self-seeded, and of variable structure, offering limited long-term landscape screening of the site without intervention.



Figure 11-3 photos of typical on site vegetation and character

The eastern boundary of the site is defined by the local road, L2117, and a hardcore lane to lands behind the site. A gappy hedgeline of hawthorn, hazel and briar and some larger trees are present along the roadside edge (see Fig 11-4)

The surrounding landscape and character is defined by land use with agricultural grazing and commercial non native forestry dominating along with a landfill site, commercial warehousing, farm buildings and one off houses (see Fig 11-5,6).



Figure 11-4 View site's roadside boundary from the opposite side of the L2117, looking south west direction.



Figure 11-5 View across agricultural grassland field to north east with one off houses



Figure 11-6 View of commercial premises c.400m south of site

11.3.2. Planning designation and zoning

In the Laois County Council County Development Plan 2021-2027, the site is located in the Landscape Character Area Lowland Agricultural Area.

The policy objectives for Lowland Agricultural Areas are;

- **LCA 13** Recognise that this lowland landscape character area includes areas of significant landscape and ecological value, which are worthy of protection, particularly the 18th and 19th century estate landscapes and associated parkland & woodland to develop them as a tourism resource.
- **LCA 14** Continue to permit development that can utilise existing structures, settlement areas and infrastructure, whilst taking account of the visual absorption opportunities provided by existing topography and vegetation
- **LCA 15** Recognise that the lowlands are made up of a variety of working landscapes, which are critical resources for sustaining the economic and social wellbeing of the county
- **LCA 16** Promote good agricultural practices to create a sustainable rural economy and support incentives for smaller rural/family farms to manage their land to avoid loss of hedgerows and field patterns.

The Proposed Development directly aligns with:

- LCA 13 as it does not fall within any estate landscape or parkland referenced under LCA 13
- LCA 14 by utilising existing access routes, vegetation, and topographic containment to absorb visual effects.

- In line with LCA 15, the development supports local economic activity and land restoration without altering the fundamental working landscape character of the Lowland Agricultural Area.
- It does not conflict with LCA 16, as hedgerow enhancement is a core mitigation component and the proposal results in a net increase in native, structurally diverse planting.

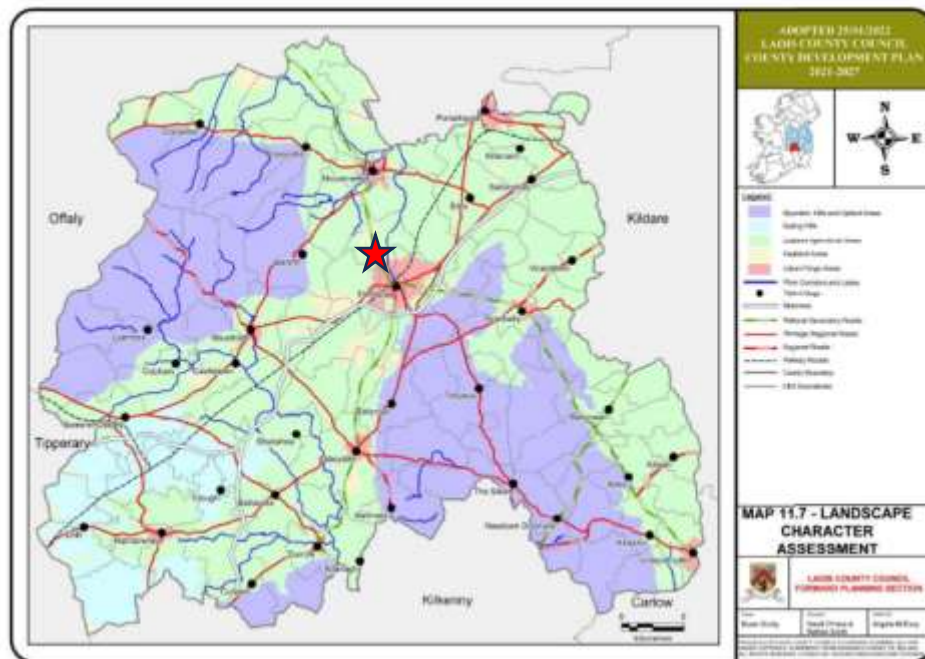


Figure 11-7 Landscape Character Assessment and (site red star)

11.3.3. Views and Prospects

There are no views or prospects that look onto or towards the site.

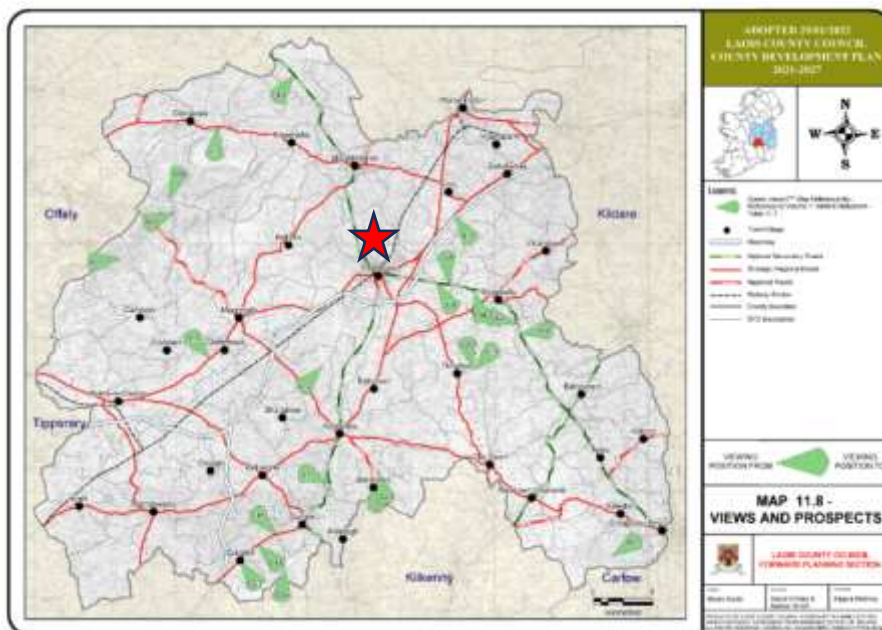


Figure 11-8 Site location (red star) and Views and prospects

11.4 Characteristics of the Proposed Development

The Proposed Development comprises of permission for a land filling (max 2.6m) and recontouring development on 2.92 hectares (7.2 acres) of partially wooded cutover bog. The purpose is to recover and recycle surplus excavated soil from nearby development sites and restore the land for future agricultural/amenity/forestry potential. The material will originate from local greenfield residential development sites, all within approx. 5 km.

Firstly, the site will be cleared of scrub and vegetation internally. Any tree or shrub vegetation that lies directly along the southern, western or northern boundaries will be retained. These boundaries will be further reinforced with a c.5m wide dense native planting along the proposed side slopes of the filled material.

In addition, the installation of a temporary construction compound, site office, parking, and welfare facilities along with temporary drainage and sediment controls (silt fences, swales, silt traps). Importation and placement of inert soil using HGVs and plant. The machinery employed will be typical in scale and nature to that commonly seen in modern intensive agricultural and forestry operations.

11.4.1. Construction Phase

The construction phase (site clearance and preparation and fencing) is expected to last 5 days to initial site establishment. Along the eastern boundary the removal of c. 25 multi stemmed hawthorn will be needed to facilitate sightlines. The removal of c.25 multi stemmed hawthorn plants along the eastern boundary is limited in extent and is required solely to achieve safe sightlines in accordance with national road design guidance. A boundary vegetation survey undertaken on site confirmed that this vegetation is not part of a continuous mature hedgerow but comprises irregular, gappy, largely self-seeded growth of modest landscape value. The proposed replacement planting uses semi-mature specimens and a 5m-wide native buffer, which will exceed the screening capacity of the existing vegetation within a short (less than 7 years) establishment period. Therefore, any temporary reduction in screening is offset by the long-term improvement in landscape structure and visual absorption capacity.

A 2.1m high palisade is proposed behind the sightlines and along the eastern boundary. A temporary construction compound will be built. Planting works along fence lines is to happen the first planting season (November to March) after the site construction phase. During the construction phase, machinery similar in scale and size to agricultural equipment will operate across the site. There will be a noticeable change in landform and colour as excavation and soil storage occur but this would be similar to that experienced in other modern intensive agricultural works.

11.4.2. Operational Phase

In the operational phase, machinery typical in scale and nature to that commonly seen in modern intensive agricultural and forestry operations will be operating on site. The portion of the site nearest the road side will be filled first. Visibility of machinery will be most prominent at this stage but will reduce dramatically with time as the filling of the site will progress away from the eastern boundary to the western boundary. The proposed native planting will also quickly screen the site.

11.5 Potential Effect of the Proposed Development

11.5.1. Construction Phase

The construction stage is expected to last approximately 5 days. Anticipated landscape and visual impacts include:

- Presence of large, brightly coloured earth-moving and construction machinery operating on-site.
- Alteration of landform and colour due to infilling, soil disturbance.
- Loss of existing scrub growth across the site except along site boundaries where all bar 25 multistemmed hawthorn are expected to be removed.

Visual impacts during construction will mirror landscape impacts. Due to surrounding field hedgerows and local topography, visual effects will diminish rapidly with distance as intervening vegetation and topography will screens views.

While vegetation clearance and compound installation occur at the outset, the period during which the site appears visually disturbed is brief due to the low level of existing public visibility. Furthermore, the majority of activity occurs away from the roadside boundary. By front-loading boundary planting and carrying out reinstatement in parallel with site preparation, visual disruption is minimised to an extremely short duration relative to the lifespan of the operational phase.

In addition, it is worth mentioning that developments that at first might be regarded by the public as notable can be expected overtime to gradually diminish and will be perceived as part of the background with time.

Overall, construction-phase impacts are considered negative to neutral in quality, low in magnitude, minor in significance, and temporary (lasting 1 year or less) in nature.

11.5.2. Operational Phase

During the operational phase (5 years), the visual and landscape impacts will be less than those experienced during the construction phase for the following reasons:

- Reduced Visibility of Machinery: there will be a greater distance between machinery and potential receptors as operations move back away from the L2117.
- Established native planting: Perimeter vegetation will establish quickly and provide effective visual screening.
- Lower activity levels: Operational activity is more contained and less visually intrusive compared to initial site preparation.
- Stabilized Landform: While the landform will continue to change, alterations will occur gradually and within the screened site, minimizing external perception.
- Duration: Short term, effects less than 7 years.

Overall, operational phase impacts are considered less significant than those during the construction phase, due to effective screening and the progressive concealment of infilling activities and the increasing distance between the main source of visual impact and receptors

and the proposed restoration of the lands to be returned to agricultural, forestry planting or amenity use.

As a result, the impacts are considered negative to neutral in quality, very low in magnitude, minor to negligible in significance, and short term (lasting less than 7 years) in nature.

11.5.3. Potential Cumulative Effects

Cumulative impacts can be described as impacts that result from changes caused by a development in conjunction with other past, present or reasonably foreseeable actions.

The Proposed Development delivers long-term positive landscape benefits by restoring a previously degraded cutover bog, improving soil profiles, and enabling future agricultural, forestry, or amenity use. The end-state landform is more coherent, more resilient, and more usable than the current condition. These long-term improvements outweigh the short-term, low-magnitude visual effects associated with construction and infilling. The proposed landform is low-lying and fully screened, and therefore does not increase the visual massing or the semi industrial character of the area.

In the context of landscape and visual impact and given the zoning and landscape character of the location of the Proposed Development and its surrounding environment, no cumulative effects are anticipated from the introduction of the Proposed Development alongside any existing or reasonably foreseeable actions .

11.5.4. “Do Nothing” Effect

The do-nothing impact refers to the non-implementation of the Proposed Development. The primary effect of this would be that the impacts and effects identified would not directly occur. A do-nothing scenario would result in the Site remaining as an existing scrubland site. If the Proposed Development were not to proceed, the existing Site would continue to be present in the landscape as it is.

11.6 Avoidance, Remedial & Mitigation Measures

11.6.1. Construction Phase

The key landscape and visual mitigation measures used during the construction phase have been incorporated;

- into the layout of the site largely away from public roads and general view,
- the quick establishment of perimeter native planting buffers
- machinery used in the construction phase will be similar in size and scale as that used in modern intensive agriculture/ forestry
- works limited to normal working hours 8am to 5pm Monday to Friday
- lighting to be non-intrusive and specifically designed to negate or minimise any effect to local properties and any other environmental considerations.
- It is recommended that some of the cleared scrub and vegetation, especially willow and birch offcut boughs/branches and stumps be placed along the boundary line and semi covered with c. 150mm of topsoil to facilitate hardwood propagation of locally established species. These boundaries will be defined with a post and wire fence of minimum height of 1m.

- Along the eastern boundary the removal of c. 25 multi stemmed hawthorn will be needed to facilitate sightlines. A 2.1m high palisade is proposed behind the sightlines and along the eastern boundary. It is recommended that this fence is black in colour as black recedes into the background more so than other colours. The existing vegetation along this line will be retained and reinforced with dense native planting screen of approximately 5m width.

11.6.2. Operational Phase

The key landscape and visual mitigation measures used during the operation phase are as for the construction phase above.

Machinery and materials used in the operation of the infilling will be similar in size and scale as that used in modern intensive agriculture.

It is recommended that the dense native planting screen planting consist of shrub willow, birch, hawthorn, guelder rose, hazel and holly mix at a 1m spacing and planted at a minimum height of 60-90cm, to ensure a quick dense, partially evergreen screen establishment. Along the palisade fence it is recommended that 175/200cm hawthorn plants at 1m spacings are used to ensure rapid screening of the exposed roadside boundary.

11.6.3. "Worst Case" Scenario

The worst-case effects arise when the mitigation measures as proposed substantially fail. As the design and layout is a major part of the mitigation and built into the proposed scheme it is highly unlikely that this would fail. If the proposed development were to start and not be completed it would become subject to local authority actions to remedy the situation. This would result in landscape and visual impacts lasting in the medium to long term as natural regeneration of pioneer species would be expected to grow and help mitigate impacts.

The failure of the proposed landscape mitigation measures is very unlikely. Also, if the proposed development is granted, the proposed mitigation measures will become a part of the plans and particulars of the planning application and as such can be made subject of an enforcement notice by the local authority to rectify the situation.

11.7 Residual Impacts

Residual impacts are defined as 'effects that are predicted to remain after all assessments and mitigation measures. They are the remaining environmental costs of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts. Potential residual impacts from the Proposed Development were considered as part of this environmental assessment. No negative residual impacts in the context of landscape and visual impact are anticipated regarding this Proposed Development.

11.8 Monitoring

11.8.1. Construction Phase

To ensure the successful implementation of the Proposed Development it is proposed that trees for retention have tree protection zones established around them in accordance with BS 5837:2012 trees in relation to Design, demolition and Construction – Recommendations

11.8.2. Operational Phase

To ensure the successful implementation of the Proposed Development it is proposed that a landscape architect is engaged to supervise and sign off on the successful establishment of the proposed boundary dense native screening.

11.9 Interactions

Interactions between Landscape and Visual Impact and other aspects of this Environmental Impact Assessment Report have been considered and are detailed below.

- Population and Human Health

It is not considered that the Proposed Development by virtue of its visual appearance of the Proposed Development and the nature of the surrounding landscape, will cause any issues for the residential local population.

- Biodiversity

The Site interacts with its biodiversity and ecology through the changes that will occur to the existing habitats and flora at the Site. The proposals will entail losses and contributions in terms of vegetation at the Site, which in turn will affect the ecology of the Site. Whilst the Site in its current condition is of good ecological value to a number of receptors, the proposed landscaping will not result in significant adverse effects provided all mitigations outlined within the bio chapter are implemented.

- Archaeology and Cultural Heritage

As there are no known archaeological or architectural remains found during the desk top survey as well as the walkover survey, it is not predicted that any changes in landscape or visual impact will affect in any way the archaeology of the area

11.10 Difficulties Encountered When Compiling

No significant difficulties were encountered during the landscape and visual impact assessment.

11.11 Conclusion

It is concluded that the Proposed Development will not result in any significant landscape or visual impacts.

The Proposed Development is consistent with the Lowland Landscape Character Area. The Proposed Development will not result in significant landscape or visual impacts and is

considered acceptable within the prevailing planning policy context and sustainable development objectives.

11.12 References

- Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (EIA Directive);
- The National Landscape Strategy (NLS) for Ireland 2015-2025.;
- Guidelines on the information to be contained in Environmental Impact Assessment Reports, Environmental Protection Agency (2022 (EPA Guidelines 2022)
- Guidelines for Landscape and Visual Impact Assessment, 3rd edition, 2013 (GLVIA), published by the Landscape Institute;
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment, 2018, published by the Department of Housing, Planning and Local Government;
- Technical Information Note on Townscape Character Assessment, 2016, published by the Landscape Institute;
- Residential Visual Amenity Assessment (RVAA) Technical Guidance Note 2/19, published by the Landscape Institute.
- Transport Infrastructure Ireland Publication no. PE-ENV-01101, published December 2020: Landscape Character Assessment (LCA) and Landscape and Visual Impact Assessment (LVIA) of Specified Infrastructure Projects - Overarching Technical Document
- Laois County Council County Development Plan 2021-2027

12 ARCHAEOLOGY AND CULTURAL HERITAGE

12.1 Introduction

This chapter of the EIAR was prepared to assess the impact, if any, on the archaeological and cultural heritage resource of the proposed development in the townland of Kyletalesha, County Laois (Figure 12-1; ITM 645542, 702851).

12.1.1 Quality Assurance and Competency of Experts

This chapter of the EIAR has been prepared by Johnnie Gallacher of IAC Archaeology. Johnnie holds MA and MLitt degrees in Archaeology and he is a Member of the Institute of Archaeologists of Ireland. Johnnie has carried out archaeology, architectural and cultural heritage assessments and has been involved in the preparation of EIARs for the following projects:

- Cahermurphy 2 Wind Farm, Co. Clare
- Clonburris residential sites 3, 4, 5, Co. Dublin
- Ninth Lock, Co. Dublin
- Lagan Homes Ballycullen development, Co. Dublin
- Adamstown Boulevard Phase 2, Co. Dublin
- Charlestown Place residential development, Co. Dublin
- Haggardstown residential development, Dundalk, Co. Louth

12.2 Study Methodology

A study area, defined as 500m from the boundary of the proposed development area, was assessed to inform this chapter. Research was undertaken in two phases. The first phase comprised a paper survey of all available archaeological, historical and cartographic sources. The second phase involved a field inspection of the site.

12.2.1 Paper Survey

- Record of Monuments and Places for County Laois;
- Sites and Monuments Record for County Laois;
- National Monuments in State Care Database;
- Preservation Orders List;
- Topographical files of the National Museum of Ireland;
- Cartographic and written sources relating to the study area;
- Laois County Development Plan (2021–2027);
- National Inventory of Architectural Heritage for County Laois;
- Aerial photographs;
- Excavations Bulletin (1970–2026).

Record of Monuments and Places (RMP) is a list of archaeological sites known to the National Monuments Section, which are afforded legal protection under Section 12 of the 1994 National Monuments Act and are published as a record (Volume 3: Appendix 12-1).

Sites and Monuments Record (SMR) holds documentary evidence and field inspections of all known archaeological sites and monuments. Some information is also held about archaeological sites and monuments whose precise location is not known e.g. only a site type

and townland are recorded. These are known to the National Monuments Section as ‘un-located sites’ and cannot be afforded legal protection due to lack of locational information. As a result, these are omitted from the Record of Monuments and Places. SMR sites are also listed on a website maintained by the Department of Housing, Local Government and Heritage (DoHLGH) – www.archaeology.ie (Volume 3: Appendix 12-1).

National Monuments in State Care Database is a list of all the National Monuments in State guardianship or ownership. Each is assigned a National Monument number whether in guardianship or ownership and has a brief description of the remains of each Monument. The Minister for the DoHLGH may acquire national monuments by agreement or by compulsory order. The state or local authority may assume guardianship of any national monument (other than dwellings). The owners of national monuments (other than dwellings) may also appoint the Minister or the local authority as guardian of that monument if the state or local authority agrees. Once the site is in ownership or guardianship of the state, it may not be interfered with without the written consent of the Minister (Volume 3: Appendix 12-1).

Preservation Orders List contains information on Preservation Orders and/or Temporary Preservation Orders, which have been assigned to a site or sites. Sites deemed to be in danger of injury or destruction can be allocated Preservation Orders under the 1930 Act. Preservation Orders make any interference with the site illegal. Temporary Preservation Orders can be attached under the 1954 Act. These perform the same function as a Preservation Order but have a time limit of six months, after which the situation must be reviewed. Work may only be undertaken on or in the vicinity of sites under Preservation Orders with the written consent, and at the discretion, of the Minister (Volume 3: Appendix 12-1).

The topographical files of the National Museum of Ireland are the national archive of all known finds recorded by the National Museum. This archive relates primarily to artefacts but also includes references to monuments and unique records of previous excavations. The find spots of artefacts are important sources of information on the discovery of sites of archaeological significance.

Cartographic sources are important in tracing land use development within the development area as well as providing important topographical information on areas of archaeological potential and the development of buildings. Cartographic analysis of all relevant maps has been made to identify any topographical anomalies or structures that no longer remain within the landscape.

Documentary sources were consulted to gain background information on the archaeological and cultural heritage landscape of the proposed development area.

Development Plans contain a catalogue of all the Protected Structures and archaeological sites within the county. The Laois County Development Plan (2021–2027) was consulted to obtain information on cultural heritage sites in and within the immediate vicinity of the proposed development area (Volume 3: Appendix 12-1 and Appendix 12-2).

The *NIAH* was established under the provisions of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999. It is a government-based organisation tasked with making a nationwide record of locally, regionally, nationally and internationally significant structures dating to post-1700 AD, which in turn provides local authorities with a guide as to what structures to list within the RPS. Only those structures of

regional importance or above are included in the Minister's recommendations for inclusion in the RPS (Volume 3: Appendix 12-2).

Aerial photographic coverage is an important source of information regarding the precise location of sites and their extent. It also provides initial information on the terrain and its likely potential for archaeology. A number of sources were consulted including aerial photographs held by the Ordnance Survey and Google Earth.

Excavations Bulletin is a summary publication that has been produced every year since 1970. This summarises every archaeological excavation that has taken place in Ireland during that year up until 2010 and since 1987 has been edited by Isabel Bennett. This information is vital when examining the archaeological content of any area, which may not have been recorded under the SMR and RMP files. This information is also available online (www.excavations.ie) from 1970–2026.

12.2.2 Field Inspection/Site Survey

Field inspection is necessary to determine the extent and nature of archaeological and historical remains, and can also lead to the identification of previously unrecorded or suspected sites and portable finds through topographical observation and local information.

The archaeological field inspection conducted on 28th January 2026 entailed the following. The results are described in Section 12.3.9.

- Walking the proposed development and its immediate environs.
- Noting and recording the terrain type and land usage.
- Noting and recording the presence of features of archaeological or historical significance.
- Verifying the extent and condition of any recorded sites.
- Visually investigating any suspect landscape anomalies to determine the possibility of their being anthropogenic in origin.

12.2.3 Relevant Legislation & Guidance

The assessment has been carried out in accordance with the following guidance and legislation:

- The National Monuments Act 1930 to 2014 and relevant provisions of the National Cultural Institutions Act 1997;
- The Planning and Development Acts, 2000 (as amended);
- Heritage Act, 1995 (as amended);
- Draft Advice Notes on Current Practice (in the preparation of Environmental Impact Statements), 2015, EPA;
- Guidelines on the Information to be contained in Environmental Impact Assessment Report 2022, EPA;
- Frameworks and Principles for the Protection of the Archaeological Heritage, 1999, (formerly) Department of Arts, Heritage, Gaeltacht, and Islands; and
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 2000 and the Local Government (Planning and Development) Act 2000.
 - See Volume 3 Appendix 12-1 for more details.

12.2.4 Sensitivity of Receptor

For each impact, the assessment identifies receptors sensitive to that impact and implements a systematic approach to understanding the impact pathways, magnitude and the level of effects on given receptors (Volume 3: Appendix 12-3).

The definitions of receptor sensitivity for the purpose of the archaeology and cultural heritage assessment are provided in Table 12-1. This is based on the presence (or not) of statutory protection and the determination by the author.

Table 12-1 Criteria for determination of receptor sensitivity

Sensitivity	Criteria
Very High	Sites of International Importance: UNESCO World Heritage Properties (including tentative list) National Monuments Monuments subject to Preservation Orders
High	RMP Proposed RMP Record of Protected Structures (RPS) Architectural Conservation Area (ACA) Well-preserved demesne landscapes Previously unrecorded archaeological sites
Medium	SMR Sites listed on the NIAH (upstanding) Buildings not on NIAH/RPS (based on professional judgement) Moderately well-preserved demesne landscapes Townland boundaries
Low	Buildings not on NIAH/RPS (based on professional judgement) Poorly preserved demesne landscapes
Very Low	SMR – Record only or redundant record Proposed RMP – excavated Fully developed demesne landscapes

12.2.5 Magnitude of Impact

The scale or magnitude of potential impacts (both beneficial and adverse) depends on the degree and extent to which the Proposed Project may change the environment, which usually varies according to project phase (i.e. construction, operational, and decommissioning).

As per EPA, 2022, the nature of impacts can be categorised as follows:

- Quality: Positive, neutral or negative
- Nature: Direct, indirect
- Probability: Likely or unlikely
- Duration: Momentary, brief, temporary, short-term, medium-term, long-term, permanent, reversible
- Frequency: Once, rarely, occasionally, frequently, constantly

The criteria used to assess the different impacts associated with the proposed development are shown in Table 12-2. The criteria have been defined in consideration of EPA, 2022.

Table 12-2 Criteria for determination of Magnitude of Impact

Magnitude	Criteria
Very High	These impacts arise where an archaeology or cultural heritage site, either below ground or upstanding, is completely and irreversibly destroyed.
High	An impact which, by its magnitude, duration or intensity, alters an important aspect of the archaeological and cultural heritage environment, including the setting of upstanding monuments. An impact like this would be where part of a site would be permanently impacted upon, leading to a loss of character, integrity and data about an archaeological or cultural heritage feature/site.
Medium	A medium impact arises where a change to a site/monument is proposed which though noticeable, is not such that the archaeological or cultural heritage integrity of the site is compromised. The change is likely to be consistent with existing and emerging trends. Impacts are probably reversible and may be of relatively short duration.
Low	An impact which causes changes in the character of the environment, such as a visual impact, which are not high or very high and do not directly impact or affect an archaeological or cultural heritage feature or monument.
Very Low	An impact on an archaeological or cultural heritage feature or monument capable of measurement but without noticeable consequences.

12.2.6 Significance of Effects

An Impact Assessment Matrix (IAM) is used to determine the significance of an effect. In basic terms, the potential significance of an effect is a function of the sensitivity of the receptor and the magnitude of the impact, as shown in Table 12-3.

The matrix provides a framework for the consistent and transparent assessment of predicted effects although it is important to note that the assessments are based on the application of expert judgement.

The matrix provides levels of effect significance ranging from imperceptible to profound. For the purposes of this assessment, potential effects identified to be of significant significance or above (i.e., significant, very significant or profound) are considered to be “significant in EIA terms” and additional mitigation will be required. Potential effects identified as less than significant (i.e. moderate, slight, imperceptible or not significant) significance are generally considered to be not significant in EIA terms.

Table 12-3 Impact Assessment matrix for determination of significant of effect

Sensitivity of Receptor	Magnitude of Impact				
	Very High	High	Medium	Low	Very Low
Very High	Profound	Very Significant	Significant	Moderate	Slight
High	Very Significant	Significant	Significant - Moderate	Moderate - Slight	Not Significant

Medium	Significant	Significant - Moderate	Moderate	Slight	Imperceptible
Low	Moderate	Moderate - Slight	Slight	Not Significant	Imperceptible
Very Low	Slight	Not Significant	Imperceptible	Imperceptible	Imperceptible

12.3 The Existing and Receiving Environment (Baseline Situation)

12.3.1 Archaeological and Historical Background

The proposed development area is located in the townland of Kyletalesha, within the parish of Borris, in the barony of Maryborough East, in County Laois (Figure 12-1; ITM 645542, 702851). The site comprises part of an unenclosed, densely overgrown area of cutover bog. The site is bound by the L2117 local road to the east, by a field of good pasture to the northeast, and by rough pasture/scrubs/marginal lands on all other sides. The western site boundary comprises the Kyletalesha-Clonsoghey townland boundary. There are no recorded monuments, NIAH structures or Protected Structures within the proposed development area or the wider 500m study area.



Figure 12-1 Proposed site showing nearby townland boundaries and recorded archaeological sites

12.3.2 Prehistoric Period

12.3.2.1 Mesolithic Period (c. 8000–4000 BC)

Recent discoveries in Ireland may suggest the possibility of a human presence in the southwest of Ireland as early as the Upper Palaeolithic (Dowd and Carden 2016); however,

the Mesolithic period is the earliest time for which there is clear evidence for prehistoric human colonisation of the island of Ireland. During this period people hunted, foraged and gathered food and appear to have led a primarily mobile lifestyle. The presence of Mesolithic communities is most commonly evidenced by scatters of worked flint material, a by-product of the production of flint implements.

There is precedent for Mesolithic remains being preserved within bog peatland environments similar to the proposed development area. In Bord na Móna's Lough Boora Discovery Park, c. 30.5km northwest, for example, charcoal remains of ancient campfires were uncovered (<https://www.loughboora.com/our-story/archaeology/>). Associated with these were around 1,500 artefacts, many of them carefully worked black stone tools made of chert. The campfire sites, dated to between 6800 and 6500 BC, were the temporary campsites of hunters.

There is no archaeological evidence of Mesolithic activity within the immediate environs of the proposed development area.

12.3.2.2 Neolithic Period (c. 4000–2500 BC)

During this period communities became less mobile and their economy became based on the rearing of stock and cereal cultivation. The transition to the Neolithic was marked by major social change. Communities expanded and established more permanent settlements. This afforded the development of agriculture, which demanded an altering of the physical landscape. Forests were rapidly cleared and field boundaries were constructed. Pottery was also being produced, possibly for the first time. The advent of the Neolithic period also provided the megalithic tomb. There are four types of tombs in Ireland, namely the Court Cairn, Portal tomb, Passage tomb and Wedge tomb; of which the latter style straddles the Neolithic to Bronze Age transition.

Wetland environments in the midlands of the country have been shown to preserve the remains of wooden trackways utilised in the Neolithic and later prehistoric periods. No evidence for any such features were exposed during the peatland milling in the study area during the 20th century. Excavations in 1993 as part of the N7 Portlaoise Bypass (Bennett 1993:140; Licence No. 93E0023) at The Heath, c. 6.5km to the southeast of the proposed development area, revealed evidence for late Neolithic activity in the form of charcoal spreads, pits and in excess of 400 stake holes forming a series of parallel lines. The diagnostic material, which supports late Neolithic-early Bronze Age dating, included waste and worked flints; sherds of pottery (including Irish Grooved Ware and Cordoned Urns) and paleoenvironmental remains in the form of carbonised cereal grains.

While recent years have seen a large increase in the number of identified Neolithic settlement and habitation sites, there is no archaeological evidence to substantiate significant Neolithic settlement within the immediate environs of the proposed development area.

12.3.2.3 Bronze Age (c. 2500–800 BC)

This period is marked by the use of metal for the first time. As with the transition from Mesolithic to Neolithic, the transition into the early Bronze Age was accompanied by changes in society. Megalithic tombs were replaced in favour of individual, subterranean cist or pit burials that were either in isolation or in small cemeteries. These burials contained inhumed or cremated remains and were often, but not always, accompanied by a pottery vessel.

A Late Bronze Age hoard of bronze objects was uncovered in Ballytegan townland, c. 2km south of the proposed development area (NMI Ref. 1967:1-60). There is however no archaeological evidence of Bronze Age activity, such as the remains of wooden trackways or working platforms, within the immediate environs of the proposed development area.

12.3.2.4 Iron Age (c. 800 BC–AD 500)

There is increasing evidence for Iron Age settlement and activity in recent years as a result of development-led excavations as well as projects such as Late Iron Age and Roman Ireland (Cahill Wilson 2014). Yet this period is distinguishable from the rather rich remains of the preceding Bronze Age and subsequent early medieval period, by a relative paucity within the current archaeological record. The Iron Age in Ireland is problematic for archaeologists as few artefacts dating exclusively to this period have been found and without extensive excavation it cannot be determined whether several monument types, such as ring-barrows or standing stones, date to the late Bronze Age or Iron Age. It is likely that there was significant continuity in the Iron Age, with earlier monuments re-used in many cases.

No archaeological remains dating to this period have been identified within the study area; however, archaeological monitoring conducted during construction of the N7 Portlaoise Bypass identified an extensive Iron Age complex and associated features in the townland of Ballydavis, c. 5.9km east-southeast. This comprised four ring-ditches, seven furnaces and a series of postholes and pits; now recorded in the SMR as LA013-112001-004.

12.3.2.5 Early Medieval Period (AD 500–1100)

The early medieval period is depicted in the surviving sources as an almost entirely rural based society. Territorial divisions were based on the *túath*, or petty kingdom, with Byrne (1973) estimating that there may have been at least 150 kings in Ireland at any given time. This period, with a new religious culture and evolving technologies, saw significant woodland clearance and the expansion of grassland. A new type of plough and the horizontal mill were two innovations that improved agriculture and allowed for the population to increase. Consequently, from c. AD 500 onwards, the landscape became well settled, as evidenced by the profuse distribution of ringforts, a dispersed distribution of enclosed settlements, normally associated with various grades of well-to-do farming and aristocratic classes in early medieval Ireland (Stout and Stout 1997, 20).

The ringfort or rath is considered to be the most common indicator of settlement during the early medieval period (Stout 1997). One of the most recent studies of early medieval settlement enclosures has suggested that there is potential for at least 60,000 such sites to have existed on the island (O'Sullivan et al. 2014, 49). Enclosure sites belong to a classification of a monument whose precise nature is unclear. Often, they may in fact represent ringforts, which have either been damaged to a point where they cannot be positively recognised or which are smaller or more irregular in plan than the accepted range for a ringfort. An early medieval date is generally likely, although not a certainty. Enclosure sites are situated c. 642m southeast, c. 1.76km south, and c. 2.50km north of the proposed development area (LA013-001; LA013-002; LA008-006).

The early medieval period marked the arrival of Christianity in Ireland, which was to have a profound impact on the country. This is evidenced by the proliferation of ecclesiastical sites throughout the country during this period. A church site is situated c. 1.17km south-southeast of the proposed development area. No visible surface remains survive and it may have origins

in the early medieval period. There is additionally a holy well site (LA012-001) situated c. 5km southwest of the proposed development area. The veneration of well sites is one of the oldest traditions in Irish Christianity and most likely has its origins in pagan ritual activities. These wells can manifest themselves in a variety of forms ranging from natural springs to rain collecting rock depressions.

There is no archaeological evidence of early medieval activity within the 500m of the proposed development area.

12.3.2.6 Medieval Period (AD 1100–1600)

The piecemeal conquest by the Anglo-Normans of Ireland, which commenced in AD 1169, had a fundamental impact on the Irish landscape. Their presence was strongest in the East of the Country, and it is mainly in this region that land was carved up and granted to the newly arrived lords who participated. The main success of the Anglo-Norman occupation was the welding of scattered territories into a cohesive unit through the introduction of the English form of shire government. The rural landscape became a network of manorial centres; these units would generally contain a castle (motte and bailey), a manorial house and a number of dwellings, with extensive surrounding acreage.

The nearest castle site comprises tower house (LA013-019), located c. 2.56km south-southwest of the proposed development area. It is believed to have been owned by the O'Dowlings, one of the seven septs of Laois, before it was granted to John Dunkirley by the crown in 1550 (SMR File). There is no archaeological evidence of medieval activity within the 500m of the proposed development area.

12.3.2.7 Post-Medieval Period (AD 1600–1800)

The ending of the Williamite Wars saw the beginning of a comparative politically calm era, which allowed the country's landowners the security to experiment with the latest styles of architecture without the need to refer to defensive matters. Initially, constraints on available resources resulted in mansions of a relatively modest scale and relatively plain appearance. However, as the Irish aristocracy's sense of security grew over the following decades, their greater access to wealth helped foster a shift towards more ostentatious buildings. Buildings of architectural heritage value in the vicinity of the proposed development area include include Borris House, c. 3.06km southeast, and Sheen House, c. 4.65km east.

During the Napoleonic Wars (1803–1815), Sir Arthur Wellesley, the future Duke of Wellington, advocated the setting up of a commission to enquire into possible land improvement of Irish bogs (<https://www.bordnamonalivinghistory.ie/maps/history-of-maps/>). His intention was to transform boglands into agricultural areas where flax could be grown. Flax was much needed for wartime rope and sail production. Due to various reasons, including the fact that the British Government was short of money after the Napoleonic Wars, the proposals in the reports were not acted upon. Nonetheless, the proposed development area was mapped by the Bog Commission and as a result of this action we have good pre-ordnance survey illustration of the study area. It is clear that 'Derrygyle Bog' was being actively drained at this time (Figure 12-2). By the time of the 1840s the study area is shown within a large unenclosed parcel of marginal bogland (Figure 12-3).

12.3.3 Summary of Previous Archaeological Fieldwork

A review of the Excavations Bulletin (1970–2026) has revealed that no previous archaeological investigation have been carried out within the proposed development area or the 500m study area.

The files of the National Museum of Ireland records that in October 2,000 fragments of a human skull (LA008-065) were discovered in dredged material from the river Triogue which is the boundary between the townlands of Kyletalesha and Knocknagroagh, Co. Laois (Cahill & Sikora 2011, Vol. 2, 490) c. 1.65km east-northeast of the study area. The site was investigated by the State Pathologist, Dr John Harbison, and the Museum was not informed until after this time. A site visit was then carried out by Mary Cahill. Unfortunately, the site had been heavily disturbed at this stage, and no further remains were recovered (Bennett 2000:1133).

12.3.4 Cartographic Analysis

12.3.4.1 *Sir William Petty, Down Survey: Map of the Barony of Maryborough c. 1656-58*

This map depicts the proposed development area in the barony of 'Mariburogh' and the parish of 'Burres', situated north of 'Marriburogh towne' (modern day Port Laois). The proposed development area is depicted at such a high level that little further detail can be gleaned.

12.3.4.2 *Richard Griffith, Map of the Bogs of Allen in Kings and Queens County, Drawn by order of the Commissioners for the Improvement of Bogs in Ireland, 1810 (Figure 12-2)*

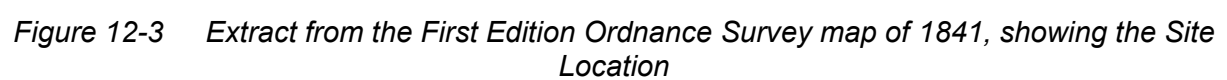
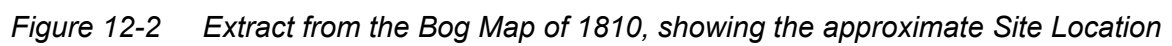
This map, while not accurate to scale, shows further topographical detail than previously presented. Kyletalesha townland is annotated 'Kyle Colleesha'. The road between Maryborough (modern Port Laois) and Mount Mellick is shown running northwards through Derrygyle Bog. The proposed development area is located within this bog and linear drains are illustrated running approximately north–south indicating that the land is being drained by this time. No structures or features of archaeological potential are shown within the proposed development area.

12.3.4.3 *First Edition Ordnance Survey Map, 1841, scale 1:10,560 (Figure 12-3)*

This is the first accurate historic mapping coverage of the area containing the proposed development. The site is shown within a single large unenclosed parcel of bogland. It is bound to the west by the Kyletalesha-Clonsoghey townland boundary, and to the east by a northeast aligned road (the modern day L-2117). The 500m study area is predominantly characterised by bogland, though it also contains part of the road to Mount Mellick to the west, and some arable/pastoral fields and housing in the east. No structures or features of archaeological potential are shown within the proposed development area.

12.3.4.4 *Ordnance Survey Map, 1909, scale 1:2,500 (Figure 12-4)*

There has been relatively little change from the previous mapping to the proposed development area and wider 500m study area. It is clear that land to the south of the road is beginning to be reclaimed. A pathway now runs through the site. Immediately east and southeast of the site, an area of forestry has been planted into the bog. The Mountmellick branch line of the Great Southern and Western Railway is depicted c. 1.37km to the west.



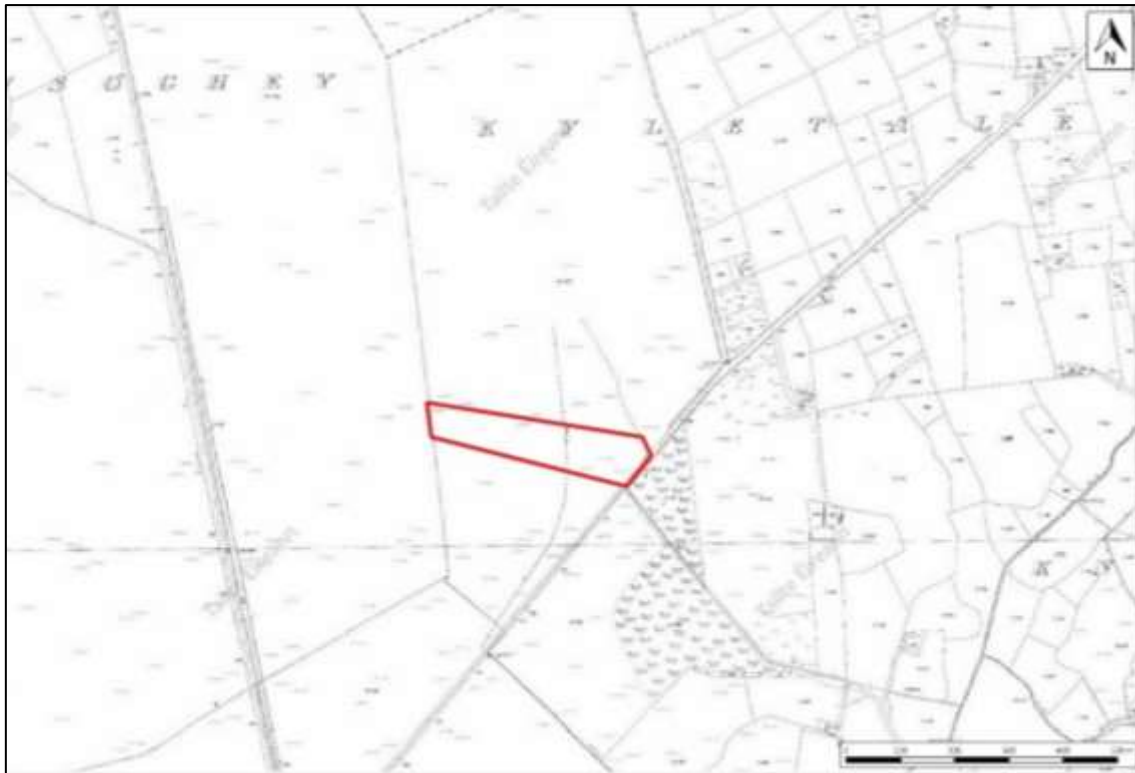


Figure 12-4 Extract from the Ordnance Survey map of 1909, showing the Site Location

12.3.5 County Development Plan

The Laois County Development Plan (2021–2027) recognises the statutory protection afforded to all Record of Monuments and Places (RMP) sites under the National Monuments Legislation (1930–2014). The development plan lists a number of aims and objectives in relation to archaeological heritage (Volume 3 Appendix 12-1).

There are no recorded monuments, NIAH structures or Protected structures within the proposed development area or the wider 500m study area. The nearest recorded monument comprises enclosure (LA013-001), located c. 642m east-southeast. The nearest NIAH structure and Protected Structure both comprise Clonreher House (NIAH Ref. 12801307; RPS Ref. 445) which is located c. 2.28km south-southwest of the proposed development area.

12.3.6 Cultural Heritage

The term ‘cultural heritage’ can be used as an over-arching term that can be applied to both archaeology and architectural sites; however, it also refers to more ephemeral aspects of the environment, which are often recorded in folk law or tradition or possibly date to a more recent period. The archaeological sites discussed above should also be considered cultural heritage and the townlands and placename analysis detailed below are also of cultural heritage significance.

As the proposed development area is situated within bogland, it would have been subject to traditional turf cutting on numerous occasions. Most of the peat/turf has now been removed down to the mineral subsoil.

The Ordnance Survey map of 1909 depicts the Mountmellick branch line of the Great Southern and Western Railway, c. 1.37km to the west of the proposed development area. This was a very short branch line, (c. 7.5 miles), which ran from the terminus in Mountmellick, south to the Portlaoise station, where it connected to the rest of the Irish railway network (http://eiretrains.com/Photo_Gallery/Railway%20Stations%20M/Mountmellick/IrishRailwayStations.html). The Mountmellick line was removed in the mid-20th-century, however the station in Portlaoise remains active.

12.3.7 Topographical Files of the National Museum of Ireland

Information on artefact finds from the study area in County Laois has been recorded by the National Museum of Ireland since the late 18th century. Location information relating to these finds is important in establishing prehistoric and historic activity in the study area. No stray finds are recorded from within the townlands of Kyletalesha, Kyleclonhobert or Clonsoghey within the study area.

12.3.8 Aerial Photographic Analysis

Inspection of the aerial photographic coverage of the proposed development area held by the Ordnance Survey (1995–2013), Google Earth (2008–2026), Bing Maps and Apple Maps has been carried out as part of this assessment. This also included a review of the LiDAR data available on the Open Topographical Data Viewer.

Over this period the site has remained as reclaimed rough, marginal pasture. In 1995, industrial facilities were present adjacent to the site, to the southwest. These were expanded during the 1990s and early 2000s. The western quarter of the proposed development area has been subject to LiDAR survey, which has identified a field boundary (Figure 12-5). There have been no significant changes within the site boundary since 1995. While the LiDAR coverage doesn't include the proposed development area the former land drains are clear running east-west in this area. No previously unrecorded sites of archaeological potential were noted within the aerial coverage.

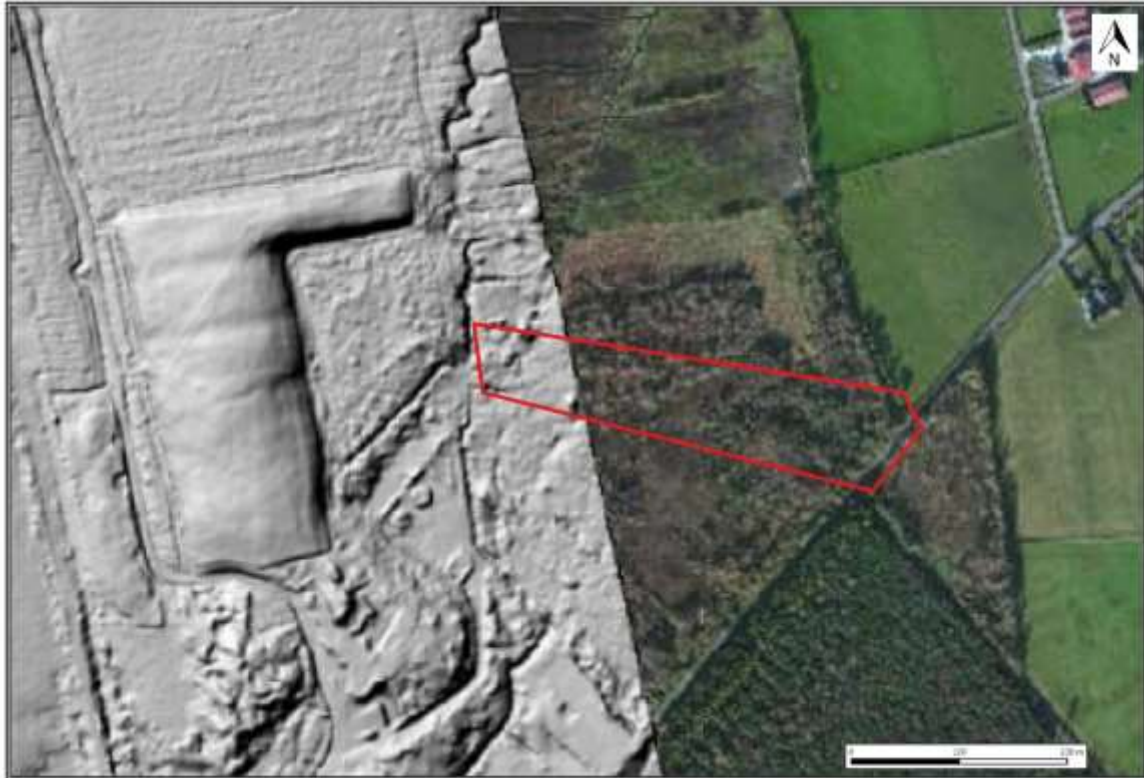


Figure 12-5 Extract from the Open Topographical Data Viewer's LiDAR imagery, showing the Site Location

12.3.9 Field Inspection

The field inspection was conducted on 28th January 2026. It sought to assess the site, its previous and current land use, the topography and any additional information relevant to the report. During the course of the field investigation the proposed development site and its surrounding environs were inspected (Figure 12-1).

The site comprises a relatively flat and unenclosed, densely overgrown area of former cutover bog (Plate 12.1). The far east of the site was accessed via a track which leads through a tree break into a densely wooded area containing mature coniferous and deciduous trees (Plate 12.2). Other vegetation included heather and bracken. There is an area in the centre of the site where the only trees are young saplings (Plate 12.3). Holes in the ground, obscured by vegetation, were present throughout the site. The far west of the site, including the Kyletalesha-Clonsoghey townland boundary, was not accessed due to these trip hazards and the impenetrability of the bushes (Plate 12.4).

No previously unrecorded features or areas of archaeological potential were noted during the course of the field inspection. Most of the peat/turf appeared to have been removed down to the mineral subsoil, meaning that any archaeological remains that had the potential to present have probably already been removed.



Plate 12-1 View of the unenclosed and thickly wooded site, from the L2117, facing northwest



Plate 12-2 Overgrown track leading into the northeast of the site, facing west



Plate 12-3 *The less vegetated centre of the site, facing east towards the L2117*



Plate 12-4 *Example of the site's impenetrable overgrowth, facing west from the centre of the site*

12.4 Characteristics of the Proposed Development

12.4.1 Construction Phase

The construction phase of the Proposed Development as described in Chapter 2 will require the clearance of majority self-seeded trees and vegetation across the site, together with a series of enabling works to prepare the area for the subsequent infilling and regrading operations. The roadside boundary hedge on the northern and eastern sides of the site will require partial removal as necessary to facilitate sightlines and access. As the land parcel is comprised of cutover bog, there is no defined internal hedgeline or fenceline. Upon first establishing and delineating the registered boundary, any trees or planting along the boundary will, where possible, be retained.

These preparatory works will also include the installation of temporary site fencing, the establishment of buffer strips to adjoining lands, the protection of existing site drainage infrastructure, the construction of a Temporary Construction Compound (TCC), and the formation of the site access, including road widening works.

Minimal excavation works are anticipated. These include foundations for gate hanger/fence posts, localised drainage works for the widened access road, soakaway infiltration area.

Given the extent of previous ground disturbances, it is likely that this disturbance would have led to the removal of any archaeological remains that may have been present. As such, no impacts are predicted upon the archaeological resource as a result of the development going ahead.

12.4.2 Operational Phase

The operational phase will consist of the infilling activities.

12.5 Potential Impact of the Proposed Development

12.5.1 Construction Phase

The results of the overall assessment at Kyletalesha indicate that there is low potential for archaeological remains to survive within the proposed development area. Notwithstanding this it is possible that ground disturbances associated with the proposed development may directly impact on any small or isolated archaeological features or artefacts that have the potential to survive within the site with no surface expression. Prior to the application of mitigation, impacts may range from moderate to significant negative.

The western site boundary comprises the Kyletalesha-Clonsoghey townland boundary. Ground disturbances associated with the development may result in a direct, negative and permanent impact on any remains of the section of townland boundary located alongside the western site boundary. Any such effect would be slight negative in terms of significance

12.5.2 Operational Phase

No direct or indirect negative impacts are predicted as a result of the operation of the proposed development, in relation to recorded archaeological and cultural heritage sites.

12.5.3 Potential Cumulative Impacts

All permitted or proposed developments within the study area, where construction has not commenced, have been reviewed. No cumulative effects have been identified on the archaeological or cultural heritage significance.

12.5.4 “Do Nothing” Impact

If the proposed development were not to proceed there would be no negative impact on the archaeological or cultural heritage resource.

12.6 Avoidance, Remedial & Mitigation Measures

12.6.1 Construction Phase

A programme of archaeological monitoring will be carried out across the development area, prior to the commencement of construction. This will be undertaken under licence from the National Monuments Service. Dependant on the results of the assessment, further mitigation may be required, such as preservation *in situ* or by record or archaeological monitoring. Any further mitigation will require approval from the National Monuments Service of the DoHLGH (see Volume 3: Appendix 12-4 for more details).

12.6.2 Operational Phase

No mitigation is required.

12.6.3 “Worst Case” Scenario

Under a worst-case scenario, the proposed development would disturb previously unrecorded and unidentified archaeological deposits and artefacts without proper excavation and recording being undertaken.

12.7 Residual Impacts

Following the implementation of the above mitigation measures, there will be no significant residual impacts upon the archaeological or cultural heritage resource.

12.8 Monitoring

The mitigation measures recommended above would also function as a monitoring system to allow the further assessment of the scale of the predicted impacts and the effectiveness of the recommended mitigation measures.

12.9 Interactions

No interactions have been identified.

12.10 Difficulties Encountered When Compiling

No difficulties were encountered during the compilation of this chapter.

12.11 Conclusion

This assessment has been prepared to study the impact, if any, on the archaeological and cultural heritage resource of the proposed development in the townland of Kyletalesha.

The site comprises part of an unenclosed, densely overgrown area of a cutover bog. Most of the peat/turf has now been removed down to the mineral subsoil, meaning that any archaeological remains present have probably already been removed. Notwithstanding this, wetland environments have been found to preserve remains of prehistoric and medieval wooden trackways and occupation activity. No such remains are recorded in Ballygile Bog to date.

There are no recorded monuments within the proposed development area or within 500m. No previous archaeological fieldwork has been carried out within the area of development. Reviews of the aerial photographic and historic mapping coverage failed to identify any previously unrecorded sites of archaeological potential within the development area. A field inspection has been carried out as part of this assessment. No previously unidentified archaeological features were identified.

While the archaeological potential is deemed to be fairly low, it is possible that previously unrecorded archaeological remains survive within the bogland environment with no surface expression. If present, ground disturbances associated with the proposed development may have adverse impacts on any such archaeological features or deposits that have the potential to survive beneath the current ground level.

It is recommended that all ground disturbances (including excavation for foundations for gate hanger/fence posts, localised drainage works for the widened access road, soakaway infiltration area) associated with the proposed development be monitored by a suitably qualified archaeologist. If any features of archaeological potential are discovered during the course of the works further archaeological mitigation may be required, such as preservation *in situ* or by record. Any further mitigation will require approval from the National Monuments Service of the DoHLGH.

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Ordnance Survey maps of County Laois, 1841 and 1909

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www.archaeology.ie – DoHLGH website listing all SMR/RMP sites.

www.heritagemaps.ie – The Heritage Council web-based spatial data viewer which focuses on the built, cultural and natural heritage.

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13 MATERIAL ASSETS: TRAFFIC AND TRANSPORT

13.1 Introduction

Transport Insights has been appointed by DNV on behalf of BM Lynch Construction & Civils Limited, to prepare an Environmental Impact Assessment Report (EIAR) Traffic Chapter in relation to a proposed infilling site at Kyletalesha, Portlaoise, County Laois.

13.1.1 Quality Assurance and Competency of Experts

The Traffic Chapter of the EIAR was prepared by Eoin Munn as Project Director and Aoife O'Donnell as Project Manager (both of Transport Insights Limited). Details of their experience and qualifications are provided within the following table (Table 13-1).

Table 13-1 Competency of Chapter Authors

Reviewer	Eoin Munn
Title	Director (Project Manager)
Relevant Experience and Qualifications	<u>Experience</u> Over 14 years' experience working within Transport Planning and Engineering, including project management of a variety of small to large sized projects from feasibility to detailed design stage. Recent EIAR experience includes preparing EIAR Traffic Chapters for an infill development in Co. Wicklow and a composting plant in Co. Cork. <u>Qualifications:</u> • BSc Transport Operations, Technological University Dublin (2003-2007) • MSc Business Analytics, University College Dublin (2007-2008) • Member, Transport Planning Society (MTPS)
Principal Author	Aoife O'Donnell
Title	Consultant Transport Planner
Relevant Experience and Qualifications	<u>Experience:</u> Aoife has 2 years' experience working within Transport Planning and Engineering, on a variety of public and private sector projects. Recent EIAR experience includes a quarry expansion in Co. Wicklow and a proposed waste management facility in Co. Wexford. • B.A in City Planning and Environmental Policy (2022) • MSc in Spatial Planning Land and Real Estate Development, Radboud Universiteit (2024)

13.1.2 Contents

The remainder of the chapter is structured as follows:

- Section 13.2 outlines the methodology pursued in undertaking the study;
- Section 13.3 describes the proposed development's receiving environment;
- Section 13.4 outlines the key traffic and transport related characteristics of the proposed development;
- Section 13.5 outlines potential construction and operational phases' traffic impacts arising from the proposed development;

- Section 13.6 details any avoidance, remedial & mitigation measures;
- Section 13.7 addresses any residual impacts;
- Section 13.8 addresses any monitoring measures;
- Section 13.9 states any interactions between the information presented in this EIAR Chapter and any other areas addressed as part of the EIAR;
- Section 13.10 states any difficulties in compiling the information set out within this chapter; and
- Section 13.11 provides a list of references.

13.2 Study Methodology

This section of the EIAR outlines the methodology followed in order to carry out the Traffic and Transport Assessment set out within this Chapter. The approach pursued in undertaking the Assessment has been guided by and is consistent with the national best practice, namely Transport Infrastructure Ireland's (TII's) Traffic and Transport Assessment Guidelines (May 2014).

The existing conditions on the surrounding road network were informed by a comprehensive site assessment undertaken on Thursday 12 February 2026 and a 24-hour classified Automatic Traffic Count (ATC) survey of the L2117. The traffic survey was undertaken on 27 January 2026. The survey results were then used to establish a baseline from which to predict future traffic on the local road network. The Do-Nothing scenario, the scenario in which the proposed development does not proceed, was established for the YoO (Year of Opening) and YoO +5 years. This was then compared to Do Something scenario which applies the potential development traffic to the local road network in the YoO and YoO+5 assessment years.

A first principles approach to development traffic generation was completed, based on the proposed annual tonnages of material to be processed, HGV payload and proposed number of working days per year. The results of this analysis were then used to predict the impact of the proposed development on the local road network.

Impact assessment takes into account the baseline traffic on the L2117, and the additional traffic generated from the proposed development.

A comprehensive list of guidance documents that have informed specific parts of the Assessment is set out in Section 13.11 of this EIAR Chapter.

13.3 The Existing and Receiving Environment (Baseline Situation)

13.3.1 Site Location

The proposed development site is located 4.6km to the north of Portlaoise Town, Co. Laois. The site is currently accessed via a clearing off the local access lane located on the east boundary of the site. The access lane connects with the L2117 ca. 10 metres southeast of the existing field gate. The L2117 connects to the N80 and the national road network ca. 1 km southwest of the application site. The site location can be seen in Figure 13.1 (overleaf).

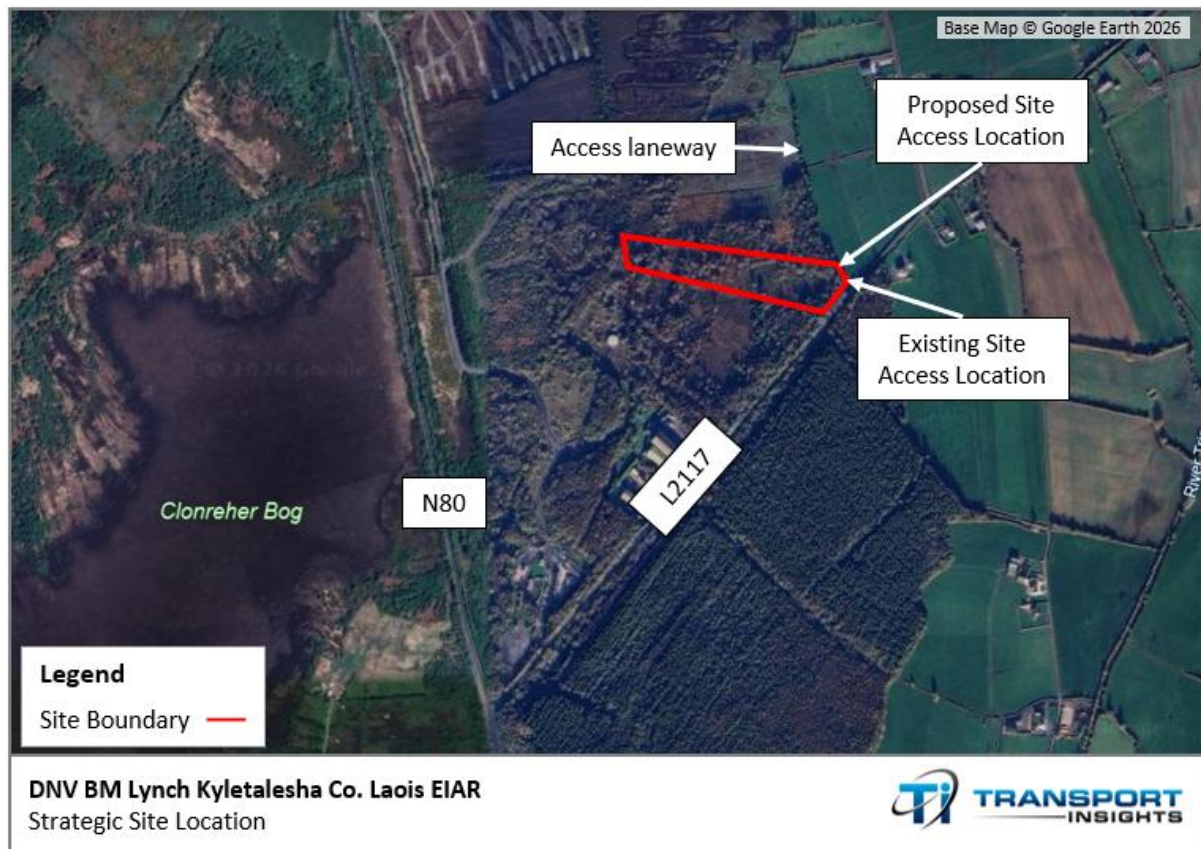


Figure 13.1: Proposed Development Site Location

13.3.2 Existing Site Access

The lands comprising the Proposed Development site consist of Cutover bog. Although the precise historical land use is not documented, it is considered likely that limited, non-commercial peat extraction took place on the lands in the past. The site is currently accessed via an existing field gate off the local access lane located on the east boundary of the site. The access lane connects with the L2117 ca. 10 metres southeast of the existing field gate. The site and access gate are almost entirely unused.



Figure 13.2: Existing Site Access and Local Access Laneway

13.3.3 Existing Site Layout

The proposed infilling and recontouring development will be located on land that is currently wet in nature and is characterised by an overgrowth of self-seeded trees and ground vegetation that has established over time following the cessation of peat-related activity. The site is located ca. 4.6 km (straight-line distance) north of the Portlaoise. The existing site extends to ca. 2.92 hectares. The site is currently accessed via a clearing off the local access lane located on the east boundary of the site. The access lane connects with the L2117 ca. 10 metres southeast of the existing field gate. The L2117 connects to the N80 and the national road network ca. 1km southwest of the application site.

The existing site access location can be seen in the preceding Figure 13.1 and 13.2.

13.3.4 Local Road Network

The layout of the local road network in the vicinity of the proposed development site is shown in Figure 13.3 (overleaf). The technical characteristics, layout and operation of these roads are described further in the following sections.

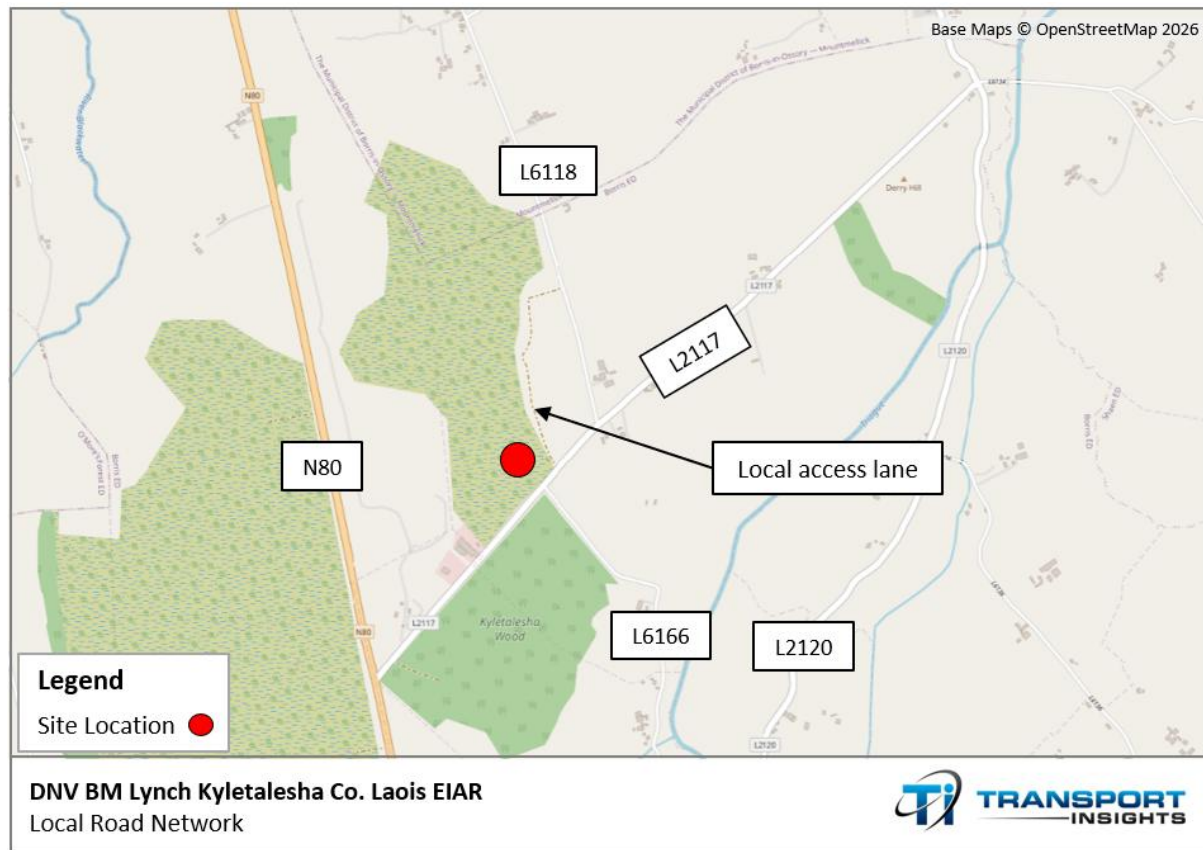


Figure 13.3: Local Road Network

13.3.4.1 L2117 Local Road

The L2117 is a two-way local road that runs in an approximate south-west to north-east alignment connecting the N80 in the south-west ca. 960m from the site, to the L2120 in the northeast. Within the vicinity of the site, the carriageway is ca. 5.5 metres wide. A speed limit of 80kph is in operation on the L2117 in the vicinity of the site. No centreline is provided on the extent of the road. The L2117 has both uniform vertical and horizontal alignment in the vicinity of the proposed site access location.

The existing site access is located on a local access lane at the eastern boarder of the site. The local access lane has one traffic lane and is ca. 4.5 metres wide. It connects the L2117 in the south, to the L6118 Kyletalesha in the northeast. The Local Access Lane/ L2117 junction is located ca. 10 metres south of the existing field gate on the site, and ca. 90 metres south of the new proposed site access location. The junction is priority controlled, with traffic on the local access lane yielding to traffic on the L2117.



Figure 13.4: Access Laneway



Figure 13.5: L2117 (facing west)

13.3.4.2 N80

The N80 is national road with an approximate northwest-southeast alignment that connects the N52 in the northwest near Tullamore, to the M9 in the southeast near Carlow. It primarily has one traffic lane per direction and no hard shoulder. In the vicinity of the junction with L2117, there is a right-turn lane for traffic accessing the L2117 from the south. A double white broken centre-line, that transitions into a hatched traffic island, is located on either end of the right-turn lane. The roadway in the vicinity of the L2117 junction is ca. 10 metres wide. N80 has a posted speed limit of 100km/h.



Figure 13.6: N80 (Facing south)

13.3.4.3 Junction N80/L2117

The junction where the L2117 connects with the N80 is ca. 960 metres southwest of the application site. The junction is a stop-controlled 3-armed junction with traffic on the L2117 stopping for traffic on the N80. Stop signs and road markings are provided on the L2117.

The posted speed limit on the N80 is 100km/h in the vicinity of the junction. The L2117 has a posted speed limit of 80km/h in the vicinity of the junction.



Figure 13.7: Junction N80/L2117 (Facing west)

Existing Traffic Flows

To determine baseline traffic conditions in the vicinity of the site, a 12-hour automatic traffic count (ATC) survey was undertaken on the L2117 in the vicinity of the proposed site access location on Tuesday 27 January 2026. The survey location is shown at Figure 13.8 (overleaf).

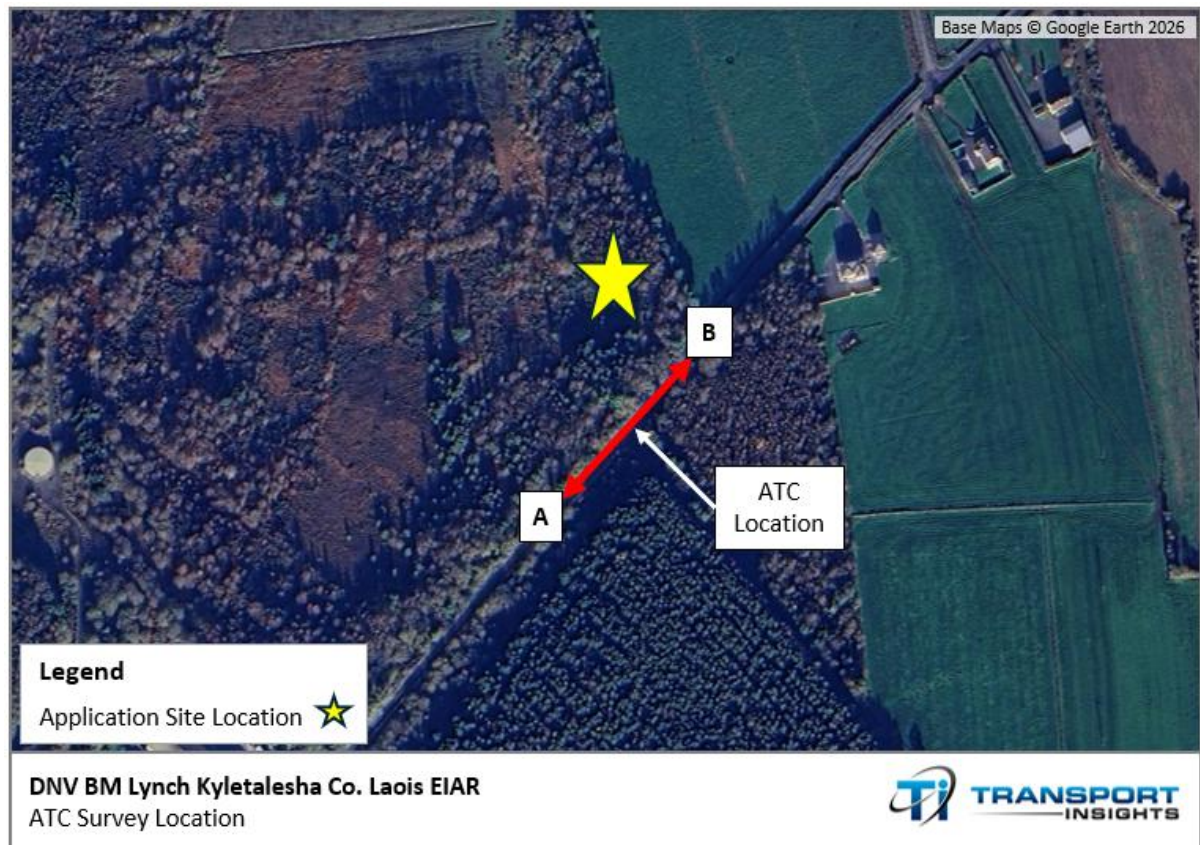


Figure 13.8: Junction Survey Arms

Full traffic survey data is included in Volume 3, Appendix 13-1 of this document. A summary of the survey results for the AM and PM peak hours and total survey period as ascertained from the survey data is presented in the following Table 13-2.

Table 13-2: JTC Survey Results Summary (Approach Flows)

Time Period/Direction	From	Northbound	Southbound
AM Peak (08:00-09:00hrs)	LV	40	39
	HV	3	1
PM Peak (17:00-18:00hrs)	LV	47	34
	HV	1	0
24-Hour (00:00-23:59hrs)	LV	408	416
	HV	26	19

Based on the results of the traffic surveys set out in the preceding Table 13-2, the local road network peak hours, in terms of maximum flow were identified to be 08:00-09:00hrs (AM Peak), and 17:00-18:00hrs (PM Peak).

The results of the traffic survey have been used to establish a baseline from which to predict traffic volumes on the local road network for the proposed development's assumed YoO and YoO +5.

13.3.4.4 Annual Average Daily Traffic (AADT)

In order to further understand the existing traffic flows on the local road network and establish a baseline to assess the traffic impact of the development proposals, it is first necessary to establish future levels of background traffic.

The survey data summarised in preceding sections was expanded in accordance with TII's Project Appraisal Guidelines for National Roads Unit 16.1 – Expansion Factors for Short Period Traffic Counts – PE-PAG-02039 (October 2016), to derive Annual Average Daily Traffic (AADT) on the local road network.

The following Table 13-3 outlines the expansion factors used in expanding the survey data to AADT using data for the Midlands (Laois County) Region.

Table 13-3: 24-hour, WADT and AADT factors – Midlands (Laois County)

Variable	Day of Week	Month of Year
Data Recorded	Tuesday	January
Factor	1 (WADT factor)	1.16 (AADT factor)

Based on the recorded traffic flows, weekly average daily traffic (WADT) and AADT have been calculated using the factors in Table 13-3 above. AADT data for roads in the vicinity of the site are presented in the following Table 13-4.

Table 13-4: AADT Traffic Data

Road Link	AADT		
	Total Vehicles	Of which Heavy Vehicles	% HGV
L2117	1,008	52	5%

The data set out in Table 13-4 above is used in Section 13.5 as a baseline in order to assess the impact of the proposed development under the different prescribed scenarios.

13.4 Characteristics of the Proposed Development

13.4.1 Site Access

The proposed development will involve the creation of a new access point to the site, located ca. 80 metres north of the existing field gate access point. The proposed site access is via the local access lane. It is proposed that the local access lane will be widened for a length of 33m from the junction with the public road. This will result in the local access lane widening from 3.1m to 6.5m.

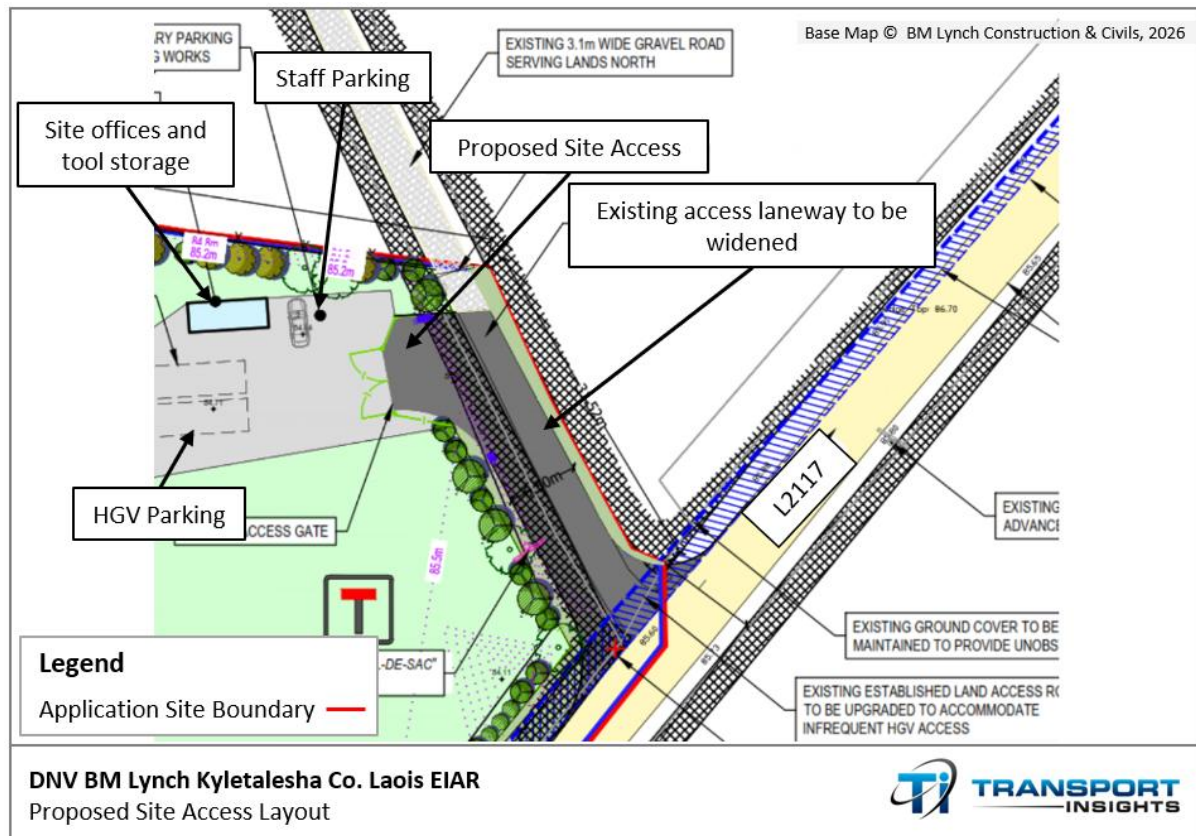


Figure 13.9: Proposed Site Access

13.4.2 Proposed Site Layout

The Proposed Development comprises the importation of material to in-fill and re-contour the site, which represents the operational stage of the Proposed Development. It comprises the importation of excavated inert soil and stone arising from local greenfield residential development sites in Portlaoise. The applicant proposes, subject to the grant of permission, to import inert soil and stone (by-product) to remediate approximately 2.52 hectares of the total site. On completion, the lands will be recontoured to a maximum finished height of 2.6 metres with an average infill depth of 1.9 metres. All finished ground levels will remain below the adjoining Local Primary Road L-2117. The development is designed to facilitate the recovery of excavated soil from local greenfield residential development site and proposed creation of a site access via a local access laneway (not in charge) that joins with the County Primary Road L-2117 at the south-eastern frontage. A temporary construction compound is planned at the entrance on the site at the southeastern frontage. This will contain:

- A temporary modular building to be used for site offices, the monitoring of incoming vehicles and welfare facilities;
- Parking for staff, visitors and construction vehicles;
- Storage for tools and small parts; and
- Wheel wash and fuelling facilities.



13.5.1 Construction Phase

- Site clearance of the entire area including the creation of a new site access,
- The partial removal of the boundary hedge on the northern and eastern sides of the site as necessary to facilitate sightlines and access
- Widening of the local access lane to 6.1 metres wide for a length of 33m between the proposed site access and the L2117
- Establishment of the construction compound of approximately 11.5 m², on the southeastern boundary of the site including. The compound will be used for site offices, monitoring of incoming vehicles, welfare facilities, parking for construction staff and visitors, HGV parking, secure storage for tools, a small reception area, wheel washing station and a fuelling point or mobile fuel bowser.

13.5.2.1 Assessment Scenarios and Years

The expected duration of the operational phase is 5 no. years with the construction compound continuing to be used during this period. The potential traffic impact of the proposed

development is assessed by reference to the number of vehicle trips that it is envisaged to generate, and for the purposes of this assessment, two separate scenarios will be analysed and their impacts reported. These scenarios are as follows;

- The **Do-Nothing scenario** traffic on the surrounding road network factored up to reflect forecast background growth over time.
- The **Do-Something scenario** builds on the Do-Nothing scenario and includes the assessment of expected development related traffic on the surrounding road network. This is considered a reasonable 'worst case' scenario.

These scenarios will detail the traffic impacts for the following years:

- YoO (2027); and
- YoO + 5 (2032);

Background traffic is factored up as per TII's Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections - PE-PAG-02017 (October 2021) central growth factors for Co. Laois. These factors are set out in the following Table 13-5.

Table 13-5 - Annual traffic growth factors – Laois

Central Growth Rates					
2016-2030		2030-2040		2040-2050	
LV	HV	LV	HV	LV	HV
1.0147	1.0280	1.0047	1.0125	1.0036	1.0155

13.5.2.2 Operational Period

During the operational period, a maximum of 2 no. staff are expected to be present on site at any one time. This will be a sporadic occurrence for grading and levelling of deposited material. The primary vehicle movements will be HGVs delivering infill material, with core work hours as follows;

- 08:00hrs to 17:00hrs – Monday to Friday
- 09:00hrs to 13:00hrs – Saturday.

13.5.2.3 Development Traffic Generation

The proposed development is expected to generate limited LV movements. Staff is occasionally expected on site to grade and level deposited material. This will be a sporadic occurrence but is anticipated to generate 2 no. LVs maximum at any one time.

Regarding HV movements, the infilling site is expected to be operational for 5 years with a total of 85,000 tonnes of infilling material being transported to the site during that period. This equates to ca.17,000 tonnes per year and 354 tonnes per week. The HGVs used for the site have a payload of ca. 15.5 tonnes. Therefore, the proposed development is expected to generate 4 no. two-way HGV movements per operational day.

The expected operational vehicle movements at the subject site are outlined in the following Table 13-6 (overleaf).

Table 13-6 Proposed Development Traffic

	Two-way Flow	One-way Flow
Staff (LVs)	2	4
HV's	4	8
Total	4	8

13.5.2.4 Haulage Route

All heavy vehicles will access and egress the site via the proposed site access on the local access lane. Vehicles will then use the L2117 as a link to the N80 national road, ca. 1.1km southwest of the site. The haulage route is illustrated in Figure 13.11.

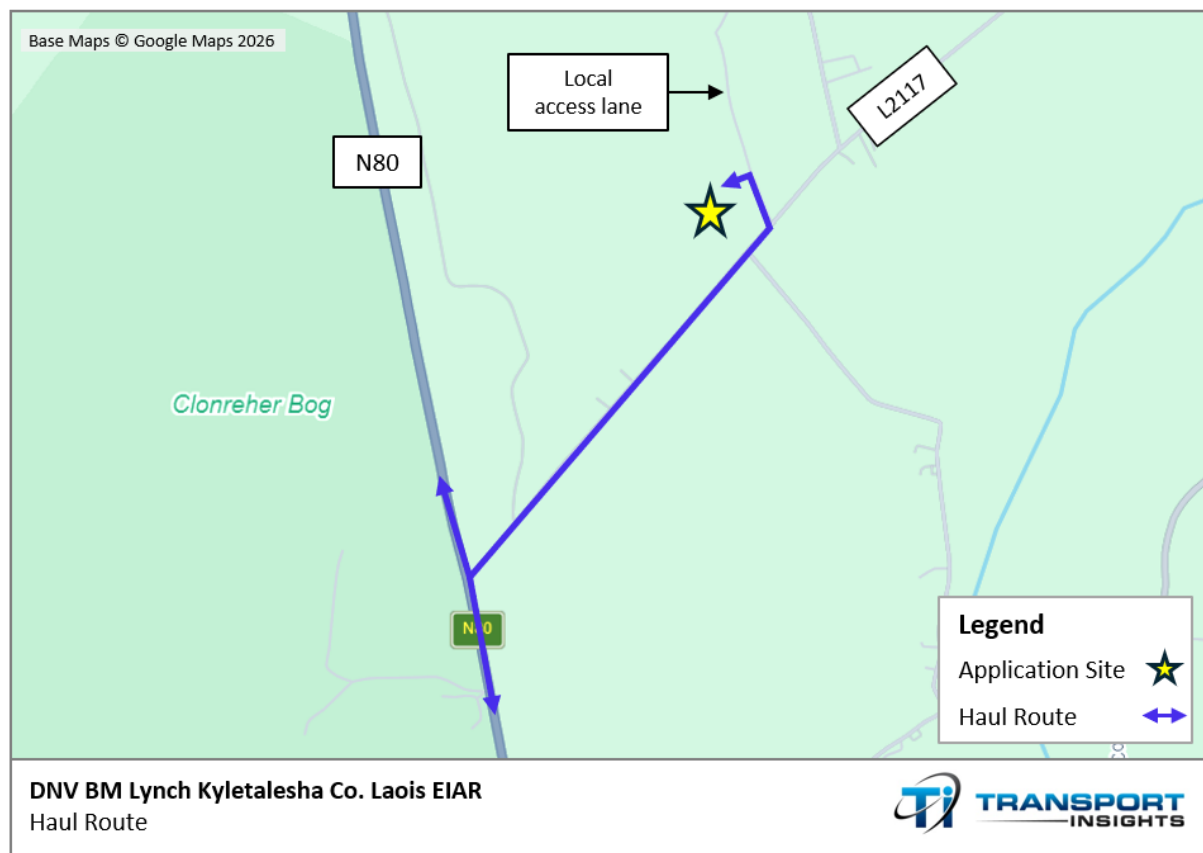


Figure 13.11: - Haulage Routes

13.5.2.5 Do-Something Traffic Forecast

Table 13-7 (overleaf) details the total AADT and proportion of which comprises HVs on L2117 for the Do-Something scenario. The Do-Something scenario considered a reasonable worst case scenario, whereby the proposed development traffic outlined in Section 13.5.2.3 are assessed in addition to the factored up background traffic for the year of opening (2027) and year of opening + 5 years (2032).

Table 13-7 – Do-Something Scenario Forecast Traffic Volumes on L2117

Year	Total AADT	Of which, HV	%HV	% AADT Increase over Do-Nothing Scenario within Table 13-8
2027	1,036	62	6%	1%
2032	1,095	62	6%	1%

The figures set out in Table 13-7 above show that within the Do-Something scenario, traffic volumes on the L2117 in the development's assumed year of opening (2027) are expected to increase. The percentage impact of the proposed development is 1% which under the EPA (May 2022) *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*, would be considered as medium-term in duration, with effects on the receiving environment not significant.

Section 2.1 of TII's Traffic and Transport Assessment Guidelines (May 2014) sets out thresholds for production of a Traffic and Transport Assessment, with thresholds for developments provided in Table 2.1. It is noted from Table 2.1 that where "traffic to and from the development exceeds 10% of the traffic flow on the adjoining road", more detailed analysis of a proposed development's traffic impacts may be required. The proposed development will result in a maximum <1% increase on the L2117 in year 2032, below the 10% threshold.

13.5.3 Potential Cumulative Impacts

13.5.4 Do Nothing Impact

The Do-Nothing impacts are based on the appropriately factored up background traffic. In this scenario, the site remains in its current state and thus generates no additional traffic.

Table 13-8 below details the total AADT and proportion of which comprises HVs on the L2117 in the Do-Nothing scenario for the year of opening (2027) and year of opening + 5 Years (2032).

Table 13-8 – Do-Nothing Scenario Forecast Traffic Volumes on L2117

Year	Total AADT	Of which, HV	%HV
2027	1,024	54	5%
2032	1,083	60	6%

Table 13-8 above provides a baseline from which the proposed development's traffic impacts have been determined, with the outputs of that analysis presented in Table 13-7.

13.6 Avoidance, Remedial & Mitigation Measures

13.6.1 Construction Phase

The construction phase involves site clearing, widening of the local access lane and the establishment of a temporary construction compound with site facilities. The expected duration

of this phase is 5 no. days with minimal LV and HV movements per day. Potential adverse effects of construction will be managed by HGVs using the established haulage routes and the enforcement of mandatory wheel washing when exiting the site.

13.6.2 Operational Phase

As part of the operational phase, several mitigation measures are proposed, which are as follows;

- In order to minimise the potential impact on the local road network surfaces, road cleaning is proposed to be implemented on site during the operational phase to mitigate against material such as dust, earth, debris etc. from entering the local road network, as required. This is in addition to the continuation of wheel cleaning at the site exit.
- In order to mitigate against the undue impact of heavy vehicles on sensitive locations, vehicles will strictly adhere to the haul route that utilised regional and national roads only, as outlined in Section 13.5.2.4. These haul routes shall be strictly controlled by the client during the duration of the operational phase with all heavy vehicle operators employed being issued maps of sanctioned haul routes to and from the site and under strict instructions to follow these routes.

13.6.3 “Worst Case” Scenario

The worst-case scenario in terms of traffic and transportation, is the scenario in which operations at the proposed development site have the capacity to generate the greatest amount of traffic on the surrounding road network. To provide a robust basis for this assessment, the Do-Something scenario analysed above represents a reasonable worst-case scenario.

13.7 Residual Impacts

The predicated residual impact of the proposed development in terms of traffic and transportation is that there will be a marginal increase in HVs on the adjoining road network due to the operation of the proposed development. This additional traffic is considered as being medium-term in duration with effects on the receiving environment being not significant, in accordance with the EPA (May 2022) *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*.

13.8 Monitoring

13.8.1 Construction Phase

Compliance with haul routes to site will be monitored continuously during the construction phase with spot checks carried out to ensure that all heavy vehicles follow the haul routes prescribed.

13.8.2 Operational Phase

Compliance with haul routes to site will be monitored continuously during the operational phase with spot checks carried out to ensure that all heavy vehicles follow the haul routes

prescribed. Only pre-approved sources, authorised collection companies, sign up to agreed haulage routes as part of approval process.

13.9 Interactions

The analysis contained within this chapter interacts with the Noise Assessments contained within this EIAR. This is primarily due to the potential for an increase in HV traffic movements on the surrounding road network due to development.

13.10 Difficulties Encountered When Compiling

No difficulties were encountered when compiling this EIAR Chapter.

13.11 References

The EIAR Traffic and Transport Assessment has been prepared taking into account the following policy and technical guidance documents:

- The requirements of EU Directives and national legislation (primary and secondary) concerning Environmental Impact Assessment (especially having due regard to the revised provisions of Directive 2014/52/EU);
- EPA (2003) Advice Notes on Current Practice in the Preparation of Environmental Impact Statements;
- EPA (May 2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports;
- DHPCLG (August 2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment;
- DHPCLG (May 2017) Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems: Key Issues Consultation Paper;
- Laois County Development Plan 2021 - 2027
- Transport Infrastructure Ireland (TII) (May 2014) Traffic and Transport Assessment Guidelines;
- Transport Infrastructure Ireland (TII) (October 2016) Project Appraisal Guidelines for National Roads Unit 16.1 - Expansion Factors for Short Period Traffic Counts;
- Transport Infrastructure Ireland (TII) Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (October 2021); and
- Transport Infrastructure Ireland (TII) Rural Road Link Design Standards (May 2023).

14 MATERIAL ASSETS: WASTE AND UTILITIES

14.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of the Proposed Development on material assets including built services and waste.

14.1.1 Quality Assurance and Competency of Experts

This chapter was prepared by Mairéad Foran, Senior Environmental Consultant with DNV. Mairéad has a B.A. (Moderatorship) in Environmental Sciences from Trinity College Dublin, and an Advanced Diploma in Planning and Environmental Law from King's Inns College, Dublin. Mairéad has over 7 years professional experience as an Environmental Consultant, with experience working on a large number of EIARs and EIA Screening Reports for projects of a similar nature and scale to that of the Proposed Development.

This report was reviewed by Gráinne Ryan, Principal EIA Consultant at DNV. Gráinne is an Environmental Consultant with over 12 years' experience, specialising in EIAs for strategic infrastructure, renewable energy, residential, industrial and pharmaceutical projects. Gráinne has a B.A. in Geography, Planning and Environmental Policy, an MSc in Environmental Policy and a Post Graduate Diploma in Project Management.

This chapter has been approved by Catherine Keogan, Technical Director and EIA Lead at DNV. Catherine is an environmental consultant with 37 years' experience in consultancy, specialising in EIAs for large-scale residential, commercial developments, pharmaceutical, BESS and solar projects working closely with a range of developers, planning consultants and architects within the public and private sector. Catherine has a B.Sc. (Hons) in Analytical Science and a Post Graduate Diploma in Renewable Energy Technology Systems.

14.2 Study Methodology

14.2.1 Relevant Legislation and Guidance

The methodology adopted for the assessment takes cognisance of a wide range of relevant legislation, guidelines, codes of practice, and plans. All phases of the Proposed Development were considered in evaluating potential effects on Material Assets, Waste and Utilities within the study area. The assessment of likely impacts was carried out in accordance with the documents listed below, which collectively ensure compliance with statutory requirements and alignment with best practice across environmental, infrastructure, and utility domains.

Environmental Impact Assessment and Planning:

- Directive 2011/92/EU as amended by Directive 2014/52/EU
- European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018).
- Environmental Protection Agency (EPA) (2022) Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR);
- Section 3.2 of the Urban Development and Building Heights: Guidelines for Planning Authorities (2018); and
- Laois County Development Plan 2021-2027.

Waste Management and Circular Economy:

- EPA (2021) Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects;
- Waste Framework Directive (Directive 2008/98/EC) as amended by Directive (EU) 2018/851;
- European Union (Waste Directive) Regulations 2020 as amended, S.I. No. 323 of 2020;
- Waste Management Act 1996 (as amended);
- Waste Action Plan for a Circular Economy (2020–2025);
- The National Waste Management Plan for a Circular Economy 2024-2030; and

Water and Wastewater Infrastructure:

- Water Services Acts 2007 (as amended);
- Uisce Éireann Code of Practice for Water Infrastructure Connections and Developer Services Design and Construction Requirements for Self-Lay Developments July 2020 (Revision 2);
- Uisce Éireann Code of Practice for Wastewater Infrastructure (IW-CDS-5030-03);
- IS EN752, Drain and Sewer Systems Outside Buildings; and
- CIRIA Report c753 “The SuDS Manual” (2015).

Utilities and Energy Infrastructure:

- ESB Networks National Code of Practice for the Customer Interface Version 5 (2021); and
- ESB Networks Construction Standards for MV Substation Buildings (2019).

Definitions of key terms such as “Material Assets,” “Waste,” and “Utilities” are applied consistently throughout this chapter in accordance with the EPA EIAR Guidelines (2022). “Material Assets” refers to physical infrastructure and services including energy, water, wastewater, telecommunications, and waste management systems.

Material Assets is a factor whose meaning has evolved over time. In Directive 2011/92/EU, it included architectural and archaeological heritage. Directive 2014/52/EU now includes those heritage aspects under the factor of Cultural Heritage. Material Assets can now be taken to mean built services and infrastructure. Traffic is included because, in effect, traffic consumes roads infrastructure. Sealing of agricultural land and effects on mining or quarrying potential are considered under the factor of Land and Soils.

In this EIAR, the Material Assets: Waste and Utilities chapter specifically addresses built services and infrastructure including:

- Surface Water Drainage;
- Wastewater Drainage;
- Water Supply;
- Electrical Supply;
- Gas Supply;
- Telecommunications; and
- Waste.

Impacts on other aspects commonly associated with Material Assets, such as Traffic, Population and Human Health, Air and Climate, are assessed in the following chapters of this EIAR:

- Chapter 4: Population and Human Health;
- Chapter 8: Air Quality;
- Chapter 9: Climate; and
- Chapter 13: Traffic.

Impacts arising from land take and soil sealing, defined as the covering of soil with impervious surfaces such as buildings, roads, and paved areas, are considered under chapter 6: Land and Soils. These impacts include the loss of soil functions, reduced permeability, and changes to natural drainage and biodiversity. This approach aligns with EPA and European Environment Agency guidance on the treatment of land and soil in environmental assessments.

The scope of work undertaken for the impact assessment includes a desk-based study of waste management services and infrastructure within the defined study area, specifically Laois County Council's jurisdiction. The desk study involved collecting all the relevant data for the Proposed Development site and surrounding area including published information and details pertaining to the Proposed Development provided by the Applicant and design team.

This does not include original calculations of capacity and demand. Instead, it draws upon technical assessments and calculations presented in supporting engineering and waste reports prepared by qualified consultants. These include the Outline Construction Environmental Management Plan (OCEMP)(Lenztech, Dec 2023) and Resource Waste Management Plan (RWMP) (DNV, 2026), and other documents listed below. All assessments are consistent with the methodologies and standards outlined in the relevant guidelines and legislation referenced in this section.

Information on built assets in the vicinity of the site was assembled by the following means:

- ESB Networks Utility Maps;
- Uisce Éireann Utility Plans;
- Gas Networks Ireland Service plans;
- EIR E-Maps;
- Hydrological Risk Assessment (DNV, 2026);
- Resource and Waste Management Plan (DNV, 2026); and
- Outline Construction Environmental Management Plan (Lenztech, Dec 2023)

Each of the above reports was reviewed and referenced where relevant throughout this chapter.

14.2.2 Description and Assessment of Potential Impacts

Effects vary in quality from negative, to neutral or positive. The effects of impacts will vary in significance on the receiving environment. Effects will also vary in duration. The terminology and methodology used for assessing the 'impact' significance and the corresponding 'effect' throughout this chapter is as described in Chapter 1 of this EIAR.

Effects vary in quality from negative, to neutral or positive. The effects of impacts will vary in significance on the receiving environment. Effects will also vary in duration. The terminology and methodology used for assessing the 'impact' significance and the corresponding 'effect' throughout this chapter is as described in Table 14-1.

*Table 14-1 Terminology Used to Assess the Quality of Potential Impacts and Effects
(Source: EPA Guidance, 2022)*

Quality of Effect/Impacts	Definition
Negative	A change which reduces the quality of the environment.
Neutral	No effects or effects that are imperceptible, within the normal bounds of variation or within the margin of forecasting error.
Positive	A change that improves the quality of the environment.
Significance of Effects/Impacts	
Imperceptible	An effect capable of measurement but without significant consequences.
Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.
Duration of Effects/Impacts	Definition
Momentary	Effects lasting from seconds to minutes.
Brief	Effects lasting less than a day.
Temporary	Effects lasting one year or less.
Short-term	Effects lasting one to seven years.

14.2.3 Local and National Waste Action Plans

The National Waste Management Plan for a Circular Economy (NWMPCE) 2024 -2030, sets out the framework for the prevention and management of waste across Ireland. This document is a statutory document underpinned by national and EU waste legislation, and reflects the targets set out for construction and demolition (C&D) waste in the Waste Framework Directive (WFD). This Plan replaces the previous Regional Waste Management Plans, including the Eastern-Midlands Waste Management Plan 2015-2021, which covered County Laois.

The strategic vision of the Plan is to rethink the approach to managing waste, and to move towards a 'circular economy' approach where resources are reused or recycled as much as possible, and the overall generation of waste is minimised.

In order to achieve this vision, the Plan has set out a number of specific and measurable performance targets in relation to construction and demolition waste:

- Achieve a 2% reduction per annum is proposed for total construction and demolition waste to achieve a cumulative 12% reduction by 2030 (baseline is 9 million tonnes); and
- Achieve 70% C & D waste sent for reuse, recycling and other recovery of construction and demolition waste (excluding natural soils and stones and hazardous wastes).

The Plan aims to “prioritise waste prevention and circularity in the construction and demolition sector to reduce the resources that need to be captured as waste”. In order to achieve the objectives, set out in NWMPCE, it is imperative that robust resource and waste management plans are developed for and designed into the pre-construction, construction and operational phases of the Proposed Development.

For the purposes of this development, the objectives and targets set out in the NWMPCE are addressed through the RWMP (DNV, 2026) and OCEMP (Lenztech, Dec 2023), which outline measures to minimise waste generation and maximise reuse and recovery across all phases of the Proposed Development.

The RWMP (DNV, 2026) and OCEMP (Lenztech, Dec 2023), which support alignment with the NWMPCE, are submitted under separate cover as part of the planning application. These documents have been reviewed as part of this assessment and are referenced throughout this chapter where relevant.

14.2.4 Article 27 of the European Communities (Waste Directive) Regulations 2011

Under Article 27 of the European Communities (Waste Directive) Regulations 2011 (SI No. 126 of 2011) as amended (referred to hereafter as Article 27), uncontaminated soil and stone free from anthropogenic contamination which is excavated during the construction phase of a development can be considered a by-product and not a waste, if (a) further beneficial use of the material is certain, (b) it can be used directly without any further processing, (c) it is produced as an integral part of the development works and (d) the use is lawful and will not have any adverse environmental or human health impacts (EPA, 2019).

For Article 27 to apply, the beneficial use mentioned in point (a) above must be identified for the entirety of the excavated soil from the Proposed Development prior to its production, with that use taking place within a definite timeframe, for it to be regarded as certain.

14.3 The Existing and Receiving Environment (Baseline environment)

The Proposed Development comprises an elongated land parcel with a total area of 2.92 hectares, located at Kyletalesha, Portlaoise, County Laois, within the eastern extent of the Clonreher Bog peatland. Access to the Proposed Development site is gained from the south-east entrance via an existing gravel access road leading from the L2117 Local Primary Road. The lands comprising the Proposed Development site consist of cutover bog. Although the precise historical land-use is not documented, it is considered likely that limited, non-commercial peat extraction took place on the lands in the past.

The ground is wet in nature and is characterised by an overgrowth of self-seeded trees and ground vegetation that has established over time following the cessation of peat-related activity. The existing ground conditions currently render the lands unsuitable for agricultural use and pose risks to both farm machinery and livestock. The Proposed Development involves the recovery and beneficial reuse of a by-product generated from the construction sector. Upon completion, the recontoured landform is expected to provide an improvement on the current land condition.

14.3.1 Immediate Surroundings

The wider area has an extensive history of waste-related activity, including the former Portlaoise Landfill and a number of licensed waste and industrial facilities located within proximity to the Proposed Development site. However, there is no record of previous development or landfilling activity on the Proposed Development site itself.

14.3.2 Surface Water Drainage

There are no surface water features recorded on the EPA database (EPA, 2026) within the site boundary. However, during the site walkover undertaken by DNV, a number of field drains (i.e., drainage ditches) were identified throughout the site. The existing drainage ditches were observed to flow in a southerly direction (i.e., north to south). A drainage ditch present along the western boundary of the site, which will be retained as part of the Proposed Development, turns southeast where it appears to be culverted under the road. This ditch was observed to contain water permanently, whereas the other ditches contained water only during rainfall events.

There is no surface water drainage within the site of the Proposed Development.

14.3.3 Wastewater Drainage

There is no foul water drainage within the site of the Proposed Development.

No onsite wastewater treatment system or connection to the public mains is required. Effluent and waste from temporary onsite welfare facilities will be maintained, collected and tankered offsite by a licenced waste contractor.

14.3.4 Water Supply

As documented in the Planning Application form, there is no proposed source of drinking water supply for the duration of the Proposed Development. There will be no more than 1-2 people (i.e., delivery driver and plant operator) at the site at any one time. This falls below the Health and Safety Authority (HSA) threshold of 5 persons for full welfare provision. As such, a permanent drinking water supply is not required.

14.3.5 Electrical Supply

EirGrid develop and operate the national electricity grid and are responsible for taking electricity from the power generators and delivering it to the distribution network, which is operated by ESB Networks. The high-voltage Irish electricity transmission grid comprises 6,800 km of power lines and operates at 400 kV, 275kV, 220 kV and 110 kV. Substations provide entry points to, and exits from, the transmission grid.

There is no proposed electricity supply onsite, and a small generator may be needed infrequently for lights.

Portlaoise 110 kV Station lies approximately 5km south of the Proposed Development site.

14.3.6 Gas Supply

Gas Networks Ireland builds, develops and operates Ireland's gas infrastructure, maintaining over 14,521 km of gas pipelines and two sub-sea interconnectors. Gas Networks Ireland is responsible for connecting all new gas customers to the network, and for work on service pipes and meters at customers' premises, on behalf of all gas suppliers in Ireland.

According to the utilities map from GNI, there is a local medium-pressure gas distribution main running from Portlaoise to Portarlington, east of the Proposed Development site. It is not anticipated that any diversions of GNI's infrastructure will be required as part of these works

14.3.7 Telecommunications

In terms of mobile telecommunication for transmission and reception, there are a number of mobile masts located close to the site. To the west of the site is a cell operated by Three, and to the south of the site a cell operated by Eircom.

The Department of the Environment, Climate and Communications (DoECC) has published a High-Speed Broadband Map which identifies locations and premises based on the availability of high-speed broadband services. The site is located 2.8km southwest of a blue area where *"where commercial operators are delivering or have indicated plans to deliver high speed broadband services. Operators are continuing to enhance their services in these areas to improve access to high-speed broadband."* (DoECC, 2026).

14.3.8 Waste

The Proposed Development is located within Laois County Council (LCC) jurisdiction. LCC is the local authority responsible for setting and administering waste management activities in the area of the Proposed Development. The waste management policies, objectives, and actions for Laois, as outlined in the Laois County Development Plan 2021-2027 and the Laois County Council Waste Management (Storage, Presentation, Segregation and Collection of Household Waste) Bye-Laws 2009, emphasise sustainable practices crucial for infill developments. Key policies include to promote balanced economic development and employment ensuring a diverse range of economic sectors are developed and supported, to focus new residential development into brownfield sites and to promote circular economy principles and the incorporation of sustainable waste management measures within developments, in line with the "Best practice guidelines for the preparation of resource & waste management plans for construction & demolition projects" guidance.

14.4 Characteristics of the Proposed Development

A comprehensive description of the Proposed Development is presented in Chapter 2 of this EIAR.

The Proposed Development will be operated in accordance with the requirements of the planning grant conditions.

14.5 Potential Effect of the Proposed Development

14.5.1 Construction Phase

14.5.1.1 Surface Water Drainage

The new surface water drainage collection network will be provided at commencement (i.e., during the construction phase of the Proposed Development) with the installation of the Sustainable Drainage Systems (SuDS) measures. Any surface water discharge will be via the bypass separator (i.e., catchpit manholes) with an integrated silt collection chamber for disposal to ground onsite via a soakaway (i.e., an infiltration trench sized in accordance with BRE Digest 365 Soakaway Design). In addition, sumps of approximately 600mm depth, within manhole chambers will serve as silt traps to manage siltation with optional use of strainers within the pipe network and manholes during seasonal weather conditions in order to reduce the silting effects of these particles in the network. Runoff from areas of exposed soil will be intercepted by a silt containment barrier installed as good practice in advance of the drainage feature.

Uncontaminated surface runoff from the compound (TCC) will be directed to a swale or infiltration area constructed during the construction phase, to prevent discharge to the existing drainage ditch. The swale will be located at the perimeter of the compound area and will be a wet swale, with runoff infiltrating to ground (i.e., to the existing subsoil). All other runoff from the wider site will continue to follow existing natural drainage patterns and newly installed drainage routes as established above.

As documented in the HRA (DNV, 2026a; refer to Volume 3 Appendix 7.1 of the EIAR), during the construction phase, there will be no direct discharges to or abstractions from groundwater at the Proposed Development. It is anticipated that there will be no requirement for dewatering at the site. The potential effects would be neutral and temporary and are considered non-significant in the context of the EIA Directive. Chapter 7 (Hydrology and Hydrogeology) of this EIAR has assessed the potential effects on surface water in further detail.

14.5.1.2 Wastewater Drainage

As documented in the Planning Application form, there will be no more than 1-2 people (i.e., delivery driver and plant operator) at the site at any one time.

As documented in the OCEMP (Lenztech, 2023), a combination of a temporary portaloo and an onsite welfare facility cabin with self-contained toilet and washing facilities will be provided for site personnel. No onsite wastewater treatment system or connection to the public mains is required. Effluent and waste from temporary onsite welfare facilities will be maintained, collected and tankered offsite by a licenced waste contractor.

There will be no foul discharge from the site or foul water connection to the live sewers during the construction phase of the Proposed Development. Welfare facilities will comply with the

Health and Safety Authority (HSA) Requirements for Construction Site Welfare Facilities (2017). Facilities will include mobile toilets and/or self-contained welfare cabins with sealed waste storage, with all sewage waste collected and tankered offsite by a licensed waste contractor in accordance with all relevant waste management legislation. It is considered that any impact relating to foul drainage during the construction phase will be neutral and temporary and is considered non-significant in the context of the EIA Directive

14.5.1.3 Water Supply

As documented in the Planning Application form, there is no proposed source of drinking water supply for the duration of the Proposed Development. There will be no more than 1-2 people (i.e., delivery driver and plant operator) at the site at any one time. This falls below the Health and Safety Authority (HSA) threshold of 5 persons for full welfare provision. As such, a permanent drinking water supply is not required, and proportionate welfare arrangements are acceptable for this scale of activity.

It is considered that any impact relating to water supply during the construction phase will be neutral and temporary, and is considered non-significant in the context of the EIA Directive

14.5.1.4 Electricity Supply

There is no proposed electricity supply onsite, and a small generator may be needed infrequently for lights during the construction phase. The potential effect from the construction phase of the Proposed Development on the local electrical supply network is likely to be neutral, imperceptible and temporary, and is non-significant in the context of the EIA Directive.

14.5.1.5 Gas Supply

It is not anticipated that there will be a requirement for gas connection during the construction phase. It is considered that any impact relating to gas supply during the construction phase will be neutral and temporary, and is considered non-significant in the context of the EIA Directive

14.5.1.6 Telecommunications

It is not anticipated that there will be a requirement for a telecommunications connection during the construction phase. It is considered that any impact relating to telecommunications during the construction phase will be neutral and temporary, and is considered non-significant in the context of the EIA Directive

14.5.1.7 Waste

An RWMP has been prepared for the Proposed Development (DNV, 2026). The RWMP outlines the waste management practices that will be undertaken at the site. The Proposed Development will comprise of the importation of excavated inert soil to an existing low lying parcel of land. The site which is 2.59ha in size is to be developable for infilling with imported soil over a 5-year (maximum) period. The construction of the Proposed Development includes site clearance, site fencing (temporary & permanent), establishment of buffer strips to adjoining lands, the formation of site access including road widening works, and protection of existing site drainage and the establishment of the construction compound.

Construction and Demolition (C&D) type materials will be generated in very small amounts due to the nature of the construction phase of the Proposed Development. Until final materials and detailed construction methodologies have been confirmed, it is difficult to predict with a high level of accuracy the construction waste that will be generated from the proposed works as the exact materials and quantities may be subject to some degree of change and variation during the construction process.

It is anticipated that there will be no asbestos containing materials (ACMs) generated during the construction phase of the Proposed Development. However, in the event that ACMs are found at any stage during the construction phase, the Client will be notified, and a suitable management plan will be implemented for the safe removal and disposal.

Where required, the waste classification of ACMs will be based on an assessment by an appropriately qualified asbestos specialist.

Additionally, there is also a potential of encountering contaminated material arising from accidental spills (e.g., fuel or hydraulic fluid). In the event that contaminated material is encountered during excavation, its management will be undertaken in accordance with the procedures outlined in the Land and Soils chapter and the OCEMP prepared by Lenztech (Dec 2023). The Contractor would be required to prepare an Environmental Incident Response Plan which would provide emergency response contacts, reporting procedures, and procedures for dealing with all potential pollution incidents during the construction of the Proposed Development. Should potential contaminated materials be encountered on the origin sites, a Waste Assessment Criteria (WAC) testing and subsequent waste classification will be completed in order to select an appropriate receiving facility for the waste. It is noted that natural soils showing no visual signs of impact may, in certain circumstances, be classified without testing.

In addition to these measures, the potential for ecological impacts arising from the disturbance, handling, or disposal of such material has been assessed in the Biodiversity chapter and the AA Screening Report (Roger Goodwillie & Associates, June 2023). These documents confirm that, with the implementation of appropriate mitigation measures, including water quality protection, dust and noise control, and timing restrictions, there will be no adverse effects on nearby European sites. The interaction between waste management and ecological protection is further detailed in the Interactions section of this chapter.

Additional construction waste may include surplus building materials, such as timber off-cuts, broken concrete blocks, cladding, plastics, metals and tiles generated. There may also be excess concrete during construction which will need to be disposed of. Plastic and cardboard waste from packaging and supply of materials will also be generated. The contractor will be required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

Waste will also be generated from construction workers e.g. organic / food waste, dry mixed recyclables (wastepaper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and potentially sewage sludge from temporary welfare facilities provided on site during the construction phase. All waste, including food waste, will be stored in wheelie bins on site and it will be collected by an appropriately authorised waste collector.

All waste will be segregated on site where practical, with off-site segregation carried out where necessary. Waste contractors will be required to hold valid collection permits, and receiving facilities must be appropriately licensed or permitted. Waste tracking logs will be maintained by the appointed Resource Manager (RM), including collection permits, facility licences, and receipts from receiving facilities.

The potential effect from the construction phase on waste recovery and disposal will be neutral, slight and temporary and is considered non-significant in the context of the EIA Directive.

14.5.2 Operational Phase

14.5.2.1 Surface Water Drainage

There will be no direct discharges to or abstractions from groundwater during the operational phase of the Proposed Development.

No new drainage infrastructure is proposed during the operational phase, as surface water runoff will be managed in accordance with the drainage infrastructure constructed during the construction phase (i.e., SuDS). The infilling and recontouring will permanently modify the existing local topography and the existing drainage patterns (i.e., direction) and the distribution of surface water runoff across the site. However, the implementation of SuDs for the Proposed Development will allow surface water to infiltrate to ground (though infiltration capacity is limited) via a soakaway, retaining surface water runoff and therefore, reducing the level of runoff discharging to the onsite ditches.

Additionally, there is no identified risk of flooding at the site, which is not located within Flood Zone A or B. Furthermore, it is considered that there will be little to no change to the overall surface water patterns and therefore, it is considered that there will be a 'negative to neutral', 'imperceptible' and 'permanent' effect on the hydrological flow regime and is considered non-significant in the context of the EIA Directive.

During the construction phase of the Proposed Development, there is a potential for the release of suspended sediments entrained in surface water runoff during the infilling and recontouring at the site, with the potential to mobilise fine sediments towards drainage features, which will be upgraded and maintained as filter drains, as part of the construction phase, to maintain existing drainage flows. Surface water runoff will be contained, attenuated and treated onsite prior to discharge to ground via soakaway and there will be no discharges to any onsite ditches. However, in the absence of mitigation measures, this may result in a 'negative', 'slight to moderate' and 'temporary to short-term' impact on the quality of the drainage ditches present at the site. It is noted that this impact is considered non-significant in the context of the EIA Directive, due to its limited spatial extent, short duration, and the implementation of standard construction mitigation measures.

The importation and infilling of the site with Article 27 soil and stone (by-product) certified as clean, inert and suitable for reuse, for restoration purposes will be subject to strict control procedures in accordance with EPA guidelines. Therefore, there will be no potential impacts on the quality of the receiving water environment associated with the importation of soils.

There will be no storage or handling of deleterious materials during the operational phase and refuelling or fuel-powered equipment will be managed in the same controlled manner as during construction. As such, the potential impact arising from accidental releases of hazardous

materials remains the same as that assessed for the construction phase. In the absence of mitigation, such an event could result in a 'negative', 'significant' and 'medium-term' impact on local groundwater or surface water quality and would be considered significant in the context of the EIA Directive. However, standard controls will be in place to prevent this unlikely scenario.

14.5.2.2 Wastewater Drainage

There will be no foul discharge from the site during the operational phase, as foul effluent will continue to be contained and tankered offsite in the same manner as during construction. Accordingly, the impact during the operational phase is the same as for the construction phase and is assessed as 'neutral', 'imperceptible' and 'temporary' and is considered non-significant in the context of the EIA Directive.

14.5.2.3 Water Supply

Potable water will be provided in the form of bottled water for drinking and messing purposes, while welfare units are likely to incorporate built-in water bowzers for sanitation. The operational phase will have a neutral, imperceptible, short-term effect and is considered non-significant in the context of the EIA Directive.

14.5.2.4 Electricity Supply

Electricity from the national grid will be required to provide public lighting and power supply for the Proposed Development. It is proposed that a small generator may be needed infrequently for lights. The potential effect from the operational phase on the electricity supply network is likely to be neutral, imperceptible, and short-term and is considered non-significant in the context of the EIA Directive.

14.5.2.5 Gas Supply

There is no gas supply proposed. The potential effect from the operational phase on the gas supply network is likely to be neutral, imperceptible, and short-term and is considered non-significant in the context of the EIA Directive.

14.5.2.6 Telecommunications

The operational phase will have a minimal increase in demand on the local telecommunications network. The site is located within an area where high speed broadband is available and there are mobile masts in proximity to the site. The potential effect from the operational phase on the telecommunications network is likely to be neutral, imperceptible, and short-term and is considered non-significant in the context of the EIA Directive.

14.5.2.7 Waste

All wastes generated during this phase will be segregated where possible and sent for recycling, recovery, or disposal to a suitably licensed or permitted waste facility. Given the limited scale of site clearance activities, the volume of waste generated is expected to be low, and it is not considered that this will place any burden on local waste management infrastructure.

Waste management during this phase will be carried out in accordance with the relevant provisions of the Waste Management Act 1996 (as amended). the Proposed Development is not expected to result in any significant impacts on local waste infrastructure or services

During the operational phase, a small quantity of non-hazardous waste will be generated by the proposed site operations. Food waste will be stored in wheelie bins on site, and it will be collected by an appropriately authorised waste collector. All wastes generated on site will be sent for recycling, recovery, or disposal to a suitably licensed or permitted waste facility. As the quantity of waste that will be generated is small in scale, it is not considered that there will be any impact on waste management in the area.

All wastes generated will be sent for recycling, recovery, or disposal at a suitably licensed or permitted waste facility. Given the limited scale of waste generation and the continuation of existing management practices, the Proposed Development is not expected to result in any significant impacts on local waste infrastructure or services.

The potential effect from the operational phase on waste disposal is likely to be neutral, imperceptible, and short-term and is considered non-significant in the context of the EIA Directive.

14.5.3 Potential Cumulative Impacts

The EC *Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions*, defines cumulative effects as “*effects that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project*”. Effects which are caused by the interaction of effects, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the accumulation of different effects that are individually minor.

The projects considered for potential cumulative developments are detailed in Chapter 2 (Description of the Proposed Development) of this EIAR.

It is considered that there is no potential for the Proposed Development to act in-combination with other permitted developments in the vicinity that could cause likely significant effects on;

- Surface/storm water drainage;
- Wastewater drainage;
- Water supply;
- Electrical supply;
- Gas supply;
- Telecommunications; and
- Waste.

The limited scale of the proposed construction works, and the absence of new utility demands or discharges support the conclusion that no significant cumulative effects will arise from the Proposed Development.

It is concluded that there are no other potentially significant cumulative effects on material assets arising from the Proposed Development in combination with the identified existing and permitted off-site developments, as described in Chapter 2 of this EIAR.

14.5.4 “Do Nothing” Effect

In the ‘Do Nothing’ scenario, the Proposed Development does not proceed, and the site will remain as overgrown, uncultivated cutover bog. No additional infrastructure or waste

management requirements would arise, and there would be no change to the existing impact on local waste services or infrastructure.

14.6 Avoidance, Remedial and Mitigation Measures

As the use of material assets for the Proposed Development is considered to be minimal, no specific avoidance, remedial or mitigation measures are required in relation to utilities such as water supply, wastewater drainage, electrical supply, telecommunications, or gas.

However, to ensure proper management of waste and alignment with national policy objectives, the following waste-related mitigation measures will be implemented:

- Segregation of waste at source to facilitate reuse and recycling where feasible;
- Storage of waste in designated containers (e.g. wheelie bins) to prevent littering or environmental contamination;
- Regular collection of waste by authorised waste contractors; and
- Compliance with relevant legislation, including the Waste Management Act 1996 (as amended) and associated regulations.

In addition, site management practices and environmental protection measures relevant to surface water, groundwater, noise, dust, and biodiversity have been detailed in other chapters of this EIAR. These measures will ensure that the Proposed Development does not result in significant impacts on the surrounding environment or sensitive receptors.

14.6.1 “Worst Case” Scenario

In a worst-case scenario, where waste segregation practices are not fully adhered to or where delays occur in the collection of waste by authorised contractors, a temporary increase in on-site waste storage could arise. This may lead to minor nuisance effects such as littering, odour, or the attraction of pests, particularly in relation to food waste.

However, given the limited scale of waste generation, and the requirement to comply with the Waste Management Act 1996 (as amended), the likelihood of such effects is low. These potential impacts are readily mitigated through routine site management measures, and will ensure that even under worst-case conditions, no significant environmental effects are anticipated.

14.7 Residual Effects

Following the implementation of standard waste management practices, including segregation, use of enclosed bins, and regular servicing by authorised contractors, no significant residual effects are anticipated in relation to waste or material assets. The Proposed Development will utilise existing utilities and infrastructure, and the scale of waste generation will remain low. As such, the Proposed Development is not expected to result in any long-term or cumulative impacts on the receiving environment.

14.8 Monitoring

It is proposed that an environmental monitoring programme will be developed and implemented for the operational lifetime of the Proposed Development. The monitoring programme will verify (i) that implemented controls prevent and minimise emissions from the Proposed Development and (ii) that there is no negative impact on the receiving environment via uncontrolled releases of pollutants, sediment, dust, noise or vibration. Monitoring will also

assess the effects of the activities on the environment so that operational changes and improvements can be made where appropriate. The monitoring programme and sampling frequency will be agreed with Laois County Council.

14.9 Interactions

14.9.1 Population and Human Health

Proper waste management and the use of enclosed bins will prevent nuisance effects such as odour or littering, thereby protecting the health and amenity of site workers and any nearby residents. The continuation of existing utilities and infrastructure ensures no disruption to local services. Chapter 4 Population and Human Health of this EIAR has concluded that no long-term, adverse effects are likely to impact on Population and Human Health as a result of the Proposed Development.

14.9.2 Land and Soil

Where possible, it is intended to retain and reuse the limited excavated topsoil and subsoil on the site during the construction phase of the Proposed Development. However, where required, unsuitable soil and subsoil will be removed offsite in accordance with all statutory legislation. Potential impacts on land and soil are addressed in Chapter 6 of this EIAR.

14.9.3 Hydrology and Hydrogeology

Waste will be managed in a manner that prevents any risk of leachate or runoff, ensuring protection of surface and groundwater quality. Potential impacts on water and hydrology are addressed in Chapter 7 of this EIAR.

14.9.4 Climate

The use of existing utilities and infrastructure minimises the carbon footprint associated with construction and operational activities. Waste will be collected by authorised contractors, and no significant greenhouse gas emissions are expected from waste handling. Potential impacts on climate are addressed in Chapter 9 of the EIAR.

14.9.5 Traffic

The Proposed Development is expected to generate 4 no. two-way HGV movements per operational day, with a not significant overall impact on the environment. Potential impacts on traffic are addressed in Chapter 13 of this EIAR.

14.10 Difficulties Encountered When Compiling

No difficulties were encountered in the preparation of this chapter.

14.11 Conclusion

The assessment of likely effects resulting from the Proposed Development on built services and waste in this chapter has identified the existing infrastructure in the surrounding area in relation to surface water, wastewater, water supply, electrical supply, gas supply, telecommunications and waste. Where relevant, appropriate mitigation and monitoring measures have been detailed.

Given the limited scale of waste generation during the construction phase, and the nature of the operational phase of the Proposed Development, no significant impacts on local waste infrastructure or services are anticipated, either individually or cumulatively.

There is no additional increase in demand to utilities such as water supply or electrical supply are part of the Proposed Development. Accordingly, the site is considered suitable for development as proposed.

14.12 References

Environmental Protection Agency (EPA) (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.

EPA (2021) Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects.

EPA (2002) Guidelines on the information to be contained in Environmental Impact Statements.

ESB Networks (2021) National Code of Practice for the Customer Interface Version 5.

ESB Networks (2019) Construction Standards for MV Substation Buildings.

European Union (Waste Directive) Regulations 2011-2021.

Health and Safety Authority (2010) Code of Practice for Avoiding Danger from Underground Services.

Irish Water Code of Practice for Water Infrastructure Connections and Developer Services Design and Construction Requirements for Self-Lay Developments July 2020 (Revision 2).

Laois County Development Plan 2021-2027

Litter Pollution Act 1997 as amended.

Local Government Ireland (2024) The National Waste Management Plan for a Circular Economy 2024-2030.

Outline Construction Environmental Management Plan (Lenztech, 2023)

Resource Waste Management Plan (DNV, 2026)

Waste Framework Directive (Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste) as amended by Directive (EU) 2018/851.

Waste Management Acts 1996 to 2011.

Water Services Acts 2007 to 2017.

15 RISK MANAGEMENT

15.1 Introduction

This chapter sets out the assessment of the vulnerability of the Proposed Development to risks of major accidents and/or disasters. It assesses the expected effects on the environment of the Proposed Development due to the potential risk of major accidents and disasters, and the Proposed Developments vulnerability to same, including the methodology used for the assessment. The interactions and mitigation and monitoring measures are included in Chapters 16 and 17, respectively.

15.1.1 Quality Assurance and Competency of Experts

This chapter was prepared by Aisling Jones, Environmental Consultant at DNV. Aisling has a Bachelor of Civil Law degree from University College Dublin and a Master of Science degree in Environmental and Climate Law also from University College Dublin. Lakshmi has worked as an Environmental Consultant with DNV since 2025 and has experience preparing Environmental Impact Assessment (EIA) Screening Reports, Construction Environmental Management Plans (CEMP), Waste, Interactions and Mitigation and Monitoring chapters for EIARs.

This chapter was reviewed by Grainne Ryan, Principal EIA Consultant at DNV. Gráinne is a Principle Environmental Consultant with 12 years' experience, specialising in EIAs for strategic infrastructure, renewable energy, residential, industrial and pharmaceutical projects. Gráinne has a B.A. in Geography, Planning and Environmental Policy, an MSc in Environmental Policy and a Post Graduate Diploma in Project Management.

This chapter has been approved by Catherine Keogan, Technical Director and EIA Lead at DNV. Catherine is an environmental consultant with 37 years' experience in consultancy, specialising in EIAs for large-scale residential, commercial developments, pharmaceutical, BESS and solar projects working closely with a range of developers, planning consultants and architects within the public and private sector. Catherine has a B.Sc. (Hons) in Analytical Science and a Post Graduate Diploma in Renewable Energy Technology Systems.

15.2 Study Methodology

15.2.1 Scope and Context

The relevant legislation that applies to this chapter is the Planning and Development Regulations 2001 as amended, and in particular Schedule 6 – Information to be contained in EIAR. The following paragraph of Schedule 6, Paragraph 2(e)(i)(IV), specifically refers to "*a description of the likely significant effects on the environment of the proposed development resulting from ... the risks to human health, cultural heritage or the environment (for example due to accidents or disasters)*".

Paragraph 2(h) further expands with "*a description of the expected significant adverse effects on the environment of the proposed development deriving from its vulnerability to risks of major accidents and/or disasters which are relevant to it. Relevant information available and*

obtained through risk assessments pursuant to European Union legislation such as the Seveso III Directive or the Nuclear Safety Directive or relevant assessments carried out pursuant to national legislation may be used for this purpose, provided that the requirements of the Environmental Impact Assessment Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for, and proposed response to, emergencies arising from such events."

Additionally, the Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) (the "COMAH Regulations"), which implement the Seveso III Directive (2012/18/EU), and which revoked the 2006 Major Accident Regulations also applies to this chapter.

Further relevant legislation includes:

- The Safety, Health and Welfare at Work Act 2005, which outlines the responsibilities of employers and others to ensure the health and safety of persons at work, including risk assessments and emergency preparedness; and
- The Floods Directive (2007/60/EC), which establishes a framework for flood risk assessment and management, aiming to reduce adverse impacts on human health, the environment, cultural heritage, and economic activity.

15.2.2 Guidelines and Reference Material

Cognisance has been taken of the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA 2022). This document follows the requirements laid out in the Directive 2014/52/EU.

Specifically, the EPA Guidelines state that the EIAR must take account of:

"...the vulnerability of the project to risk of major accidents and /or disasters relevant to the project concerned and that the EIAR therefore explicitly addresses this issue. The extent to which the effects of major accidents and / or disasters are examined in the EIAR should be guided by an assessment of the likelihood of their occurrence (risk)... The potential for a project to cause risks to human health, cultural heritage or the environment due to its vulnerability to external accidents or disasters is considered where such risks are significant, e.g., the potential effects of floods on sites with sensitive plants. Where such risks are significant then the specific assessment of those risks in the form of a Seveso Assessment (where relevant) or Flood Risk Assessment may be required. The EIAR should refer to those separate assessments while avoiding duplication of their contents."

Reference has also been made to the *Guide to Risk Assessment in Major Emergency Management* (Department of the Environment, Heritage and Local Government (DoEHLG) Publication 2010) and the *National Risk Assessment for Ireland* (Office of Emergency Planning, Department of Defence (DOD), 2020).

To ensure consideration of most-up-to-date strategic and emerging risks, reference has also been made to the *National Risk Assessment 2023*, *National Risk Assessment 2024 – Overview of Strategic Risks*, and the EPA's *National Climate Change Risk Assessment* (2025). These reports identify Ireland's most pressing and emerging risks across civil, environmental, geopolitical, technological, and economic domains.

A consolidated list of national hazards, drawing on these documents, is presented in Table 15-1.

Table 15-1 Consolidated List of National Hazards (Sources: Department of Defence (2020); National Risk Assessments (2023 and 2024) and EPA National Climate Change Risk Assessment (2025).

Hazard: Civil	Hazard: Natural/Environmental
• Large Crowd Event • Pandemic (including zoonotic Diseases, AMR) • Water Supply Distribution and Contamination • Food Chain Contamination • Animal Disease • Terrorist Incident (including hybrid/Cyber-CBRN threats) • Social Cohesion and Civil Unrest • Migration and Integration Pressures • Misinformation/Disinformation Impacting Public Response	• Storm • Snow and Ice (including prolonged low temperature) • Flooding (including pluvial, fluvial and coastal) • Coastal Erosion • Extreme Heat Events (and associated health impacts) • Biodiversity Loss • Climate Change (cumulative risk category) • Wildfires (emerging)
Hazard: Transportation	Hazard: Technological
• Maritime Incident • Air Incident • Disruption at Transport Hub (including airports, ports and rail stations) • Disruption to Critical Supply Chains (fuel, food, medicine)	• Structural Collapse (including dam, tunnel, bridge and building) • Nuclear Incident (Abroad) • Cyber Incident (including ransom, infrastructure attack, digital networks) • Disruption of Energy Supply (including oil, gas, electricity and digital networks) • Disruption to Communication Infrastructure (telecom and satellite systems) • Disruption to Undersea Infrastructure (e.g. data cables, pipelines) • Risks from Artificial Intelligence (AI) and Autonomous Technologies • Failure of Emerging Tech (e.g. 5G, IoT, automated control systems)
Hazard: Geopolitical	Hazard: Emerging/Strategic
• Terrorists Incidents • Armed Conflict Abroad • Hybrid Threats (e.g. disinformation, sabotage) • Instability in Northern Ireland • Global Instability Affecting Supply Chains or Migration	• AI-Enabled Drone Threats • Infrastructure Failure Due to Ageing or Climate Impacts • Food Security Issues (supply distribution, climate-related crop failure)

	Economic Risks (protectionism, inflation, loss of competitive-ness)

15.2.3 Risk Assessment Methodology

The risk assessment methodology applied in this EIAR draws on both established emergency management principles and current national strategic risk policy. Hazard analysis and risk assessment are internationally recognised as essential steps in identifying challenges that may need to be addressed by society, particularly in the context of emergency planning and resilience building.

Mitigation as a risk treatment process involves reducing or eliminating the likelihood and/or the impact of an identified hazard (DoEHLG, 2010). While the National Risk Assessment 2023 (Department of the Taoiseach) presents Ireland's most up-to-date overview of strategic risks, it does not apply quantified recurrence intervals. Therefore, this EIAR adopts the likelihood classification framework previously used in A National Risk Assessment for Ireland (DOD, 2020), shown in Table 15-2, to support structured hazard evaluation.

The projects considered for potential cumulative developments are detailed in Chapter 2 of this EIAR. In addition to the standalone risk assessment, cumulative effects have been considered in the context of these developments. This includes potential interactions that may amplify risks related to emergency management, infrastructure capacity, and environmental resilience. The assessment draws on planning data and consultation with local authorities to ensure that cumulative risks are appropriately identified and mitigated.

Table 15-2 Classification of National Likelihood Criteria (Source: A National Risk Assessment for Ireland (2020) Department of Defence)

National Likelihood Criteria		
Rating	Classification	Average Recurrence Interval
1	Extremely Unlikely	500 or more years between occurrences
2	Very Unlikely	100-500 year between occurrences
3	Unlikely	10-100 years between occurrences
4	Likely	1-10 years between occurrences
5	Very Likely	Less than 1 year between occurrences

15.3 Predicted Effects

The chapters within this EIAR identify that the Proposed Development has been designed in accordance with best practice and that the Proposed Development can be safely undertaken without risk to human health and the environment.

In order to understand the potential consequences and predicted effects of any major accident or disaster due to the Proposed Development, and the vulnerability of the Proposed Development, a desk study was undertaken. The assessment reviewed:

- The vulnerability of the Proposed Development to major accidents or disasters; and

- The potential for the Proposed Development to cause risks to human health, cultural heritage and the environment, as a result of that identified vulnerability.

A methodology has been used including the following phases:

Phase 1: Assessment

The DOD Consolidated List of National Hazards was used to identify a preliminary list of potential major accidents and disasters. Receptors covered by legislation were not included within the assessment, for example, the infill operatives.

Phase 2: Screening

The list was screened and major events caused by geological faults or natural phenomena were not included as the site is not located in a tectonically active region. The likelihood of such events occurring is extremely low within the context of Ireland's stable geological setting. Examples of events screened include earthquakes, volcanic activity, and landslides. Risks such as building collapse, which have been comprehensively addressed through design measures and engineering controls, are acknowledged but not repeated in detail within this chapter to avoid duplication. Their integration into the design process demonstrates that such risks have been appropriately mitigated.

Phase 3: Mitigation and Evaluation

In the event that mitigation measures included did not mitigate the risk, then, the potential effects on receptors are identified in the relevant chapter. Table 15-3 lists the major accidents and/or disasters reviewed.

Table 15-3: Major Accidents and/or Disasters Reviewed

Major Accident or Disaster	Relevant for this Proposed Development?	Why relevant?	Potential Receptor	Covered within EIAR?
<u>Civil</u>				
Large Crowd Event (An event with over 5,000 people)	N	Not considered vulnerable due to the nature of the Proposed Development, i.e., infilling land.	N/A	N/A
Water Supply Contamination	Y	Waterborne diseases can be caused by consuming contaminated drinking water. No public health issues have been identified for the Proposed Development.	Local water users	Chapter 7 Hydrology and Hydrogeology of this EIAR identifies the control measures required to avoid contamination of water supplies during operational works.
Food Chain Contamination	N	Not considered vulnerable.	N/A	N/A
Animal Disease	N	Not considered vulnerable.	N/A	N/A
Terrorist Incident	N	Not considered vulnerable.	N/A	N/A
<u>Transportation</u>				
Maritime Incident	N	Not considered vulnerable. The closest port is Dun Laoghaire Port which is located approximately 83km east of the site.	N/A	N/A

Major Accident or Disaster	Relevant for this Proposed Development?	Why relevant?	Potential Receptor	Covered within EIAR?
Air Incident	N	Not considered vulnerable. The closest commercial airport is Dublin Airport, which is approximately 80km northeast of the site. The closest domestic airport is Dublin Weston Airport, which is approximately 50km northeast of the site. Naas Airfield has a single grass strip runway which is located approximately 48km east of the site. Laoise Flying Club is a small airstrip located approximately 8km northeast of the site.	N/A	Public safety zones are discussed in Section 15.4.2 of this chapter.
Transport Hub (Includes Airports, Ports and Rail Stations)	N	The site is not considered as a transport hub. Not considered vulnerable. The Portlaoise Train station is located approximately 4km south of the site.	N/A	N/A
<u>Natural</u>				
Archaeology	N	There are no recorded monuments located within the Proposed Development area or within 500m. No previous archaeological fieldwork has been carried out within the area of the development.	Cultural Heritage	Chapter 12 (Archaeology and Cultural Heritage) identifies the potential vulnerability of the project to effects on archaeological and cultural heritage resources and outlines measures to avoid, reduce, or mitigate adverse effects on known and potential heritage assets within and surrounding the site of the Proposed Development.
Landslides	N	The site of the Proposed Development is located within an area with a 'low' landslide susceptibility (GSI, 2026). There are no recorded landslides at the site (GSI, 2026). There are no potential ground stability hazards identified for the site.	Residents, service users, members of the public and nearby properties.	Chapter 6 (Land and Soils) identifies the vulnerability to landslides, and outlines measures incorporated into the design and methodology to avoid or mitigate such risks at the site of the Proposed Development.

Major Accident or Disaster	Relevant for this Proposed Development?	Why relevant?	Potential Receptor	Covered within EIAR?
Earthquakes	N	Earthquakes are not likely to occur in the vicinity of the site at a sufficient intensity to pose a risk for the Proposed Development.	N/A	N/A
Floods/ Storm surge/tidal flooding	Y	The site is located within Flood Zone C, indicating a low probability of flooding. The probability of flood from river and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding). The initial flood risk assessment stated that there have been no past flood events recorded within a 2.5km radius.	Proposed Development	Chapters 7 (Hydrology) identify the vulnerability of the Proposed Development to flooding related risks which confirms that appropriate measures have been incorporated into the design to manage and mitigate these risks in accordance with national guidance.
Severe weather such as storms, blizzards, droughts, tornados, heatwaves	N	Not considered vulnerable. In the event of severe weather events, the national meteorological service, Met Éireann, provides advance notice of severe weather, usually several days in advance. When appropriate, colour-coded weather warnings are issued. The Office of Emergency Planning works with the government departments and other key public authorities in order to ensure the best possible use of resources and compatibility across different emergency planning requirements.	N/A	N/A
Air Quality events	Y	Chapter 8 (Air Quality) identifies that the Proposed Development is not considered vulnerable to significant air quality effects because proactive measures will be deployed to minimise emissions during the operational phase. These measures include the use of dust suppression techniques and the requirement for vehicles and machinery to be turned off when idle. These measures are consistent with best practice and are designed to ensure compliance with relevant air quality standards and guidance.	Residents/workers	Chapter 8 Air Quality of this EIAR identifies the effect of the operation of the development on ambient air quality.
Wildfires	N	Not considered vulnerable due to the location of the site of the Proposed Development.	N/A	N/A

Major Accident or Disaster	Relevant for this Proposed Development?	Why relevant?	Potential Receptor	Covered within EIAR?
Fire	N	The risk of fire associated with Proposed Development is considered to be low. The nature of the infill activities primarily involves the placement and compaction of inert materials such as soil, subsoil, and certified construction waste that meet the required waste acceptance criteria. These materials are non-combustible and do not present an inherent fire hazard. The site will not accept or store flammable, putrescible, or combustible wastes, and operational controls will ensure that only authorised inert materials are deposited.	Residents, service users, members of the public and nearby properties.	Section 15.4.1 of this chapter outlines fire safety measures.
Invasive species	Y	Two walkover surveys were conducted at the site, including a preliminary ecological appraisal (PEA) walkover survey on 9th December 2025, as well as a follow up walkover including a detailed habitat survey conducted on the 26th January 2026. There were no invasives species recorded during either site walkover, it should be noted that these were undertaken outside of the botanical survey season. Given this, coupled with the fact that Japanese Knotweed (<i>Fallopia japonica</i>) a high impact Third Schedule of S.I. No. 477/2011 invasive species has been recorded within the 1km grid square of the site, a precautionary approach will be taken, and the presence of invasives on the site is not to be ruled out at this stage.	Native species/local biodiversity	Chapter 5 (Biodiversity) identifies the vulnerability of the project to invasive species and details measures to avoid the introduction or dissemination of invasive species to and from the site of the Proposed Development.
<u>Technological</u>				
Structural Collapse (Building)	N	There are no buildings proposed as part of the Proposed Development.	N/A	N/A
Structural Collapse (Dam, Bridge, Tunnel)	N	Not considered vulnerable as no dams, bridges or tunnels are proposed as part of the development.	N/A	N/A

Major Accident or Disaster	Relevant for this Proposed Development?	Why relevant?	Potential Receptor	Covered within EIAR?
Flood defence failure	N	Not relevant as no flood defence is required.	N/A	Chapter 7 (Hydrology and Hydrogeology) identifies the vulnerability of the project to flooding and outlines measures to manage and mitigate flood risk.
Nuclear incident	N	Not considered vulnerable.	N/A	N/A
Cyber incident	N	Not considered vulnerable.	N/A	N/A
Disruption of energy supply (oil, gas, electricity)	N	Not considered vulnerable. ESB Networks maintain the electricity network in Ireland. Gas Networks Ireland maintain the natural gas network in Ireland.	N/A	Chapter 13 (Material Assets – Waste and Utilities) identifies the infrastructure requirements of the Proposed Development, including energy supply, and outlines measures to ensure adequate provision and resilience.
Utilities failure (communications)	N	Not considered vulnerable. In Ireland, the fixed-line communications market is primarily served by operators such as Eir, Virgin Media, Vodafone, and Sky Ireland, with Eir. Mobile telecommunications infrastructure is operated by Eir, Vodafone, and Three, who collectively account for the majority of mobile subscriptions. Coordination with service providers will ensure the integration of high-speed broadband and mobile connectivity in line with national infrastructure standards.	N/A	Chapter 13 (Material Assets – Waste and Utilities) identifies the telecommunications requirements of the Proposed Development and outlines measures to ensure reliable connectivity.
Utilities failure (water supply)	N	Not considered vulnerable.	N/A	Chapters 7 (Hydrology and Hydrogeology) and 13 (Material Assets – Waste and Utilities) identify the water supply requirements of the Proposed Development and outline measures to ensure adequate and sustainable provision.

Major Accident or Disaster	Relevant for this Proposed Development?	Why relevant?	Potential Receptor	Covered within EIAR?
Utilities failure (wastewater, sewage)	N	Not considered vulnerable.	N/A	Chapters 7 (Hydrology and Hydrogeology) and 13 (Material Assets – Waste and Utilities) identify the wastewater and sewage treatment requirements of the Proposed Development and outline measures to ensure effective collection, removal, and treatment.
Utilities failure (solid waste)	N	Not considered vulnerable.	N/A	Chapter 13 Material Assets – Waste contains information on waste management
Industrial accidents (defence, energy, oil and gas refinery, food industry, chemical industry, manufacturing, quarrying, mining)	N	There are no Upper or lower Tier Seveso sites located near the Proposed Development. The closest Upper Tier Seveso site is William Grant & Sons Irish Manufacturing located approximately 24km northwest of the site. The closest Lower Tier Seveso site is Synergy Health Ireland Ltd. Located 27km northwest of the site.	N/A	N/A

15.3.1 Additional Consideration of Emerging and Strategic Risks

In addition to the major accidents and disasters reviewed in Table 15-3, emerging risks identified in the National Risk Assessment 2023, including digital exclusion, cyber threats, energy supply disruption, and AI-enabled technologies, have been considered in the context of the Proposed Development. Given the nature of the Proposed Development, these emerging risks are not expected to present significant vulnerabilities specific to the development. Standard design, operational protocols, and national infrastructure resilience frameworks are considered adequate to mitigate any indirect exposure to these strategic risks.

15.4 Management Plans

15.4.1 Emergency Response Plan

The risk of fire or major incidents at the Proposed Development is low, as the site will handle only inert, non-combustible materials and will not store or process hazardous or flammable wastes.

Potential emergency risks may arise from:

- Fuel storage for plant and machinery;
- Occasional hot works during maintenance;
- Electrical faults or overheating of equipment;
- Spills of fuels or hydraulic oils during refuelling or equipment failure.

These risks will be mitigated through standard site management measures, including:

- Secure, fully bunded fuel storage areas;
- Routine inspection and maintenance of machinery and electrical systems;
- Spill kits and fire extinguishers available on all plant and at key locations;
- Staff trained in emergency response, fire safety, and spill containment;
- Clear access routes to ensure prompt response by emergency services.

These measures will ensure that potential fire, spill, or safety risks are effectively managed and that the site is prepared to respond appropriately in the event of an emergency.

15.4.2 Public Safety Zone

Public Safety Zones (PSZs) are mapped out around airport runways to protect the public on the ground from possible aircraft crashes in populated areas. PSZs are used to prevent inappropriate use of land where the risk to the public is greatest, e.g., by limiting the type and allowable height of buildings and structures within the zones.

The closest commercial airport is Dublin Airport, which is approximately 80km northeast of the site. There are no PSZs directly over the site of the Proposed Development. There are no PSZs associated with Dublin Airport that extend over or near the Proposed Development.

The closest domestic airport is Dublin Weston Airport, which is located approximately 50km northeast of the site. Dublin Weston Airport currently implements PSZs in accordance with

Aviation Safeguarding and PSZ criteria, as highlighted in the South Dublin County Council Development Plan 2022-2028.

Laois Flying Club is a small airstrip located approximately 8km northeast of the site. Naas Airfield is a single grass strip runway, which is located approximately 48km east of the site.

Given the distance from both Dublin Airport and Dublin Weston Airport and the presence of mapped PSZs in the vicinity, the risk of an aircraft-related incident affecting the Proposed Development is considered negligible. Therefore, aircraft strike risk is not considered relevant to the assessment of this site.

15.4.3 Potential Major Emergency Management Sites and Seveso Sites

Seveso Sites are defined as industrial sites that due to the presence of dangerous substances in sufficient quantities, are regulated under Council Directives 96/82/EC and 2003/105/EC, commonly referred to as the Seveso II Directive. Seveso Sites are categorised as Lower, or Upper, by the type and quantity of hazardous substances stored at the site.

The Proposed Development is not classified as an establishment under the Control of Major Accident Hazard (COMAH) Regulations (SI 209 of 2015). The Proposed Development is not a regulated site under the Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations (2015) (COMAH), which implement the Seveso III Directive (2012/18/EU), and it is not connected to a regulated site.

While the Proposed Development site is located within County Laois, the site is in the Garda Division of Laois–Offaly which includes the districts of Birr, Portlaoise and Tullamore. There are no Upper or Lower Tier Seveso sites located near the Proposed Development. The closest Upper Tier Seveso site is William Grant & Sons Irish Manufacturing located approximately 24km northwest of the site. The closest Lower Tier Seveso site is Synergy Health Ireland Ltd. Located 27km northwest of the site.

Based on the distance of the Proposed Development from any Seveso Sites the risk of a potential major emergency is not considered relevant to this Proposed Development.

15.4.4 Flood Risk

According to the Office of Public Works' (OPW's) mapping portal, the site is not located in Flood Zone A or B. It is therefore considered to be in Flood Zone C, indicating a low probability of flooding.

15.4.5 Dust Management Plan

Strategies for dust management during the operational phase of Proposed Development are detailed in Chapter 8, Air Quality. With respect to the potential impacts from uncontrolled dust emissions identified in Chapter 8, the key objective of the Proposed Development is to manage activities to ensure any significant increase in dust emissions are minimised.

15.4.6 Noise Management Plan

Strategies for noise management during the operational phase of Proposed Development are detailed in Chapter 10, Noise and Vibration. With respect to the potential noise impacts identified in Chapter 10, the key objective of the Proposed Development is to manage activities to ensure any significant increase in noise emissions are minimised.

15.4.7 Spill Response Plan

Chapter 6, Land and Soils, and Chapter 7, Hydrology and Hydrogeology, has assessed the potential for spillages during the Proposed Development. Only small volumes of fuel/oils will be present on-site and therefore no significant effects are expected.

Fuel storage and refuelling procedures will be developed for the site; fuel will be stored in bunded tanks and spill kits will be available onsite including in vehicles operating onsite. Staff will be familiar with emergency procedures for in the event of accidental fuel spillages. All works will be undertaken in accordance with conditions of granted planning.

15.4.8 Invasive Alien Species

The spread of invasive alien species poses a risk to surrounding ecology and biodiversity. Two walkover surveys were conducted at the site, including a PEA walkover survey on 9th December 2025, as well as a follow up walkover including a detailed habitat survey conducted on the 26th January 2026.

There were no invasives species recorded during either site walkover, it should be noted that these were undertaken outside of the botanical survey season.

Given this, coupled with the fact that Japanese Knotweed (*Fallopia japonica*) a high impact Third Schedule of S.I. No. 477/2011 invasive species has been recorded within the 1km grid square of the site, a precautionary approach will be taken, and the presence of invasives on the site is not to be ruled out at this stage.

15.5 Residual Effects

Residual effects will be negligible once all control, mitigation and monitoring measures have been implemented. The potential for dust or noise from site operations to cause any nuisance to nearby receptors is deemed to be negligible and the adherence and full implementation of the appropriate control and mitigation measures will ensure there is no potential for cumulative effects to arise.

15.6 Monitoring

There is no monitoring required with regards to risk management. All monitoring proposals for the interacting chapters have been detailed in the relevant technical chapters and are included in Chapter 17 Mitigation Measures and Monitoring.

15.7 Difficulties Encountered When Compiling

No difficulties were encountered in completing this chapter.

15.8 Conclusion

The risk assessment undertaken as part of this EIAR has evaluated a comprehensive range of potential risks relevant to the Proposed Development, including flooding, fire, air quality events, invasive species, transportation-related risks, and technological or infrastructure failures. Across all categories, the assessment confirms that the Proposed Development has a low overall risk, with no significant vulnerabilities identified.

Each relevant EIAR chapter has assessed topic-specific risks and outlined appropriate mitigation measures in accordance with applicable national and EU guidance, including the EIA Directive, COMAH Regulations, Floods Directive, EPA EIAR Guidelines (2022), and national emergency planning and risk assessment frameworks. Embedded design and operational controls ensure robust management of potential site risks such as dust, noise, small-scale fuel handling, and unplanned spillages.

The site is located within Flood Zone C, where the probability of flooding is low, and is situated well outside any Public Safety Zones associated with airports. No Upper-Tier or Lower-Tier Seveso sites are present in the vicinity of the site, and therefore there is no relevant pathway for major-accident interactions. Site surveys identified no invasive alien species, and precautionary measures are in place given regional records for Japanese knotweed.

Emergency response, spill control, dust and noise management, and invasive species controls are all addressed through dedicated operational plans within this chapter and the associated technical chapters. Residual risks, following the implementation of these measures, are assessed as negligible, and no additional monitoring is required beyond that already specified in corresponding EIAR chapters and in Chapter 17: Mitigation and Monitoring.

Taking all of the above into account, the Proposed Development is considered suitable and environmentally resilient, with risks appropriately identified, assessed, and mitigated to ensure the safety, sustainability, and long-term integrity.

15.9 References

Chapters 4-14 of this EIAR.

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ISO 1996-2:2017 – *Acoustics - Description, Measurement and Assessment of Environmental Noise - Part 2: Determination of Sound Pressure Levels*.

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S.I. 21 of 1990. Local Government (Water Pollution) (Amendment) Act, 1990.

S.I. 38 of 2000. Wildlife (Amendment) Act, 2000.

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Transport Infrastructure Ireland (2024): *Carbon Tool for Road, Greenway and Light Rail Projects: User Guidance Document GE-ENV-01106*.

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Waste Management (Facility Permit and Registration) Regulations 2007 (S.I. No. 821 of 2007) as amended 2008 (S.I. No. 86 of 2008), 2014 (S.I. No. 320 and No. 546 of 2014), and 2015 (S.I. No. 198 of 2015).

Waste Management (Licensing) Regulations 2004 (S.I. No. 395 of 2004) as amended 2010 (S.I. No. 350 of 2010).

16 INTERACTIONS

16.1 Introduction

As a requirement of the Planning Regulations and the Environmental Protection Agency's 'Guidelines on information to be contained in Environmental Impact Assessment Reports' (2017), interrelationships between various environmental aspects must be considered when assessing the impact of the Proposed Development, as well as individual significant impacts. The significant impacts of the Proposed Development and the proposed mitigation measures have been detailed in the relevant chapters of this report. However, as with all developments that pose potential environmental impacts, there also exists potential for interactions/interrelationships between the impacts of different environmental aspects. The results may exacerbate or ameliorate the magnitude of impacts. This chapter of the EIAR addresses the interactions between the various environmental factors of the Proposed Development.

The following Section is directed by Article 3 section 1(e) of the EIA Directive. The EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022), Advice Notes for Preparing Environmental Impact Statements (Draft, September 2015) and OPR Practice Note PN02 Environmental Impact Assessment Screening (June 2021) were also considered.

Article 3 of the Directive states:

1. *The environmental impact assessment 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 attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;*
 - c) *land, soil, water, air and climate;*
 - d) *material assets, cultural heritage and the landscape;*
 - e) *the interaction between the factors referred to in points (a) to (d)*

16.2 Study Methodology

The interactions between impacts on different environmental factors have been addressed throughout this EIAR. Close co-ordination and management with the EIAR team was carried out to ensure that all likely relevant interactions were addressed at the scoping stage of the EIAR, and interactions have been adequately assessed.

Following an assessment of the EIAR, a matrix was produced to display where interactions between impacts on different factors have been addressed. This has been carried out by use of chapter headings included in the EIAR and details of any interaction during all phases of the Proposed Development.

16.3 Interactions

The following matrix has been produced to show where potential significant interactions between effects on different factors have been addressed, see Table 16-1.

As this EIAR has been prepared by a number of specialist consultants, an important aspect of the EIA process was to ensure that interactions between the various disciplines have been taken into consideration. The principal interactions requiring information exchange between the environmental specialists and the design team are summarised in Table 16-2 to Table 16-10.

Table 16-1: Interactions between Factors

Interaction	Population and Human Health	Biodiversity	Land and Soils	Hydrology and Hydrogeology	Air Quality	Climate	Noise and Vibrations	Landscape and Visual	Archaeology and Cultural Heritage	Material Assets: Traffic	Material Assets: Waste and Utilities
Population and Human Health											
Biodiversity											
Land and Soils											
Hydrology and Hydrogeology											
Air Quality											
Climate											
Noise and Vibration											
Landscape and Visual Amenity											

Archaeology, Architectural and Cultural Heritage											
Material Assets – Traffic											
Material Assets: Waste and Utilities											

	Potential Interaction
	Potential Interaction No Interaction
	N/A

Table 16-2 Population and Human Health

Population and Human Health	
Summary	
Chapter 4 of this EIAR, <i>Population and Human Health</i>, details the direct and indirect effects of the Proposed Development on Population and Human Health; and sets out any required mitigation measures where appropriate. The Proposed Development has the potential to cause dust nuisances during the construction phase as well as noise and vibrations from plant machinery and traffic.	
Interactions	
Hydrology and Hydrogeology	Interactions between water and population and human health have been considered. The Proposed Development has the potential to cause health issues as a result of impacts on local water. However, the mitigation measures outlined in Chapter 7 outlines that the Proposed Development will not result in significant effects on water which therefore will not have a significant effect on the local population.
Air Quality	Interactions between air quality and population and human health have been considered. The Proposed Development has the potential to cause health issues as a result of impacts on air quality. However, the mitigation measures outlined in Chapter 8 Air Quality will ensure that all impacts are compliant with ambient air quality standards and human health will not be affected.
Noise and Vibrations	Interactions between noise and population and human health have been considered. The Proposed Development has the potential to cause health issues as a result of noise and vibrations. However, the mitigation measures outlined in Chapter 10 Noise and Vibration outlines that the Proposed Development will not result in significant effects which therefore will not have a significant effect on the local population.
Landscape and Visual	Interactions between landscape and visual and human health have been considered. The Proposed Development has the potential to cause nuisance to the local population. However, the mitigation measures outlined in Chapter 11 Landscape and Visual outlines that the Proposed Development will not result in significant effects which therefore will not have a significant effect on the local population.
Traffic	Interactions between transport and human health have been considered. The Proposed Development has the potential to cause a nuisance to the local population. However, the mitigation measures outlined in Chapter 14: Material Assets: Traffic and Transport outlines that the Proposed Development will not result in significant effects which therefore will not have a significant effect on the local population.
Conclusions	
Significant adverse impacts on Hydrology and Hydrogeology, Air Quality, Noise and Vibration, Landscape and Visual and Traffic are not expected to occur and mitigation measures have been set out for any of these potential interactions.	

Table 16-3: Biodiversity

Biodiversity	
Summary	
Chapter 5 of this EIAR, Biodiversity, details the direct and indirect effects of the Proposed Development on the local flora and fauna; and sets out any required mitigation measures where appropriate.	
Interactions	
Air Quality	An assessment of the potential impact of the Proposed Development on air quality and climate is included in Chapter 8 of this EIAR. Dust emissions arising from the construction phase of the Proposed Development were identified as having potential impacts on local biodiversity. Once dust minimisation measures are implemented, impacts to biodiversity are not predicted to be significant.
Hydrology and Hydrogeology	The key environmental interaction with biodiversity is water. An assessment of the potential impact of the Proposed Development on the hydrological and hydrogeological environment is described in Chapter 7 - 'Hydrology' of this report, to ensure the quality (pollution and sedimentation) and quantity (surface water run-off) of water is of appropriate standard. Interactions between hydrology and biodiversity can occur through impacts to water quality, arising, for example from an accidental pollution event during the Construction and operational phase.
Conclusions	
There are interactions between this Biodiversity Chapter and the Air Quality, Hydrology, and Hydrogeology Chapters due to the assessment of potential pathways to European sites, designated sites and aquatic environments via air, hydrological and hydrogeological pathways. The air, groundwater and surface water pathways discussed in these chapters are considered applicable to this chapter with regard to Source-Pathway-Receptor (S-P-R) pathways. Any mitigation or considerations of the air, ground and surface water pathways contained within those chapters are relevant to the biodiversity assessment with regard to the aquatic environment. There are no interactions foreseen which could pose a risk due to accumulation of multiple non-significant effects resulting from the Proposed Development on the lands within the EIAR study area.	

Table 16-4: Land and Soils

Land and Soil	
Summary	
Chapter 6 of this EIAR, <i>Land and Soil</i>, details the direct and indirect effects of the Proposed Development on the local land, soils, and geology; and sets out any required mitigation measures where appropriate. There are a number of potential pollutants associated with the operational phases which have the potential to impact on the environment. The infilling of soils at the site has the potential to generate nuisance impacts such as dust, noise and sediment run-off. Consideration is given to habitats and species protected by national and international legislation or considered to be of particular conservation importance.	
Interactions	
Population and Human Health	An assessment of the potential effect of the Proposed Development on human health is included in Chapter 4 of this EIAR. There is a potential risk of dust generated from the limited excavation and stockpiling of soil during the construction phase and from infilling and recontouring during the operational phase of the Proposed Development, posing a human health risk in the absence of standard avoidance and mitigation measures, which will be implemented to be protective of human health. Appropriate industry standards and health and safety legislative requirements will be implemented during the construction phase of the Proposed Development that will be protective of site workers.
Biodiversity	An assessment of the potential effects of the Proposed Development on the biodiversity of the site, particularly habitats, flora and fauna that may be affected by the excavation, stockpiling, infilling and recontouring of materials during the construction and operational phase of the Proposed Development is provided in Chapter 5 of this EIAR. It also provides an assessment of the effects of the Proposed Development on habitats and species, particularly those protected by national and international legislation or considered to be of particular conservation importance and proposes measures for the mitigation of these effects.
Hydrology and Hydrogeology	An assessment of the potential effect of the Proposed Development on the hydrological and hydrogeological environment is included in Chapter 7 of this volume. In the absence of avoidance, remedial, and mitigation measures, construction and operational activities may potentially create pathways for potential sources of contamination to enter underlying groundwater. Activities at the site will involve the use of potentially hazardous materials such as fuels, oils, and other substances. An uncontrolled release of these materials, whether through containment failure or handling accidents, could effect the surrounding environment. In addition, in the absence of avoidance, remedial and mitigation measures, there is a potential for sediment to enter the drainage ditches and potentially discharge to the nearby waterbodies. Procedures for the protection of the receiving water environment are set out in Chapter 7 of this EIAR.

Air Quality	The limited excavation of soils, temporary stockpiling, infilling and recontouring which will occur at the site have the potential to generate nuisance effects (i.e., dust) during the construction and operational phase of the Proposed Development. An assessment of the potential effect of the Proposed Development on air quality is included in Chapter 8 of this EIAR.
Landscape and Visual	During the construction phase and into the operational phase of the Proposed Development, the site landscape will undergo a change from cutover bog to recontoured agricultural lands. An assessment of the potential effect of the Proposed Development on the receiving landscape is included in Chapter 11 of this EIAR.
Material Assets: Waste, Traffic and Transport	The Proposed Development will include site clearance (i.e., removal of vegetation, silt fences, etc.) with and offsite removal of surplus material, construction of the TCC and associated works, widening of the access road, with subsequent infilling and recontouring. Where possible, it is intended to retain and reuse the limited excavated topsoil and subsoil on the site during the construction phase of the Proposed Development. However, where required, unsuitable soil and subsoil will be removed offsite in accordance with all statutory legislation. An assessment of the potential effect of the Proposed Development on the material assets (traffic and transport and waste management) during the construction and operations phase of the Proposed Development is included in Chapter 13 and Chapter 14 of this EIAR, respectively.
Conclusions	
Potential impacts have been outlined in the respective Chapters specified above. The mitigation measures outlined in the OCEMP (Lenztech, Dec 2023) and the respective Chapters outlined above, will ensure that there will be no significant adverse impacts on the receiving land, soil and geology associated with the construction phase and the operational phase of the Proposed Development.	

Table 16-5: Hydrology and Hydrogeology

Hydrology and Hydrogeology	
Summary	
Chapter 7 of this EIAR, <i>Hydrology and Hydrogeology</i> , provides an assessment of the potential impacts of the Proposed Development on hydrology, water and hydrogeology and sets out any required mitigation measures where appropriate. Consideration is given to habitats and species protected by national and international legislation or considered to be of particular conservation importance.	
Interactions	
Population and Human Health	An assessment of the potential impact of the Proposed Development on human health is included in Chapter 4 of this EIAR. Pollution events can impact the water quality and thus impact the human health of the surrounding population. Appropriate surface water control measures will be implemented as part of the Proposed Development. Appropriate industry standard and health and safety legislative requirements will be implemented during the construction phase and operational phase of the Proposed Development, that will be protective of site workers.
Land, Soil and Geology	An assessment of the potential impact of the Proposed Development on the land and soils is included in Chapter 6 of this EIAR. During the construction and operational phase of the Proposed Development, the importation of the fill material (i.e., clean inert soil and stone) can impact the structure and quality of the existing soils at the site. However, appropriate mitigation controls under Article 27 regulations will be implemented during the construction phase and operational phase of the Proposed Development, which will be protective of the soil and geology.
Biodiversity	An assessment of the potential impacts of the Proposed Development on the Biodiversity of the site, with emphasis on habitats, flora and fauna which may be impacted during the construction phase and infilling is included in Chapter 5 of this EIAR. It also provides an assessment of the impacts of the Proposed Development on habitats and species, particularly those protected by national and international legislation or considered to be of particular conservation importance and proposes measures for the mitigation of these impacts.
Air Quality	The filling of the drainage ditches, infilling of the site with clean soil and stone and recontouring at the site have the potential to generate nuisance effects (i.e., dust) during the construction and operational phase of the Proposed Development. An assessment of the potential effect of the Proposed Development on air quality is included in Chapter 8 of this EIAR.
Landscape and Visual	During the construction phase and into the operational phase of the Proposed Development, the site landscape will undergo a change from cutover bog to recontoured agricultural lands.

	An assessment of the potential effect of the Proposed Development on the receiving landscape is included in Chapter 11 of this EIAR.
Material Assets: Waste, Traffic and Transport	The Proposed Development will include the filling of the drainage ditches and infilling of the site, with subsequent recontouring of the site. An assessment of the potential effect of the Proposed Development on the material assets (traffic and transport and waste management) during the construction and operations phase of the Proposed Development is included in Chapter 13 and Chapter 14 of this EIAR, respectively.
Conclusions	
The protective/avoidance/mitigation measurements that will be applied as set out in the OCEMP (Lenztech, Dec 2023), will ensure that the Proposed Development will not give rise to any likely significant impacts.	

Table 16-6: Air Quality

Air Quality	
Summary	
Chapter 8 of this EIAR, <i>Air Quality</i> , provides an assessment of the potential impacts of the Proposed Development on ambient air quality, and sets out appropriate mitigation measures where necessary.	
Interactions	
Population and Human Health	Interactions between air quality and population and human health have been considered as potential health-related impacts may arise from dust nuisance, including Respirable Crystalline (RCS) and traffic-derived pollutants. Fine particulate matter containing RCS may be generated during dry handling and infilling activities. These particles pose a recognised occupational health risk, particularly for on-site workers. With the implementation of the mitigation measures outlined in Section 8.6 of the Population and Human Health Chapter, the residual risk to on-site workers is considered low and manageable. The Disamenity Dust Assessment has concluded that there will be an overall negligible impact on sensitive receptors as a result of the Proposed Development. Nevertheless, appropriate mitigation measures will be incorporated to substantially reduce any likelihood of fugitive emissions causing an impact on sensitive receptors. These measures will ensure compliance with ambient air quality standards and protect human health. Furthermore, traffic-related pollutants have been assessed and determined as having an overall insignificant effect, therefore air quality effects from the Proposed Development are not expected to have a significant effect on population and human health.
Biodiversity	Interactions between Air Quality and Biodiversity have been considered as the operational phase has the potential to interact with flora and fauna in adjacent habitats and designated sites due to dust emissions arising from the operational works. However, the mitigation measures employed at the Proposed Development will ensure that the impacts to flora and fauna are not significant.
Land and Soils	Interactions between air quality and land and soils have been considered, particularly in relation to dust deposition during the operational phase. Fugitive dust emissions may settle on exposed soil surfaces, potentially altering surface characteristics or contributing to minor changes in soil chemistry. However, given the nature of the material being extracted and the implementation of effective dust mitigation measures (), the likelihood of dust accumulation at levels that would adversely affect soil quality is low. In addition, site management practices, including topsoil handling, bunding, and phased excavation, will further reduce the potential for dust-related impacts on soil resources. As such, no significant air quality-related effects on land and soils are anticipated.

Climate	Interactions between air quality and climate have been considered, particularly in relation to emissions of greenhouse gases (GHGs) and particulate matter during the operational phase of the Proposed Development. Infilling activities, including the transport and infilling of materials, primarily generate coarse particulate matter (PM10), which is associated with dust nuisance but does not significantly contribute to climate change. However, fine particulate matter (PM2.5), including RCS may be generated during dry processing and handling. These finer particles are more relevant to human health than to climate impacts. GHG emissions may arise from fuel combustion in mobile plant, machinery and vehicles. While these emissions are expected to be relatively low, they represent the primary air-quality related contribution to climate change from the Proposed Development. Mitigation measures, as outlined in Section 8.6 of the Air Quality Chapter, including minimising engine idling, maintaining equipment and reducing haul distances, will help reduce fuel consumption and associated GHG emissions. These measures support broader climate objectives by improving operational efficiency and reducing the carbon footprint of the site. Based on the nature and scale of the Proposed Development, and the mitigation measures proposed, no significant air quality-related effects on climate are anticipated.
Traffic	There can be a significant interaction between air quality and traffic. This is due to traffic-related pollutants that may arise during both the construction and operational phases. In the current assessment, traffic derived pollutants which may affect air quality have been deemed not significant. Therefore, the effect of the interaction between air quality and traffic is not significant for both the construction and operational phases of the Proposed Development.
Conclusions	
Mitigation measures employed at the Proposed Development will ensure that no significant impacts occur.	

Table 16-7: Climate

Climate	
Summary	
Chapter 9 of this EIAR, Climate, details the direct and indirect effects of the Proposed Development on the climate; and sets out any required mitigation measures where appropriate. Climate interactions with various environmental topics are extensive and significant, highlighting the broad effect of climate factors across different aspects of the environment. The “avoidance, remediation and mitigation” section of this Chapter outlines effective management and reduction measures for the following identified interactions. One of the most critical interactions is between climate and GHG emissions. The Proposed Development’s carbon footprint, including emissions from construction and operational activities, energy use, transportation, and agriculture play a role in influencing climate change. Effective management and reduction measures for these emissions are outlined in the mitigation section to support climate resilience and regulatory compliance.	
Interactions	
Population and Human Health	Human health and well-being are closely linked to climate factors. Climate change can exacerbate health issues such as heat stress, respiratory conditions, and vector-borne diseases. While the Population and Human Health Chapter focuses on direct health determinants, the Climate Chapter also considers indirect pathways through which climate-related measures may influence public health. These include: • Air quality impacts from construction and operational traffic/vehicles/machinery, which are addressed in parallel with climate assessment; • Noise and vibration disturbance, particularly in relation to sensitive receptors such as residential dwellings; • Sustainable farming practices, which contributes to improved air quality, and enhanced visual impact; • SuDS and water management systems, which reduce flood risk and associated health hazards; and • Traffic emissions, which were assessed using DMRB LA 114 criteria for both construction and operational phases, confirming no significant climate-related health effects These measures support climate resilience and help safeguard public health in the context of a changing climate.
Biodiversity	Climate change can alter habitat conditions, encourage spread of invasive species, disrupt species distributions, and affect ecological balances. These shifts may impact local flora and fauna, particularly in sensitive coastal and estuarine environments adjacent to the Proposed Development. The Biodiversity Chapter outlines a suite of mitigation and enhancement measures that directly support climate resilience, including: • Retention of native tree and hedgerow species. • Sustainable drainage systems (SuDS) to manage water quality and quantity; and • Lighting design to reduce disturbance to nocturnal species. • Long-term habitat management, including for the prevention of the introduction and spread of invasive species.

	• Biodiversity measures listed above and included within the Biodiversity Chapter align with national and EU climate adaptation strategies, contributing to broader goals such as carbon neutrality, nature-based solutions, and ecosystem-based adaptation. Such strategies include: • CAP25 explicitly supports a transition to a biodiversity-rich, climate-resilient, and environmentally sustainable economy • National Adaptation Framework (NAF) 2025, which identifies biodiversity as a priority sector for climate adaptation, promotes ecosystem-based adaptation and nature-based solutions to address climate risks such as flooding, drought, and habitat loss, and encourages local and sectoral adaptation plans to integrate biodiversity and climate resilience. • EU Adaptation Strategy (2021 Update) which emphasizes nature-based solutions (NbS) as a key cross-cutting priority. Supports ecosystem restoration, urban greening, and coastal protection as climate adaptation tools, and promotes integration of NbS into urban planning, water management, and disaster risk reduction. • EU Biodiversity Strategy 2030 which aims to restore at least 30% of degraded ecosystems by 2030. Recognizes biodiversity as essential for climate mitigation and adaptation, and supports green infrastructure and ecological connectivity to enhance resilience. These measures contribute to carbon sequestration, ecological connectivity, enhancing the site's resilience to climate change and supporting long-term biodiversity conservation.
Land and Soils	Climate change can affect soil moisture, erosion rates, and land productivity. Increased rainfall may lead to soil erosion, while extended dry periods can degrade soil quality. The Proposed Development includes mitigation measures to manage these risks. As mentioned in the Land and Soils Chapter (Chapter 6) the operational phase of the Proposed Development will involve the importation of soil and stone to the site to restore 2.92ha of the total site, which will be sourced from local development sites and their subsequent spreading and infilling. In relation to climate, the infilling and restoring of the land to a more natural state provides several benefits, including improved soil drainage, enhanced potential for biodiversity, and improves carbon sequestration. As documented in the Outline Construction Environmental Management Plan (Lenztech, 2023), carried out by Lenztech Surveying & Engineering Ltd. on behalf of BM Lynch Construction & Civils, the development is designed to facilitate the recovery of excavated inert soil and stone (by-product) from local greenfield residential development sites and proposes the infilling with an estimated maximum volume of 50,250m³ (85,000 tonnes). The Outline Construction Environmental Management Plan (OCEMP) (Lenztech, 2023), outlines procedures for managing soil stockpiles, preventing dust generation, and controlling runoff, all of which are critical in the context of climate variability. No significant adverse effects are anticipated during the operational phase, and the site will be suitable for long-term residential and commercial use.
Hydrology and Hydrogeology	Climate variability, such as increased rainfall or prolonged droughts, can affect water availability, quality, and management practices. This includes effects on stormwater runoff, flood risk, and water supply. The Hydrology Chapter outlines the Proposed Development's water management strategies, including SuDS,

	attenuation systems, and flood resilience measures, ensuring robustness against future climate scenarios.
Air Quality	Air quality and climate are interrelated due to shared sources of emissions, particularly from the combustion of fossil fuels during both the construction and operational phases. These activities generate pollutants that contribute to both local air quality impacts and global climate change. The air quality assessment was undertaken in parallel with the climate assessment to ensure consistency in evaluating emissions and their potential impacts.
Material Assets: Waste and Utilities	Waste management strategies, including prevention, reuse, recycling, and recovery, are aligned with national and EU circular economy policies, supporting the minimisation of waste generation and the maximisation of resource efficiency. These measures contribute to climate mitigation by reducing emissions associated with waste disposal and energy consumption. Furthermore, the adoption of Sustainable Drainage Systems (SuDS) and efficient water management practices helps to manage surface water runoff and reduce potential climate-related vulnerabilities, such as flooding. The direct and indirect effects of these infrastructure and operational choices on climate, including GHG emissions and resilience to climate change, are assessed in detail within the Climate Chapter.
Archaeology and Cultural Heritage	Cultural heritage sites are at risk due to climate change, with increased weathering, flooding, and temperature fluctuations potentially accelerating their deterioration. Mitigation measures employed at the Proposed Development will ensure that no significant impacts occur.
Material Assets: Traffic	Traffic-related emissions are a key contributor to climate change. The UK Highways Agency's DMRB guidance document LA 114 (2019) outlines criteria for determining whether a detailed climate assessment is required. These include: • A change of more than 10% in Annual Average Daily Traffic (AADT); • A change of more than 10% in the number of heavy-duty vehicles; or • A change in daily average speed of more than 20 km/hr The AADT will not increase by more than 10% nor will a change in average speed limit of more than 20km/hr occur in any of the road links as a result of the proposed development. However, Heavy-Goods Vehicles (HGV) shall increase from 54 to 65 in the opening year (2027), an increase of 8 no. HGVs or 15%. As a result, a detailed assessment of traffic related CO2 emissions was conducted see table 9-2. Further details are provided in Chapter 8 Air Quality. The direct effects of these traffic related emissions on climate, including GHG emissions, monitoring and mitigation are assessed in detail within the Climate Chapter
Conclusions	

In summary, the Proposed Development's interactions with climate encompass a range of factors including GHG emissions, water resources, biodiversity, soil, human health, and cultural heritage. Effective mitigation strategies and robust monitoring will be essential to address these interactions, minimise adverse effects, and ensure the development's resilience to climate change.

Table 16-7: Noise and Vibration

Noise and Vibration	
Summary	
Chapter 10 of this EIAR, <i>Noise and Vibration</i>, provides a description and assessment of the likely impact of the proposed activities from noise, and sets out appropriate mitigation measures where necessary. Noise-generating activities during the construction phase are not expected to have adverse implications for biodiversity. Noise associated with the operation of on-site machinery will not create any major negative impacts beyond the site boundary. Mitigation and monitoring measures will be incorporated to further reduce the potential for noise generation from the Proposed Development.	
Interactions	
Population and Human Health	In this EIAR, the Noise and Vibration Chapter has been developed in close coordination with the Population and Human Health Chapter to assess the potential effects of noise on NSLs. The location of NSLs informed the selection of assessment locations for noise modelling. Predicted noise levels from both the construction and operational phases have been evaluated in terms of their potential effects on human health, including annoyance and disturbance. The integrated approach ensures that the assessment considers, not only technical compliance with noise limits, but also the broader implications for community wellbeing.
Material Assets: Traffic and Transportation	This Chapter incorporates data from the traffic consultants to assess the potential noise effects from both construction and operational traffic associated with the Proposed Development. Annual Average Daily Traffic (AADT), vehicle speed and vehicle types (including HGVs) have been considered to calculate the additional noise generated by the Proposed Development, relative to the baseline conditions. Based on the predicted increase in traffic volumes, a predicted increase of less than 1dB during the operational phase of the Proposed Development, this increase is considered negligible, as the lowest decibel change the human ear can discern is 3dB making this increase negligible in terms of magnitude of change.
Conclusions	
Noise associated with the operational and construction phase will not create any significant adverse impacts beyond the site boundary. Mitigation and monitoring measures will be incorporated to further reduce the potential for noise generation from the Proposed Development.	

Table 16-8: Landscape and Visual

Landscape and Visual	
Summary	
Chapter 11 of the EIAR, Landscape and Visual Assessment, provides a description and assessment of the likely impact of the Proposed Development on the landscape and visual amenities of the area.	
Interactions	
Population and Human Health	It is not considered that the Proposed Development by virtue of its visual appearance of the Proposed Development and the nature of the surrounding landscape, will cause any issues for the residential local population.
Biodiversity	The site interacts with its biodiversity and ecology through the changes that will occur to the existing habitats and flora at the site. The proposals will entail losses and contributions in terms of vegetation at the site, which in turn will affect the ecology of the Site. Whilst the Site in its current condition is of good ecological value to a number of receptors, the proposed landscaping will not result in significant adverse effects provided all mitigations outlined within the Biodiversity Chapter are implemented.
Archaeology and Cultural Heritage	As there are no known archaeological or architectural remains found during the desk top survey as well as the walkover survey, it is not predicted that any changes in landscape or visual impact will affect in any way the archaeology of the area.
Conclusions	
No significant effect interactions identified for Landscape and Visual aspects of the surrounding environment are expected from the Proposed Development.	

Table 16-9: Archaeology and Cultural Heritage

Archaeology and Cultural Heritage	
Summary	
Chapter 12 of the EIAR, <i>Archaeology and Cultural Heritage</i> , provides information on the known architectural, archaeological, and cultural heritage sites in the study area.	
Interactions	
N/A	No interactions have been identified.
Conclusions	
No interactions have been identified.	

Table 16-10: Material Assets – Traffic and Transport

Material Assets – Traffic and Transport	
Summary	
Chapter 13 of the EIAR, <i>Material Assets: Traffic and Transport</i> , provides an assessment of the potential impacts of the Proposed Development on Material Assets including traffic, built services and infrastructure.	
Interactions	
Noise and Vibrations	The analysis contained within Chapter 13 interacts with the Noise Assessments contained within this EIAR. This is primarily due to the potential for an increase in HV traffic movements on the surrounding road network due to development.
Conclusions	
With the implementation of all mitigation measures detailed in Chapter 13, there will be no negative residual impacts upon the Material Assets: Traffic and Transport.	

Table 16-11: Material Assets: Waste and Utilities

Material Assets - Waste and Utilities	
Summary	
Chapter 14 of the EIAR, <i>Material Assets: Waste and Utilities</i> , provides an assessment of the potential impacts of the Proposed Development on Material Assets including waste and utilities.	
Interactions	
Population and Human Health	Proper waste management and the use of enclosed bins will prevent nuisance effects such as odour or littering, thereby protecting the health and amenity of site workers and any nearby residents. The continuation of existing utilities and infrastructure ensures no disruption to local services. Chapter 4 Population and Human Health of this EIAR has concluded that no long-term, adverse effects are likely to impact on Population and Human Health as a result of the Proposed Development.
Land and Soil	Where possible, it is intended to retain and reuse the limited excavated topsoil and subsoil on the site during the construction phase of the Proposed Development. However, where required, unsuitable soil and subsoil will be removed offsite in accordance with all statutory legislation. Potential impacts on land and soil are addressed in Chapter 6 of this EIAR.
Hydrology and Hydrogeology	Waste will be managed in a manner that prevents any risk of leachate or runoff, ensuring protection of surface and groundwater quality. Potential impacts on water and hydrology are addressed in Chapter 7 of this EIAR.
Climate	The use of existing utilities and infrastructure minimises the carbon footprint associated with construction and operational activities. Waste will be collected by authorised contractors, and no significant greenhouse gas emissions are expected from waste handling. Potential impacts on climate are addressed in Chapter 9 of the EIAR.
Traffic	The Proposed Development is expected to generate 4 no. two-way HGV movements per operational day, with a not significant overall impact on the environment. Potential impacts on traffic are addressed in Chapter 13 of this EIAR.
Conclusions	
With the implementation of all mitigation measures detailed in Chapter 14, there will be no negative residual impacts upon the Material Assets: Waste and Utilities.	

17 MITIGATION AND MONITORING MEASURES

17.1 Introduction

This Environmental Impact Assessment Report (EIAR) has assessed the impacts and resulting effects likely to occur as a result of the Proposed Development on the various aspects of the receiving environment.

The Proposed Development will be operated in a manner that will ensure that the potential impacts on the receiving environment are avoided where possible. In cases where impacts or potential impacts have been identified, mitigation measures have been proposed to reduce the significance of particular impacts. These mitigation recommendations are contained within each chapter exploring specific environmental aspects.

This chapter of the EIAR collates and summarises the mitigation commitments made in Chapter 4 to Chapter 13.

17.2 Summary of Mitigation Measures

17.2.1 Population and Human Health

17.2.1.1 Construction Phase

17.2.1.1.1 Mitigation

No specific mitigation measures are required during the construction phase of the Proposed Development in relation to population and human health, given the lack of direct effects resulting from the Proposed Development. However, where required, mitigation measures in relation to water quality, air quality, climate, noise and vibration, traffic and landscape and visual are identified in their respective chapters in this EIAR.

17.2.1.1.2 Monitoring

No specific monitoring measures are required during the construction phase of the Proposed Development in relation to population and human health. However, where required, mitigation measures in relation to water quality, air quality, climate, noise and vibration, traffic and landscape and visual are identified in their respective chapters in this EIAR.

17.2.1.2 Operational Phase

17.2.1.2.1 Mitigation

No specific mitigation measures are required during the operational phase of the Proposed Development in relation to population and human health, given the lack of direct effects resulting from the Proposed Development. However, where required, mitigation measures in relation to water quality, air quality, climate, noise and vibration, traffic and landscape and visual are identified in their respective chapters in this EIAR.

17.2.1.2.2 Monitoring

No specific monitoring measures are required during the operational phase of the Proposed Development in relation to population and human health. However, where required, mitigation measures in relation to water quality, air quality, climate, noise and vibration, traffic and landscape and visual are identified in their respective chapters in this EIAR.

17.2.2 Biodiversity

Avoidance by Design

A 10m buffer zone is to be implemented along the western boundary of the site which will act to avoid impacts to the western most drainage ditch. This will prevent the accidental destruction of this habitat by helping mitigate impacts of the Proposed Development on the drainage ditch water quality.

A 1m border of retained vegetation will also be kept around the perimeter of the site boundary to help avoid impacts to the adjacent habitats and help prevent negative impacts from occurring on potential faunal species which the habitat may support.

17.2.2.1 Construction Phase

17.2.2.1.1 Mitigation

Table 17-1 gives a summary of the best practice development standards and mitigation measures to be implemented during the construction phase of the Proposed Development. The measures listed are outlined in more detail in the Outline Construction Environmental Management Plan (OCEMP) (Lenztech, 2023) accompanying this application under separate cover.

Table 17-1. Summary of Best Practice Standards and Mitigation outlined in the OCEMP (Lenztech, 2023). Where specific details relating to Key Ecological Receptors is required under these measures, reference is made to the appropriate section in the report.

Theme	Best Practice Standards and Mitigation	Ecology Specific Mitigation Required
Soils and Geology	Appropriate measures to store and handle stripped topsoil and subsoil; consideration of weather conditions to minimise silt/sediment entering surface water network and dust control; and appropriate fill material import, storage and handling away from surface water features. Appropriate measures to prevent the discharge of contaminated water via surface water or ground water runoff from Site. Appropriate storage of fuels, oils and other chemicals, designated refueling and maintenance area, and preparation of emergency response procedure.	Yes – see Mitigation 1 to Mitigation 5 outlined below.
Water - Hydrogeology	Measures for surface water discharge and sediment/contaminant control through use of silt barriers and filter systems, wheel washing measures, prevention and control of accidental spills and leaks, concrete handling.	Yes – See Mitigation 2 to Mitigation 5 outlined below.

Water Supply, Drainage & Utilities	Appropriate use of suds, foul water to be tankered off site for treatment and no connections (waste water, water supply, electrical, gas and telecommunications) to be made.	No.
Site Compound Facilities and Parking	Appropriate measures to handle foul water generated, protect potable water supply, health and safety, separate areas for (i) machinery and plant; (ii) concrete batching; and (iii) staff parking.	No.
Landscape and Visual Impact	Establishment of Tree Protection Zones in accordance with BS 5837:2012 ' <i>Trees in Relation to Design, Demolition and Construction – Recommendations</i> ';	Yes – see Mitigation 6 outlined below.
Noise and Vibration	To comply with the requirements of BS 5228-1:2009+A1:2014 and BS 5228-2:2009+A1:2014 (Code of Practice for Noise and Vibration Control on Construction and Open Sites) as well as Safety, Health and Welfare at Work (General Application) Regulations 2007, Part 5 Noise and Vibration.	No. However, potential for more detailed measures; see Mitigation 14 outlined below.
Air Quality	Dust Mitigation measures to include suppression via watering of areas identified as potential dust source; road sweeping to remove aggregate materials; appropriate cover of transported materials; wheel washing; maintenance of public roads in relation to dust; and appropriate monitoring.	Yes – See Mitigation 1 and Mitigation 2 outlined below.

In addition, to ensure the OCEMP remains 'fit for purpose' for the duration of the project, it should be reviewed and updated by the Project Manager in consultation with the Contractor's Ecologist during the life of the project to ensure that it remains suitable to facilitate efficient and effective delivery of the project's environmental commitments. The Contractor shall also designate a Site Engineer/Manager/Assistant Manager as the Construction Waste Manager and who will have overall responsibility for the implementation of the Project Waste Management Plan (WMP). This Plan will be prepared upon appointment of the Main Contractor.

Additional mitigation measures required for sufficient of the Key Ecological Receptors (KERs) identified in Chapter 5 (Biodiversity), and/or details for the specific implementation of the mitigation measures as per Table 17-1 are given in the below sections.

Protection of Habitats

While best practice development standards have been included in the OCEMP for implementation, specific details are outlined within this section to ensure the sensitive

ecological receptors including the western drainage ditch and adjoining Triogue River, as well as the remaining cutover bog habitat and bog woodland habitat are not adversely impacted as a result. This will also protect fauna which could be impacted by deterioration of these habitats

Mitigation 1: General Dust Control Measures

Dust and fine particle generation during the site clearance, construction of the Temporary Construction Compound (TCC), widening of the road and associated works can be substantially reduced through the selection of adequate mitigation techniques and effective management. The most effective technique is to control dust at source and prevent it from becoming airborne by implementing the following mitigation measures:

- Excavated soils and vegetation during the site clearance works will be carefully managed and maintained in order to minimise potential effect on soil quality and soil structure;
- Handling of soils and materials will be undertaken in accordance with documented procedures outlined in the OCEMP that will be set out in order to protect ground and minimise airborne dust;
- The normal measures required to prevent airborne dust emissions and associated nuisance arising from site work will be in place, including measures to prevent uncovered soil drying out, leading to wind pick up of dust and mud being spread onto the local road network and adjoining properties;
- Vehicles travelling on any unsurfaced site roads shall have their speed restricted to 20 kph;
- Dust dispersal over the site boundary shall be minimised using methods as necessary; and
- The main contractor shall allocate suitably qualified personnel to be responsible for ensuring the generation of dust is minimised and effectively controlled.

Potential effects and avoidance and mitigation measures associated with generation of dust are addressed in Chapter 8 (Air Quality) of this EIAR in detail.

Mitigation 2: Dust Control – Site Roads and Trackout

While best practice development standards have been included in the OCEMP for implementation, specific details are outlined in this section to ensure the Triogue River and associated flora and fauna remain protected from inadvertent dust and silt deposition on the L217.

Site roads (particularly unpaved) can be a significant source of fugitive dust from construction sites if control measures are not in place. The most effective means of suppressing dust emissions from unpaved roads is to apply speed restrictions. Studies show that these measures can have a control efficiency ranging from 25-80%.

- A speed restriction of 20km/hr will be applied as an effective control measure for dust for on-site vehicles, in particular at site access/egress locations;
- Avoid dry sweeping of large areas;
- Vehicles entering and leaving the site will be covered to prevent escape of materials during transport;

- On-site haul routes will be regularly inspected by the Environmental Manager or appointed delegate for integrity and instigate necessary repairs to the surface as soon as reasonably practicable; and
- Dust suppression equipment must be used when point source emissions are likely.

Mitigation 3: Control and Management of Surface Water Runoff

While best practice development standards have been included in the OCEMP, further details are outlined in this section to ensure the ecology of the western drainage ditch and adjoining Triogue River, as well as the remaining cutover bog habitat and bog woodland habitat are not adversely impacted as a result. This will also protect fauna which could be impacted by deterioration of these habitats. With regards to protecting the retained drainage ditch and habitats, the following will be taken into consideration:

There will be no direct discharge to groundwater or surface water during the construction phase of the Proposed Development. The following mitigation measures will be adhered to during the construction phase of the Proposed Development:

- Silt fencing will be installed prior to the commencement of construction to ensure the protection of the onsite drainage ditches. Silt fencing will also be installed around the perimeter of the Site and silt traps placed in the drainage ditches to avoid sediment laden to migrate offsite to downgradient waterbodies;
- During the construction phase of the Proposed Development, measures would be adopted in order to prevent silt, chemicals and/or other contaminants from being washed into existing waterbodies (i.e., drainage ditches). Areas exposed due to the removal of vegetation are more susceptible to erosion during heavy rainfall, therefore, the areas would be reinstated as soon as possible to minimise this effect;
- Regular monitoring and prompt maintenance of the Sustainable Drainage Systems (SuDS) measures will ensure that the drainage system continues to function as designed:
 - Use of silt traps, silt fences and SuDS measures;
 - Exclusion zones between earthworks, stockpiles and temporary surfaces;
 - Temporary construction surface water drainage and sediment control measures installed prior to earthworks commencing;
 - Scheduling construction activities taking forecast weather conditions into consideration;
 - Silt ponds will be constructed on site as necessary to contain silt runoff;
 - An earth bund and silt fence will be constructed around the perimeter of the infill area. The earth bund and silt fencing will act as temporary sediment control devices to protect receiving watercourses from sediment and potential surface water runoff from the site. The fencing will be inspected twice daily based onsite and weather conditions for any signs of contamination or excessive silt deposits and records of these checks will be maintained; and
 - A 10m buffer and silt fence will be maintained along the western drainage ditch where no soil importation shall take place to protect surface waters and to ensure that there are no offsite nuisances created by the site.
- Stockpiles of loose materials pending reuse onsite will be protected for the duration of the works and not located in areas where sediment laden runoff may enter existing surface water drains.

- To help shed rainwater and prevent ponding and infiltration, the sides and top of the stockpiles will be regraded to form a smooth gradient with compacted sides reducing infiltration and silt runoff;
 - Where required, silt fences will be erected at the top of stockpiles to prevent runoff;
 - The silt fences will be monitored daily by the appointed contractor and silt will be removed as required;
 - Any materials excavated onsite during the construction works (i.e., construction phase) will be stored onsite close to the excavation location and reused where it is appropriate to do so during the operations phase. As such, offsite disposal of this material is not anticipated; and
 - Low mound stockpiles will be formed from excavated material away from open drains.
- A regular review of weather forecasts of heavy rainfall will be conducted, and a contingency plan will be prepared before and after such events to minimise any potential nuisances. As the risk of the break-out of silt-laden runoff is higher during these weather conditions, no work will be carried out during such periods where possible.

Mitigation 4: Management of Infilling of Drainage Ditches

The infilling of the existing drainage ditches onsite will be undertaken with cognisance to Construction Industry Research and Information Association (CIRIA), 2006. 'Control of Water Pollution from Linear Construction Projects: Technical guidance' (CIRIA C649) and 'Control of water pollution from construction sites. Guidance for consultants and contractors (C532)' and the following mitigation measures will be strictly adhered to:

- The infilling of existing drainage features including drainage ditches and bog drains will be completed in accordance with Series 600 of the Transport Infrastructure Ireland (TII) Specification for Road Works and the recommendations contained within the "NRA Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes";
- A 10-meter buffer and silt fence will be maintained along the western drainage ditch, where no vegetation clearance shall take place to protect surface waters and to ensure that there are no offsite nuisances created by the site;
- The existing drainage features (i.e., charted bog/field drains) will be cleared of vegetation and filled with clean washed CL6A material to TII specification. They will be maintained and upgraded to filter drains to maintain existing drainage flows;
- Before vegetation clearance commences, drainage runoff controls such as silt traps should be installed at the point where the site boundary intercepts any on-site drainage ditch along the northern or southern boundary. This should remain in-place for the duration of the construction phase;
- The installation of a 450mm diameter perforated pipe and permeable surround within the infill area will be applicable to all surface water drains onsite;
- All material placed into drainage features will be deposited by end tipping without compaction;
- The water will be allowed to flow through the existing drainage features at right angles in either direction;

- Runoff from the areas of exposed soil will be intercepted by a silt fence installed in advance of the drainage ditch;
- Any machines working in the vicinity of the drainage ditches will be protected against leakage or spillage of fuels, oils, greases and hydraulic fuels;
- Any displaced water during the infilling of the drainage ditches will be allowed to infiltrate to ground in the immediate surrounding area. Where required, drainage runoff controls such as silt fences and silt traps will be provided; and
- All trucks leaving the site will pass through a dry wheel wash, thereby removing the potential for transport of sediment offsite. The wheel wash will be periodically cleaned out and its contents will be disposed of in the appropriate manner by a suitably licensed waste contractor and never discharged onsite.

Mitigation 5: Construction Phase Surface Water Control for Aquatic Habitat

Silt fencing or bunding along the adjacent drainage ditches will be erected following the clearance of the site (i.e. vegetation clearance) with cognisance of Inland Fisheries Ireland (IFI) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters (IFI, 2016). The silt fencing will act in filtering any potential surface water runoff from the site generated during the proposed works and will be retained in place for the duration of the construction phase until the development is complete. The project specific OCEMP (which will be finalised by the Main Contractor in advance of construction works commencing) will identify how this silt curtain is to be installed and maintained throughout the construction phase.

The silt fences will be monitored to ensure that they remain functional throughout the construction of the Proposed Development. Where necessary, maintenance will be carried out on the fences to ensure that they continue to be effective. This will be particularly important after heavy rainfall events. The checks will be undertaken by the Environmental Manager. The frequency of monitoring will depend on the stage of works, and local environmental conditions. Daily checks may be appropriate during the initial site clearance, during works in the vicinity of the drainage ditches and during and after storm events. Weekly or bi-weekly checks may be appropriate at other times (i.e. during the operational phase).

All works carried out in or adjacent to the drainage ditches will adhere to the IFI Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters (IFI, 2016), the TII Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (TII, 2008) and CIRIA C648 Control of Water Pollution from Linear Construction Projects (CIRIA, 2006).

All near stream works will include the following measures:

- Silt fences and other sediment control measures will be utilised as required to prevent sedimentation in the drainage ditches; and
- Entry to the drainage ditches by vehicles beyond the silt fences will not be permitted, while vehicle usage along the banks will be restricted as much as practicable. Any machines working in close proximity of the watercourse must be protected against leakage or spillage of fuels, oils, greases and hydraulic fuels.

Additional measures to prevent impacts to watercourses can be found in Chapter 7 (Hydrology & Hydrogeology) of this EIAR.

Mitigation 6: Tree Retention and Protection

The Site plan provides for the retention of any trees present within a 1m boundary within perimeter of the site, as well as within the 10m buffer strip along the west of the site. Prior to commencement of construction at the site, all trees within these areas desired for retention will be protected by the use of protective barriers and/or ground protection, fit for the purpose of ensuring the successful long-term preservation of the trees.

Trees that are destined to be retained must be protected by protective fencing, signage and/or ground protection prior to any materials or machinery being brought on site and prior to any development, demolition or soil stripping takes place. Areas that are designated for new plantings should be similarly protected. Barriers should be fit for the purpose of excluding construction activity. In most cases barriers should consist of a scaffold framework comprising a vertical and horizontal framework, well braced to resist impacts. To ensure the protective barriers are respected, clear concise signage must be affixed to the barrier in an unrestricted easily viewed location. The protective barriers shall remain in an undisturbed condition and only removed on completion of all construction activity finished grading and sodding. Any breach of the protective fence shall be reported to the consulting arborist or ecologist (NRA, 2006).

During the course of the construction works the integrity of the fencing must be respected and remain in place at all times. No building materials or soil heaps are to be stored within this area. Should essential works need to take place within the root protection area, the project arborist must be informed in advance and any necessary mitigation measures are to be put in place. The protective fencing must remain in situ for the duration of the project and must only be removed upon completion of all works. Construction is only to commence once the protective barriers and/or ground protection have been erected (National Roads Authority (NRA), 2006).

Mitigation 7: Pre-Commencement Botanical Survey

Before construction works at the site commence, a botanical survey will be undertaken within the main botanical growing season between March and October (NRA 2009). This survey should consist of a systematic search and recording of any flora classified as invasive, rare or protected (e.g. under Annex V of the EU habitats directive). Depending on the findings of this survey, further mitigation as outlined within Mitigation 8, Mitigation 9 or Mitigation 22 may be required.

Mitigation 8: Rare or Protected Plant Species Management Plan

In the event that a protected plant species listed within Annex V of the EU Habitats Directive is identified during the pre-commencement botanical survey, commencement of construction will be placed on hold until a rare plant species management plan has been produced. This management plan will implement management and mitigation measures to prevent construction and operational phase impacts of the Proposed Development on such individual plants onsite.

The management and mitigation measures stipulated within this rare plant species management plan will be determined by the specific requirements and best practice management relevant to the specific species found. Management/mitigation measures may

involve translocation of the plant, or the isolation of the plant, and/or utilisation of protective dust and silt measures.

Mitigation 9: Invasive Species Management Plan (ISMP)

In the event of discovery of any high impact invasive species at the Site following any invasive species survey (such as those included within Mitigation 7 and Mitigation 22), commencement of construction would be placed on hold until an ISMP is developed. This would include a number of additional management and mitigation measures to avoid and minimise impacts of said invasive species. This ISMP would be informed by the results of the pre-commencement invasive species survey findings and by pest practice, and would include a number of additional management and mitigation measures to avoid and minimise impacts of said invasive species.

Mitigation 10: Biosecurity

The following best practice site hygiene and biosecurity measures will be in place to avoid the spread of invasive species within the site or into the surrounding areas during the construction phase:

- The Proposed Development will only accept inert Article 27 declared material which is clean, inert, greenfield soil and stone. This is therefore highly unlikely to contain invasive plant material, minimising the possibility of introduction of invasive plant materials to the site as far as possible;
- As a precautionary measure, a post infilling invasive species survey will be undertaken (see Mitigation 22);
- Personnel working on or between sites will ensure their clothing and footwear are cleaned, ensuring they are visually free from soil and organic debris, in order to prevent inadvertent spread of invasive plant material;
- Where possible tracked vehicles should not be used within an area of infestation;
- All vehicles leaving the site and/or transporting infested soil/materials must be thoroughly pressure-washed in a designated wash-down area before being used for other work. Mud and organic debris will not be allowed accumulate on tyres, wheels or under wheel arches;
- All vehicles containing invasive plant materials for transportation and disposal offsite will be suitably secured with tarpaulins etc., to ensure no inadvertent dissemination of invasive materials en-route;
- Works should be planned to avoid double handling of infected plants materials/soils as far as possible to reduce the risk of spread;
- All vehicles entering or leaving the site will have been suitably checked and pressure-washed to ensure no introduction of invasive flora to and from the site. Measures such as a drive through hygiene bath or footbaths will be considered where appropriate;
- Designated wash-down area to be located away from sensitive receptors such as watercourses, ditches, drains etc.;
- Material/water left after vehicles have been pressure-washed must be contained, collected and disposed of appropriately (these waters **must not** under any circumstances be discharged to drains or the eastern ditch); and
- All chemicals used for the control of non-native species should be stored and used in a responsible manner.

Protection of Fauna

Mitigation 11: Pre-Felling Check of Trees

It is recommended that a pre-felling check of all trees scheduled for removal is undertaken prior to the commencement of vegetation clearance, this is in order to confirm that bat roosting suitability has not changed since the last Site visit. This will include a visual inspection of on-site trees scheduled for removal for the presence of any Potential Roost Features (PRFs) within trees within or close to the site in adherence to best practice guidelines (Collins, 2016 and Marnell et al., 2022). Should any PRFs be identified, the appropriate additional roost surveys shall be implemented to determine use of the PRF and the National Parks and Wildlife Service (NPWS) approval obtained accordingly before construction commences.

As for protected small mammals, although no significant nesting hollows were noted as being present in trees at the site, it is recommended a pre-felling check should be undertaken prior to their removal, to confirm small mammal nesting suitability has not changed since the last Site visit. The protocol in the event of any nesting hollows or dreys will be dealt with as is above for PRFs.

Mitigation 12: Vegetation Clearance

As the site has been deemed suitable for bats, breeding birds (incl. the ground nesting meadow pipit), large mammals (Otter), small mammals (Irish hare, Pine Marten, Red Squirrel, Hedgehog, Irish Stoat, Pygmy Shrew), amphibians and Marsh Fritillary, vegetation clearance within the cutover bog, bog woodland and drainage ditch habitats will need to be cognisant of any potentially present fauna.

Table 17-2 provides guidance for when vegetation clearance is permissible in relation to wintering, hibernating and breeding fauna. Information sources include British Hedgehog Preservation Society's *Hedgehogs and Development* and *The Wildlife (Amendment) Act, 2000*.

The preferred period for vegetation clearance is within the months of September and October to avoid the main wintering and breeding bird seasons, amphibian breeding, as well as mammal hibernation.

Seasonal restrictions should be observed wherever possible, where this is not, an appropriate check for by an Ecological Clerk of Works (ECoW) for species likely to be present / breeding / hibernating at the time of works (e.g., winter to check for wintering birds, Feb-Jun check for breeding birds, amphibians, etc) and repeated as required to ensure compliance with legislative requirements.

Each target species requires a different approach if found during ECoW works. Where the ECoW determines that the impact is too high on any of the target species should works continue, the works will be halted and the NPWS and the Local County Council (LCC) Biodiversity Officer will be consulted on the best approach to proceed.

Table 17-2. Seasonal Restrictions on Vegetation Removal. Red boxes indicate periods when clearance/works are not advised.

Ecological Feature	January	February	March	April	May	June	July	August	September	October	November	December	
Breeding Birds	Vegetation clearance permissible		Nesting bird season No clearance of vegetation or works to relevant structures permitted unless confirmed to be devoid of nesting birds by an ecologist.						Vegetation clearance permissible				
Wintering Birds	Wintering Bird Season			Vegetation clearance permissible					Beginning of Wintering Bird Season- Vegetation clearance permissible under supervision of an ecologist.		Wintering Bird Season		
Hibernating mammals (namely hedgehog)	Mammal hibernation season No clearance of vegetation or works to relevant structures permitted unless confirmed to be devoid of hibernating mammals by an ecologist.			Vegetation clearance permissible							Mammal hibernation season No clearance of vegetation or works to relevant structures permitted unless confirmed to be devoid of hibernating mammals by an ecologist.		
Amphibians (namely common frog)		Common Frog breeding season							Vegetation / Site clearance permissible				
Marsh Fritillary (Devils bit Scabious habitat removal)	Out of adult flight season				Vegetation clearance permissible		Out of adult flight season						

Additionally, all vegetation clearance will be carried out in sections working in a consistent direction to prevent entrapment of protected fauna potentially present (e.g., hedgehog, pygmy shrew, common frog). A phased cutting approach under the supervision of a suitably qualified ECoW will be used to allow wildlife (small mammals, amphibians and reptiles) to move away from any suitable habitat that will be removed. This will take place during weather that is suitable for reptiles to be active (above 10°C with little rain):

- Phase 1 – Cutting vegetation to 150-200mm and removing the arisings;

- Phase 2 – After a minimum of one hour, hand-searching the cut areas (conducted by an ECoW) and removing any sheltering habitat (e.g. logs or debris) then cutting vegetation to ground level and removing the arisings; and
- Phase 3 – Soil scrape.

Should any suitable refugia or day nesting habitats need to be removed, this will be carried out outside the most vulnerable breeding periods for the relevant species and will be supervised by the ECoW.

Mitigation 13: Wildlife Friendly Lighting

No overnight lighting will be directed to the remaining onsite and offsite natural habitats along the north, south, east or west boundary (i.e., the western ditch, the western 10m buffer and the boarder habitat around the perimeter of the site). Where overnight lighting cannot be avoided in these areas due to health and safety concerns, the lighting within the Proposed Development will be designed and installed to minimise the impact on local wildlife and in accordance with the Bat Conservation Trust (BCT) guidelines on artificial lighting and bats (BCT 2023):

- There will be no light spill to the boundary habitats;
- All luminaries used will lack UV/IR elements to reduce impact;
- LED luminaries will be used due to the fact that they are highly directional, lower intensity, good colour rendition and dimming capability;
- A warm white spectrum (<2700 Kelvins will be used to reduce the blue light component of the LED spectrum);
- Luminaries will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats;
- Column heights should be carefully considered to minimise light spill. The shortest column height allowed should be used where possible;
- Only luminaries with an upward light ratio of 0% and with good optical control will be used;
- Luminaries will be mounted on the horizontal, i.e. no upward tilt;
- Any external security lighting will be set on motion-sensors and short (1 minute) timers; and;
- As a last resort, accessories such as baffles, hoods or louvres will be used to reduce light spill and direct it only to where it is needed.

Mitigation 14: Pre-Commencement Mammal Survey

Prior to the commencement of the works, an updated mammal walkover survey will be completed. This will include a focused search for Otter Holts on-site. Should either feature be identified, the NPWS and the relevant Biodiversity Officer will be consulted to agree an Otter Mitigation Plan for the duration of the construction and operational phases. This plan may include additional measures for monitoring and mitigating habitat loss, noise and disturbance impacts.

Mitigation 15: Wildlife Conscious Waste and Site Housekeeping

To prevent entrapment of small mammals and amphibians in any newly dug trenches, pits or other excavations (e.g. SuDS manhole excavations), any areas excavated will be refilled prior

to end of working day or finished with a low slope on one aspect to allow fauna to escape should they fall in during non-working hours (e.g. at night). Alternatively, the excavations may be covered with a sturdy impermeable cover that will not move should a larger animal step on it.

As best-practice, all construction-related rubbish on-site e.g., plastic sheeting, netting etc. should be kept in a designated area on-site and kept off ground level so as to protect small fauna (such as small mammals, amphibians and reptiles) from entrapment and death.

Mitigation 16: Pre-Construction Amphibian Check

Given the proposed removal of suitable Amphibian habitat within the site, a check of all drainage ditches scheduled for removal will be undertaken immediately before vegetation clearance takes place.

A precautionary survey will be carried out by the ECoW to ensure that no breeding frogs or other amphibians are present prior to the initiation of clearance and drainage ditch filling works. In the event that amphibians (of any life stage) are detected, they will be captured and transferred carefully to a “safe zone” by the ECoW under best practice guidance consulting relevant authorities as required, before any further vegetation clearance or ditch filling commences.

General amphibian protection measures are as follows:

- Institute and adhere to a code of best practice when operating in the areas in and around the drainage ditches onsite;
- Retain a suitably qualified and licenced ECoW during the construction phase to check for amphibians before clearance of small sections; and
- Work from one end to another with controlled removal of the scrub areas and hedgerows i.e., sequentially rather than all at once.

Mitigation 17: Pre-Commencement Marsh Fritillary Surveys

A habitat condition survey and larval web survey will be undertaken in early September to determine the presence of Marsh Fritillary at the site. This is when both Devils Bit Scabious and larval webs are most conspicuous. The surveys should be undertaken pre-construction by a suitably qualified ecologist in line best practice survey methodology outlined by the NRA and National Biodiversity Data Centre (NBDC) (NRA, 2009; NBDCa, 2026).

The purpose of these surveys is to understand the presence of this species on-site, and/ or to determine how the Site is used by the species should it be present. Areas of any category of suitable habitat or any signs of larval webs will be mapped and presented to the NPWS. As Marsh Fritillary typically live in metapopulations, one main population supported by smaller subpopulations, periods of local extinctions of subpopulations can occur due to temporary factors, and it is important during these extinction events that habitat quality is maintained so the Marsh Fritillary can recolonise the area when populations increase again. If during these periodic extinctions the habitat quality becomes unsuitable, the Marsh Fritillary will not recolonise the area. As such, suitable but currently unoccupied habitat near to recorded existing populations will be mapped and considered to be of significance to local populations.

The outcome of all surveys will be communicated with the NPWS and commencement of construction will begin only once this entity has been consulted on the results and a relevant

Marsh Fritillary License has been obtained if so required. It may be necessary to undertake an adult Marsh Fritillary survey during late-May or early June when adult butterflies are on the wing (NRA, 2009; NBDCa, 2026), or, if the habitat condition surveys determine suitable habitat for this species is present on-site, engage in avoidance activities which exclude the plants from the infilling activities to maintain habitat quality for returning populations.

17.2.2.1.2 Monitoring

A suitably qualified ECoW will be employed before commencement and for the duration of the construction phase; to provide ecological advice and input to the construction team. The ECoW will carry out the monitoring activities listed above for the duration of the construction phase of the Proposed Development. Details of all species-specific monitoring both pre-, during and post-construction, will be provided to the County Council for their records:

NOTE: The ECoW will be employed several weeks before commencement of works on site; to allow time for the scope of ECoW works to be reviewed by the ecologist and any necessary pre-construction surveys to be carried out.

All surveys, site inspections and supervised works requirements outlined within the mitigation measures outlined within this chapter will be incorporated into a Mitigation and Management Plan. This plan will lay out the responsibilities of the Site Manager and ECoW throughout the construction phase of the Proposed Development.

Table 17-3 provides a summary of the required monitoring and pre-works inspections during the construction phase of the Proposed Development. The monitoring, inspections and surveys will ensure that the identified mitigation measures are implemented and maintained efficiently and have the desired effect of protecting the local ecology from adverse impacts.

Table 17-3. Monitoring and Pre-Works Inspections for Identified Mitigation Measures during the Construction Phase. To be carried out by a suitably qualified EcOW (highlighted) or by the development Contractor (no highlight).

Measure	Monitoring
CONSTRUCTION PHASE	
Mitigation 1: General Dust Control Measures	Ongoing monitoring by contractor.
Mitigation 2: Dust Control – Site Roads and Track Out	Ongoing monitoring by contractor.
Mitigation 3: Control & Management of Surface Water Runoff	Ongoing monitoring by contractor.
Mitigation 4: Management Infilling of Drainage Ditches	Ongoing monitoring by contractor and ECoW
Mitigation 5: Construction Phase Surface Water Control for Adjacent Habitats	Ongoing monitoring by contractor and ECoW
Mitigation 6: Tree retention & Protection	Confirmed with ECoW. Monitored by contractor.
Mitigation 7: Pre-commencement Botanical Survey	Undertaken by ECoW
Mitigation 8: Rare or Protected Plant Species Management Plan	Implementation overseen by ECoW if required
Mitigation 9: Invasive Species Management Plan	Implementation overseen by ECoW if required
Mitigation 10: Biosecurity	Ongoing monitoring by contractor.
Mitigation 11: Pre-felling check of trees	Undertaken by ECoW
Mitigation 12: Vegetation Clearance	ECoW will be present throughout vegetation clearance activities and carry out necessary checks.
Mitigation 13: Wildlife Friendly Lighting	Plan to be reviewed by ECoW. Implemented and monitored by contractor
Mitigation 14: Pre-commencement Mammal Survey	Undertaken by ECoW
Mitigation 15: Wildlife Conscious Waste & Site Housekeeping Measures	Ongoing monitoring by contractor.
Mitigation 16: Pre-construction Amphibian Check	Undertaken by ECoW
Mitigation 17: Pre-commencement Marsh Fritillary Surveys	Undertaken by ECoW

17.2.2.2 Operational Phase

17.2.2.2.1 Mitigation

Given the similarities between the construction and operational phase of the Proposed Development, many of the mitigation measures outlined for the construction phase will continue to apply, where relevant, during the operational phase of the Proposed Development. Mitigation measures which require no change and can be carried forward include:

- Mitigation 1: General Dust Control Measures;
- Mitigation 2: Dust Control – Site Roads and Trackout;
- Mitigation 3: Control and Management of Surface Water Runoff;
- Mitigation 6: Tree Retention and Protection;
- Mitigation 10: Biosecurity;
- Mitigation 13: Wildlife Friendly Lighting; and
- Mitigation 15: Wildlife Conscious Waste and Site Housekeeping.

All further mitigation measures laid out below are modified or additional mitigation measures which will be implemented for the operational phase of the Proposed Development.

Protection of Habitats

Mitigation 18: Operational Phase Dust Screening

Adequate dust/debris screening will be in place at the site boundary to contain and minimise the amount of windblown dust. This will be maintained in good condition at all times. This will include:

- Erection of solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiled materials on site; and
- Full enclosure of specific operations where there is a high potential for dust production and the site is active for an extensive period.
- Dust suppression equipment must be used when point source emissions are likely. The site will be dampened down as necessary to minimise windblown dust when necessary or during periods of dry weather. Where dust is likely to be a persistent problem a water spray system (e.g., IBC tanks fitted with hoses, bowsers fitted with spray nozzles) will be put in place from the commencement of the works where required. Hard to reach areas will be kept wet by the use of water cannons fitted to the rear of the bowsers;
- Avoid site runoff of water or mud;
- Keep site fencing, barriers and scaffolding clean using wet methods;
- Netting of scaffolding will be undertaken as required;
- Covering skips and slack heaps; and
- Remove materials that have a potential to produce dust from site as soon as possible.

Mitigation 19: Operational Surface Water Control for Adjacent Habitats

In order to provide specific protection to the adjacent, hydrologically linked drainage ditches to the site, the following measures will be observed throughout construction:

- Silt fences along drainage ditches will remain in place throughout the operational phase;
- Western most drainage ditch:
 - A 10-meter buffer and silt fence will be maintained along the western drainage ditch, where no soil deposition shall take place to protect surface waters and to ensure that there are no offsite nuisances created by the site.
- Adjacent drainage ditch habitat to infilling activities:
 - Any displaced water during the infilling of the drainage ditches will be allowed to infiltrate to ground in the immediate surrounding area. In-ditch drainage runoff controls such as silt fences and traps at the point where the site boundary intercepts any drainage ditch along the northern or southern boundary should remain in-place for the duration of the operational phase. Where required, drainage runoff controls such as silt fences and silt traps and additional such devices will be provided where required;
 - Buffer zones silt fencing or bunding along the length of the open drainage ditches during the construction phase will be maintained on-Site until the point of infill of the drainage ditch, at which point careful removal shall be undertaken. This is to prevent the silting and compaction of the filter materials within the drainage ditch which in turn will help maintain the outflow of water to adjacent ditch habitats;
 - Following careful removal of the silt fencing along these drainage ditches, vehicle restrictions within this buffer will remain observed, and all material placed atop of the infilled drainage features shall be deposited by end tipping without compaction;
 - Any machines working in the vicinity of the drainage ditches will continue to be protected against leakage or spillage of fuels, oils, greases and hydraulic fuels;
 - All trucks leaving the site will pass through a dry wheel wash, thereby removing the potential for transport of sediment offsite. The wheel wash will be periodically cleaned out and its contents will be disposed of in the appropriate manner by a suitably licensed waste contractor and never discharged onsite;
 - The silt fences around the periphery of the infilling area will also be retained throughout the duration for the operational phase in order to continue to protect adjacent habitats including the drainage ditches and cutover bog and bog woodland habitat; and
 - No planting of trees during re-naturalisation of the Site should occur over the drainage ditches, as to avoid compaction of soil and subsequent impact to flow to adjacent drainage ditch habitat.

All silt fences will continue to be monitored to ensure that they remain functional throughout. Where necessary, maintenance will be carried out on the fences to ensure that they continue to be effective. This will be particularly important after heavy rainfall events. The checks will be undertaken by the Environmental Manager. The frequency of monitoring will depend on the stage of works, and local environmental conditions. Daily checks may be appropriate during the initial site clearance, during works in the vicinity of the drainage ditches and during and after storm events. Weekly or bi-weekly checks may be appropriate at other times.

Upon completion of the operational phase, all silt fences remaining will be carefully removed. All works carried out in or adjacent to the drainage ditches will adhere to the IFI Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters (IFI, 2016), the TII Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (TII, 2008) and CIRIA C648 Control of Water Pollution from Linear Construction Projects (CIRIA, 2006).

All near stream works will include the following measures:

- Silt fences and other sediment control measures will be utilised as required to prevent sedimentation in the drainage ditches;
- Entry to the drainage ditches by vehicles beyond the silt fences will not be permitted, while vehicle usage along the banks will be restricted as much as practicable. Any machines working in close proximity of the watercourse must be protected against leakage or spillage of fuels, oils, greases and hydraulic fluids; and
- Works will be carried out from the bank side, as best practice in-stream works will be restricted to the period 1st July through 30th September, to comply with the seasonal restrictions in salmonid rivers.

Protection of Fauna

Mitigation 20: Amphibian Notification Protocol

In the event that Amphibian individuals or signs of such species are identified within any areas of pooling water on-site, the NPWS and the relevant Biodiversity Officer will be contacted and a translocation of the Species in line with best practice measures will be arranged before infilling activities within range continue.

Mitigation 21: Annual Marsh Fritillary Surveys of Lands to be Infilled

Annual habitat suitability surveys, larval web surveys and adult surveys for Marsh Fritillary will continue to occur throughout the duration of the operational phase (see methodology requirements in Mitigation 17) as fluctuating populations may return to utilise suitable habitats on Site. NPWS will be engaged throughout this process.

In the event of observations of new Devils Bit Scabious individuals or Marsh Fritillary individuals on-Site, the NPWS and the relevant Biodiversity Officer will be re-contacted, and infilling will be placed on hold until these entities have been consulted on the best approach to proceed.

Additional mitigation or enhancement measures may also be required based off of the pre-construction phase consultations with the NPWS.

Mitigation 22: Annual Botanical Survey of Lands to be Infilled

Annual botanical surveys of lands to be infilled following the year in which construction is undertaken will be conducted. This will be undertaken within the main botanical growing season between March and October (NRA 2009) and will consist of a systematic search and recording of any flora classified as invasive, rare or protected (e.g. under Annex V of the EU habitats directive). Depending on the findings of this survey, further mitigation as outlined within Mitigation 8 or Mitigation 9 may be required for the remainder of the operational phase.

Biodiversity Enhancement Measures – Biodiversity Enhancement by Design

Following the infilling the site will be reseeded with a native grassland meadow mix. Left to grow, flower and form tussocks this grassland habitat will provide pollinator foraging habitat as well as ample nesting grounds for small mammal which in turn will increase prey and foraging area for Pine Marten. It will also provide suitable habitat for ground nesting and wintering birds including meadow pipit and wintering snipe through the provision of grass tussocks. This habitat type will also provide commuting ground for mammals including otter to traverse the site and reach surrounding drainage ditches.

The design of the Proposed Development also includes for the planting of scrub and native tree cuttings, sourced from vegetation clearance, to be scattered around the perimeter of the Site at a depth of 5m to enhance the native woodland cover following infilling. The offcut boughs/branches/stumps of onsite material will be placed along the Site periphery and will undergo semi covering with c. 150mm of topsoil. These cuttings will include willow and birch species which are prone hardwood propagation in this environment. This will provide small mammals with sheltering and nesting habitat as above and provide nesting for breeding birds.

Enhancement 1: Bat Boxes

Two summer bat boxes (e.g., Woodcrete 1FF design) will be erected on suitably sized trees within the retained treelines, with one to be placed at the western boundary buffer strip of the Proposed Development site, and the other within the northern treeline; the exact placement of which will be determined by the ECoW.

Bat boxes will be sited carefully, and this will be undertaken by a bat specialist. Bat boxes will be erected prior to construction works. The bat ecologist will erect the bat boxes with assistance from the contractor. Some general points that will be followed include:

- Bat boxes will be erected on trees (or telegraph poles) with no crowding branches or other obstructions for at least 1 metre above and below the bat box;
- Diameter of tree should be wide and strong enough to hold the required number of boxes;
- Locate bat boxes in areas where bats are known to forage or adjacent to suitable foraging areas. Locations will be sheltered from prevailing winds; and
- Bat boxes will be erected at a height of 4-5 metres to reduce the potential for vandalism and predation of roosting bats.

The recommended Woodcrete 1FF design is open at the bottom, allowing the droppings to fall out, and so does not need cleaning.

Enhancement 2: Additional Planting of Native Trees

An area within the west of the Site adjacent to the retained buffer will be planted with a number of Scots Pine and other native tree species such as silver birch (*Betula pendula*) and willow (*Salix Sp.*). The final planting schedule will be added to the proposed mitigations and management plan by the ECoW. Planting of this species of tree will eventually provide resting and nesting habitat for Pine Marten and Squirrel.

Enhancement 3: Pine Marten Nesting Box

A Pine Marten Nesting Box will be placed under guidance of the ECoW for the Site. The box will be The box will be sited 4m high on a mature tree within the bog woodland remaining on

the periphery of the Site. Trees for attaching boxes should be selected carefully to minimise the risk of interference or disturbance. Only trees along the northeastern and western boundary away and out of sight of public roads or footpaths and away from areas targeted for woodland management or harvesting in the near future (Vincent Wildlife Trust, 2014).

Enhancement 4: Red Squirrel Nest Box

A red squirrel nest box will be placed under the guidance of the ECoW for the Site. The box will be sited between 3m-4m high on a mature tree within the bog woodland remaining on the periphery of the site. The box should be facing away from both direct sunlight and prevailing weather and be half filled with dehydrated nesting material such as leaves, straw or hay (TIG, 2026).

Supporting and encouraging Red Squirrel to Site will increase the prey species available for Pine Marten, which, as discussed may not be using the Site but have been recorded within the area. Supporting Red Squirrel on-site may also encourage the regrowth of native trees, as their presence on-site will increase active hoarding and incidental growth of tree seeds over large areas. This, in turn, will provide additional foraging, nesting and resting habitat for protected small mammals within the area such as Pine Marten and Red Squirrel.

17.2.2.2 Monitoring

A suitably qualified ECoW will be employed before commencement and for the duration of the construction phase. The ECoW will carry out the monitoring activities listed above for the duration of the operational Phase of the Proposed Development. Details of all species-specific monitoring both pre-, during and post-construction, will be provided to the County Council for their records:

NOTE: The ECoW will be employed several weeks before commencement of works on site; to allow time for the scope of ECoW works to be reviewed by the ecologist and any necessary pre-construction surveys to be carried out.

All surveys, site inspections and supervised works requirements outlined within the mitigation measures outlined within this chapter will be incorporated into a Mitigation and Management Plan. This plan will lay out the responsibilities of the Site Manager and ECoW throughout the operational phase of the Proposed Development.

Table 17-4 provides a summary of the required monitoring and pre-works inspections during the operational phase of the Proposed Development. The monitoring, inspections and surveys will ensure that the identified mitigation measures are implemented and maintained efficiently and have the desired effect of protecting the local ecology from adverse impacts.

Table 17-4. Monitoring and Pre-Works Inspections for the Identified Mitigation Measures during the Operational Phase. To be carried out by a suitably qualified ECoW (highlighted) or by the development Contractor (no highlight)

Measure	Monitoring
OPERATIONAL PHASE	
Mitigation 1: General Dust control measures	Ongoing monitoring by contractor.
Mitigation 2: Dust Control – Site Roads and Track Out	Ongoing monitoring by contractor.
Mitigation 3: Control & Management of Surface Water Runoff	Ongoing monitoring by contractor.
Mitigation 6: Tree retention & Protection	Confirmed with ECoW. Monitored by contractor.
Mitigation 10: Biosecurity	Ongoing monitoring by contractor.
Mitigation 13: Wildlife Friendly Lighting	Plan to be reviewed by ECoW. Implemented and monitored by contractor
Mitigation 19: Operational Surface Water Control for Adjacent Habitats	Ongoing monitoring by contractor and ECoW
Mitigation 20: Amphibian Notification Protocol	Sporadic checks by ECoW
Mitigation 21: Annual Marsh Fritillary Surveys of Lands to be Infilled	Undertaken by ECoW
Mitigation 22: Annual Botanical Surveys of Lands to be Infilled	Undertaken by ECoW
Enhancement 1: Bat Boxes	The placement and construction of these structures should be carried out under supervision of an ECoW to ensure they are fit for purpose.
Enhancement 2: Additional Planting of Native Trees	Confirmed with ECoW.
Enhancement 3: Pine Marten Nesting Box	The placement and construction of these structures should be carried out under supervision of an ECoW to ensure they are fit for purpose.
Enhancement 4: Red Squirrel Nesting Box	The placement and construction of these structures should be carried out under supervision of an ECoW to ensure they are fit for purpose.
Enhancement 5: Planting of Devils Bit Scabious	The placement and construction of these plants should be carried out under supervision of an ECoW to ensure they are planted within suitable conditions to survive and support Marsh Fritillary.

17.2.3 Land and Soils

17.2.3.1 Construction Phase

17.2.3.1.1 Mitigation

During the construction phase, all works will be undertaken in accordance with the OCEMP (Lenztech, 2023) and the Resource and Waste Management Plan (RWMP) (DNV, 2026; submitted with the planning application under separate cover). Following appointment, the contractor will be required to further develop the CEMP and RWMP to provide detailed construction phasing and methods to manage and prevent any potential emissions to ground and surface water with regard to the relevant industry standards (e.g., Guidance for Consultants and Contractors, CIRIA-C532', CIRIA, 2001). The OCEMP and RWMP will be implemented for the duration of the construction phase, covering construction and waste management activities that will take place during the construction phase of the Proposed Development.

Mitigation works will be adopted as part of the construction works for the Proposed Development. These measures will address the main activities of potential impact, which include:

- Management and Control Procedures for the Importation of Aggregates and Materials;
- Control and Management of Soils, Subsoils and Stockpiles;
- Management and Control for the Reuse of Soil;
- Management and Control of Surplus Materials;
- Control and Handling of Fuel and Hazardous Materials;
- Accidental Release of Contaminants; and
- Appropriate Fuel and Chemical Handling, Transport and Storage.

Import of Aggregates and Materials

There will be limited quantities of aggregates imported to the site during the construction phase of the Proposed Development. However, contract and procurement procedures will ensure that all imported aggregates and materials required for the construction phase of the Proposed Development will be sourced from reputable suppliers operating in a sustainable manner and in accordance with industry conformity/compliance standards and statutory obligations.

The importation of aggregates and materials will be subject to management and control procedures which will include testing for contaminants, invasive species and other anthropogenic inclusions and assessment of the suitability for use in accordance with engineering and environmental specifications for the Proposed Development. As a result, any unsuitable material will be identified prior to unloading / placement onsite, thereby ensuring environmental protection and compliance with regulatory requirements.

Airborne Dust Generation

Dust and fine particle generation during the site clearance, construction of the Temporary Construction Compound (TCC), widening of the road and associated works can be substantially reduced through the selection of adequate mitigation techniques and

effective management. The most effective technique is to control dust at source and prevent it from becoming airborne by implementing the following mitigation measures:

- Excavated soils and vegetation during the site clearance works will be carefully managed and maintained in order to minimise potential effect on soil quality and soil structure;
- Handling of soils and materials will be undertaken in accordance with documented procedures outlined in the OCEMP and RWMP that will be set out in order to protect ground and minimise airborne dust;
- The normal measures required to prevent airborne dust emissions and associated nuisance arising from site work will be in place, including measures to prevent uncovered soil drying out, leading to wind pick up of dust and mud being spread onto the local road network and adjoining properties;
- Vehicles travelling on any unsurfaced site roads shall have their speed restricted to 20 kph;
- Dust dispersal over the site boundary shall be minimised using watering methods as necessary; and
- The main contractor shall allocate suitably qualified personnel to be responsible for ensuring the generation of dust is minimised and effectively controlled.

Potential effects and avoidance and mitigation measures associated with generation of dust are addressed in Chapter 8 (Air Quality) of this EIAR.

Reuse of Soil

There will be limited excavations at the site during the construction phase. However, it is expected that the excavated material will be reused onsite as part of the infilling works (i.e., operational phase).

- All topsoil stripping associated with the Proposed Development will be monitored by a suitably qualified consultant;
- Excavated soil that is not suitable for reuse will be removed from the site by a suitable contractor licensed under the Waste Management Act 1996 and relevant regulations; and
- Any soil reused onsite will be monitored for the occurrence of invasive plant species with follow up treatment.

Management and Control of Soils and Stockpiles

Segregation and storage of soils for reuse onsite or removal offsite and material for disposal offsite (i.e., vegetation during the site clearance) will be segregated and temporarily stored onsite pending removal or for reuse in accordance with the OCEMP (Lenztech, 2023), which will be prepared by the main contractor in advance of construction works commencing.

Stockpiled materials, pending reuse onsite, will be located away from the location of any sensitive receptors (i.e., drains / watercourses). An excavation/stockpile register will be maintained onsite.

The reuse of suitable excavated soil and subsoil for the Proposed Development will be undertaken in accordance with the final recontouring design for the Proposed Development.

Stockpiling of excavated material (i.e., soils and subsoils), where required (i.e. awaiting reuse onsite or removal offsite), will be appropriately managed onsite during the construction phase of the Proposed Development in accordance with the measures outlined in the OCEMP (Lenztech, 2023). To minimise the overall effect on soils arising during the construction works, the following mitigation measures will be adhered to:

- A suitable temporary storage area will be identified and designated;
- All stockpiles will be assigned a stockpile number;
- Material identified for reuse onsite, offsite and waste materials will be individually segregated; and all segregation, storage & stockpiling locations will be clearly delineated on the site drawings;
- Soil stockpiles will be covered to prevent runoff from the stockpiled material generation and/or the generation of dust;
- Topsoil should not be stored in piles of greater than two metres in height as the soil matrix (internal structure) can be damaged beyond repair. It should also be kept as dry as possible and used as soon as possible to reduce any deterioration through lengthy storage and excess moving around the site;
- Any waste that will be temporarily stored / stockpiled will be stored on impermeable surface high-grade polythene sheeting, hardstand areas or skips to prevent cross-contamination of the soil below or cross-contamination with soil;
- Regular watering will take place to ensure the moisture content is high enough to increase the stability of the soil and thus suppress dust; and
- Stockpiles of materials shall be kept to a minimum and if necessary, they shall be kept away from sensitive receptors.

Soil Structure

The extent of the required work area at the site will be minimised where appropriate to prevent unnecessary excavation of soil and tracking over soil, subsoil and vegetation outside of the excavation work areas and site clearance areas as a result of compaction and rutting from construction traffic.

Soil including topsoil and subsoil will be segregated and stored appropriately to prevent deterioration of soil structure and quality to ensure the material will be suitable for reuse onsite.

Export of Resource (Soil and Subsoil) and Waste

Surplus materials will be removed offsite, if required, in accordance with the requirements outlined in the OCEMP (Lenztech, 2023) and the RWMP (DNV, 2026b) and will be managed in accordance with all legal obligations.

It will be the contractor's responsibility to either; obtain a waste collection permit or, to engage specialist waste service contractors who will possess the requisite authorisations, for the collection and movement of waste offsite.

The removal of soil offsite, if required, will be undertaken in accordance with all statutory requirements and obligations including, where appropriate, reuse as by-product in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011 (SI No. 126 of 2011) as amended. Any surplus material not suitable for reuse as a by-product and other waste materials arising from the construction phase will be removed offsite by an

authorised contractor and sent to the appropriately authorised receiving facility. As only authorised facilities will be used, the potential effects at any authorised receiving facility sites will have been adequately assessed and mitigated as part of the statutory consent procedures.

Any excess material will be documented prior to leaving the site. All information will be entered into a waste management register kept on the site.

Vehicles transporting material with potential for dust emissions to an offsite location shall be enclosed or covered with a tarpaulin at all times to restrict the escape of dust.

Public roads outside the site will be regularly inspected for cleanliness, as a minimum on a daily basis, and cleaned as necessary. Where required, trucks entering / leaving the site will pass through a dry wheel washing system. The wheels of all lorries will be cleaned as required prior to leaving the site to prevent the generation of dust or cause the build-up of aggregates and fine material in the public domain. The correct use and management of the wheel washing system (where required) will be undertaken by the main contractor to ensure that there is no harm or effect to the receiving water environment.

Handling of Fuels, Chemicals and Materials

Fuelling and lubrication of equipment will be carried out in accordance with the procedures outlined in the OCEMP (Lenztech, 2023), in a designated area of the site (i.e., bunded areas within the site compound only) away from any watercourses and drains (where not possible to carry out such activities offsite) with full attendance of plant operatives.

Fuel will not be stored onsite for the duration of the construction phase. Fuel will only be brought to site via mobile fuel bowser. Any other oils or hydraulic oils stored onsite will be stored in designated areas in suitable tanks and containers. These areas will be bunded and located away from surface water drainage and features (i.e., bunded compounds at the Contractor's compound on flat ground or at a location at least 50m from any watercourse or other water conducting features).

- All other fuels, oils and potential contaminants, as well as waste oils, will be stored within the site compound in secure, fit for purpose containers within bunded containment as appropriate and in accordance CIRIA guidance documents (Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors-2001, Environmental Good Practice on Site-C650), Environmental Protection Agency (EPA) "IPC Guidance Note on Storage and transfer of Materials for Scheduled Activities" and with SEPA guidance (GPP 2: Above ground oil storage tanks, January 2018);
- Bunds will have regard to Environmental Protection Agency Guidelines 'Amendment to IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities' (EPA, 2013). All tank and drum storage areas will, as a minimum, be bunded to a volume not less than the greater of the following:
 - 110% of the capacity of the largest tank or drum within the bunded area; or
 - 25% of the total volume of substance that could be stored within the bunded area.
- Vehicle refuelling will take place either within the compound at a dedicated impermeable refuelling pad or by mobile double bunded bowzers at their place of work;
- The refuelling pad would be bunded and equipped with a collection sump;

- Suitable bunded areas will be installed for oil and petrol storage tanks;
- Refuelling would be carried out using an approved mobile fuel bowser with a suitable pump and hose;
- Designated fuel filling points will be put in place with appropriate oil and petrol interceptors to provide protection from accidental spills;
- No refuelling is permitted on site, i.e. within the river or adjacent due to risk of spillage;
- Absorbent material (spill kits) would be available onsite and would be deployed to contain drips and small spillages;
- Maintenance of mobile plant will take place within the construction compounds only and would comply with CIRIA guidance documents and SEPA PPG 7 (The safe operation of refuelling facilities, July 2011);
- Only emergency breakdown maintenance will be carried out onsite;
- Strict supervision of contractors will be adhered to in order to ensure that all plant and equipment utilised onsite is in good working condition;
- Any equipment not meeting the required standard will not be permitted for use within the Proposed Development site;
- Drip trays and spill kits will be available onsite to ensure that any spills from vehicles are contained and removed offsite;
- Spill kits will be made available and kept onsite at all times and identified with signage for use in the event of an environmental spill or leak;
- A spill kit will be kept in close proximity to the fuel storage area for use in the event of any incident during refuelling or maintenance works;
- Spill kits will be provided by the main contractor to cater for any other spills;
- Method statements for dealing with accidental spillages will be provided the Contractor for review by the Employer's Representative;
- There may also be the requirement for use of portable generators or similar fuel containing equipment during the construction phase of the Proposed Development, which will be placed on suitable drip trays. Regular monitoring of drip tray content will be undertaken to ensure sufficient capacity is maintained at all times; and
- The local authority will be informed immediately of any spillage or pollution incident that may occur onsite during the construction phase.

Emergency Procedures

Emergency procedures will be developed by the appointed contractor in advance of works commencing and spillage kits will be available onsite including in vehicles operating onsite. Remedial action will be immediately implemented to address any potential effects in accordance with industry standards and legislative requirements, which will ensure minimal risk to the receiving hydrological and hydrogeological environment associated with the construction phase of the Proposed Development. The following mitigation measures will be adhered to as follows:

- Any required emergency vehicle or equipment maintenance work will take place in a designated impermeable area within the Proposed Development site;
- Emergency response procedures and contingency plans will be put in place, in the unlikely event of emergency accidents (i.e., spillages of fuels or lubricants);

- Spill kits, including oil absorbent material, will be provided and available onsite, so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained;
- In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the Proposed Development site and compliantly disposed offsite. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures, standards and EPA guidelines;
- All site staff (i.e., construction staff) staff will be familiar with the emergency procedures in the event of accidental fuel spillages; and
- All construction works staff onsite will be fully trained on the use of equipment.

This procedure will be undertaken in accordance with industry best practice procedures and standards. These measures will ensure that there is minimal risk to the receiving land, soil and geology associated with the construction stage of the Proposed Development.

Welfare Facilities

Welfare facilities have the potential, if not managed appropriately, to release organic and other contaminants to ground or surface water courses. Foul drainage from temporary welfare facilities during the construction phase of the Proposed Development will be discharged to temporary holding tank(s) the contents of which will periodically be tankered offsite to a licensed facility. All waste from welfare facilities will be managed in accordance with the relevant statutory obligations by an appropriately authorised contractor.

17.2.3.1.2 Monitoring

During the construction phase of the Proposed Development, the following monitoring measures will be considered:

- Routine inspections of construction activities will be carried out on a daily basis by the contractor staff to ensure all controls to prevent environmental effect, relevant to the construction activities taking place at the time, are in place. Environmental inspections will ensure that the works are undertaken in compliance with the OCEMP (Lenztech, 2026);
- Routine monitoring and inspections during refuelling to ensure no effects and compliance with avoidance, remedial and mitigation measures; and
- Inspections and monitoring will be undertaken during excavations and other groundworks to ensure that measures that are protective of water quality are fully implemented and effective.

17.2.3.2 Operational Phase

17.2.3.2.1 Mitigation

In addition to the mitigation measures outlined in Section 17.2.3.1.1, which remain applicable during the operational phase, where required, a number of additional mitigation measures have been identified for the operational phase of the Proposed Development.

Article 27 By-products Control

Contract and procurement procedures will ensure that all imported uncontaminated soil and stone materials required for the infilling and recontouring of the site under Article 27 of the European Communities (Waste Directive) Regulations 2011 are sourced from reputable suppliers operating in a sustainable manner and in accordance with industry conformity standards, statutory obligations, and the relevant provisions of the RWMP (DNV, 2026b), ensuring that such materials are not considered waste and are suitable for beneficial use.

- Quality control procedures will be in place to check and verify all materials imported for restoration at site are acceptable. The importation of clean soil and stone (Article 27 by-product) as per EPA guidelines (EPA, 2019) will be subject to robust management and control procedures, which shall include testing for contaminants, invasive species and other anthropogenic inclusions;
- Material imported to the site under Article 27 must be demonstrated to be clean, inert and suitable for reuse;
- All soil and stone imported to the site for infilling and recontouring purposes shall be monitored in accordance with the requirements of Article 27 of the European Communities (Waste Directive) Regulations 2011 and the EPA Guidance on Soil and Stone By-Products (EPA, 2019). This will ensure that only clean, inert materials, free from contamination, invasive species and other anthropogenic inclusion, are accepted for use at the site, thereby preventing the introduction of potential contaminant sources;
- Only surplus construction material (soil and stone) will be transferred to the infill lands;
- Priority shall be given to greenfield soil and stone sources, defined as material derived from previously undeveloped lands. Each greenfield source shall be supported by:
 - Confirmation of greenfield status;
 - Article 27 registration and/or notification;
 - A Material Producer's Declaration and associated Statement of Conformity confirming that the material qualifies as a by-product under Article 27 and is suitable for use at the receiving site; and
 - Source information will be reviewed and approved prior to the importation of material to the site.
- For any infrequent or once-off irregular material delivery access, a designated operator and assigned keyholder will be tasked with the transfer of the low volumes. This will assist in controlling access and ensure the continued recovery of only suitable licenced material at the development lands used for infilling and recontouring works;
- Material transferred to the site will be distributed in locations making it suitable for regrading;
- Where soil and stone are proposed to be imported from non-greenfield or previously developed sources, additional supporting information may be required to demonstrate geochemical suitability. This may include soil analytical data and/or a source-specific risk assessment, as appropriate, in accordance with EPA (2019) guidance; and
- Any material received from an unapproved or unverified source, or which fails to meet the Article 27 acceptance criteria, shall be rejected and shall not be incorporated into the infill.

In addition, the reprofiling (i.e., regrading) of the surface will be carried out to allow for the planting of native grassland. The reprofiling works will be supervised by a qualified landscape architect or equivalent to ensure that the filling is carried out in a manner that will derive maximum benefit from this.

17.2.3.2.2 Monitoring

During the operational phase of the Proposed Development, the following monitoring measures will be considered:

- Daily records and inspections of material transferred to the site for infilling (i.e., Article 27, by-products) will be recorded and supervised at the source of origin and by the main site access / security personnel at the construction site entrance;
- Routine monitoring and inspections during refuelling to ensure no effects and compliance with avoidance, remedial and mitigation measures;
- Any stockpiled material will be monitored for stability and to ensure there are no emission such as dust or runoff;
- All soil and stone imported to the site for infilling and recontouring purposes shall be monitored in accordance with the requirements of Article 27 of the European Communities (Waste Directive) Regulations 2011 and the EPA Guidance on Soil and Stone By-Products (EPA, 2019). This will ensure that only clean, inert materials, free from contamination, invasive species and other anthropogenic inclusions, are accepted for use at the site, thereby preventing the introduction of potential contaminant sources;
- Priority shall be given to greenfield soil and stone sources, defined as material derived from previously undeveloped lands. Each greenfield source shall be supported by:
 - Confirmation of greenfield status;
 - Article 27 registration and/or notification;
 - A Material Producer's Declaration and associated Statement of Conformity confirming that the material qualifies as a by-product under Article 27 and is suitable for use at the receiving site; and
 - Source information will be reviewed and approved prior to the importation of material to the site.
- All loads of imported soil and stone shall be subject to visual inspection on arrival at the site and prior to placement, to confirm the absence of contamination, invasive species, staining, odours or anthropogenic inclusions;
- Where soil and stone are proposed to be imported from non-greenfield or previously developed sources, additional supporting information may be required to demonstrate geochemical stability. This may include soil analytical data and/or a source-specific risk assessment, as appropriate, in accordance with EPA (2019) guidance; and
- Any material received from an unapproved or unverified source, or which fails to meet the Article 27 acceptance criteria, shall be rejected and shall not be incorporated into the infill.

17.2.4 Hydrology and Hydrogeology

17.2.4.1 Construction Phase

17.2.4.1.1 Mitigation

During the construction phase, all works will be undertaken in accordance with the OCEMP (Lenztech, 2023). Following appointment, the contractor will be required to further develop the OCEMP to provide detailed construction phasing and methods to manage and prevent any potential emissions to ground and surface water with regard to the relevant industry standards (e.g., Guidance for Consultants and Contractors, CIRIA-C532', CIRIA, 2001). The OCEMP will be implemented for the duration of the construction phase, covering construction management activities that will take place during the construction phase of the Proposed Development.

Mitigation works will be adopted as part of the construction works for the Proposed Development. These measures will address the main activities of potential impact, which include:

- Control and Management of surface water runoff;
- Control and Management of Infilling of Open Waterbodies;
- Control and Management of Works Adjoining Watercourses;
- Appropriate fuel and chemical handling, transport and storage;
- Management of accidental release of contaminants at the site; and
- Control and handling of cementitious materials.

The construction works will be managed in accordance with all statutory obligations and regulations and with standard international best practice. Good construction management practices will minimise the risk of pollution from construction activities at the subject site including but not limited to:

- Construction Industry Research and Information Association (CIRIA), 2001. Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors;
- CIRIA, 2015. Environmental Good Practice on Site (C741);
- Enterprise Ireland Oil Storage Guidelines (BPGCS005);
- Environmental Protection Agency (EPA), 2013. IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities;
- CIRIA, 2007. The SuDS Manual (C697);
- UK Environment Agency, 2004. UK Pollution Prevention Guidelines (PPG);
- CIRIA, 2006. Control of Water Pollution from Linear Construction Projects: Technical Guidance (C648);
- Inland Fisheries Ireland (2016). Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters.

Control and Management of Water and Surface Runoff

As documented in the Health Risk Assessment (DNV, 2026a; refer to Volume 3 Appendix 7-1 of the EIAR), there will be no direct discharge to groundwater or surface water during the construction phase of the Proposed Development. The following mitigation measures will be adhered to during the construction phase of the Proposed Development:

- Silt fencing will be installed prior to the commencement of construction to ensure the protection of the onsite drainage ditches. Silt fencing will also be installed around the perimeter of the site and silt traps within the drainage ditches to avoid sediment laden to migrate offsite to downgradient waterbodies;
- During the construction phase of the Proposed Development, measures would be adopted in order to prevent silt, chemicals and/or other contaminants from being washed into existing waterbodies (i.e., drainage ditches). Areas exposed due to the removal of vegetation are more susceptible to erosion during heavy rainfall, therefore, the areas would be reinstated as soon as possible to minimise this effect.
- Regular monitoring and prompt maintenance of the SuDS measures will ensure that the drainage system continues to function as designed:
 - Use of silt traps, silt fences and SuDS measures;
 - Exclusion zones between earthworks, stockpiles and temporary surfaces;
 - Temporary construction surface water drainage and sediment control measures installed prior to earthworks commencing;
 - Scheduling construction activities taking forecast weather conditions into consideration;
 - Silt ponds will be constructed on site as necessary to contain silt runoff; and
 - An earth bund and silt fence will be constructed around the perimeter of the infill area. The earth bund and silt fencing will act as temporary sediment control devices to protect receiving watercourses from sediment and potential surface water runoff from the site. The fencing will be inspected twice daily based onsite and weather conditions for any signs of contamination or excessive silt deposits and records of these checks will be maintained.
- A 10-meter buffer and silt fence will be maintained along the western drainage ditch, where no soil importation shall take place to protect surface waters and to ensure that there are no offsite nuisances created by the site;
- Stockpiles of loose materials pending reuse onsite will be protected for the duration of the works and not located in areas where sediment laden runoff may enter existing surface water drains.
 - To help shed rainwater and prevent ponding and infiltration, the sides and top of the stockpiles will be regraded to form a smooth gradient with compacted sides reducing infiltration and silt runoff;
 - Where required, silt fences will be erected at the toe of stockpiles to prevent runoff;
 - The silt fences will be monitored daily by the appointed contractor and silt will be removed as required;
 - Any materials excavated onsite during the construction works (i.e., construction phase) will be stored onsite close to the excavation location and reused where it is appropriate to do so during the operations phase. As such, offsite disposal of this material is not anticipated; and
 - Low mound stockpiles will be formed from excavated material away from open drains.
- A regular review of weather forecasts of heavy rainfall will be conducted, and a contingency plan will be prepared before and after such events to minimise any potential nuisances. As the risk of the break-out of silt-laden runoff is higher during

these weather conditions, no work will be carried out during such periods where possible.

Management of Drainage Ditches Infill Works

The infilling of the existing drainage ditches onsite will be undertaken with cognisance to Construction Industry Research and Information Association (CIRIA), 2006. 'Control of Water Pollution from Linear Construction Projects: Technical guidance' (CIRIA C649) and 'Control of water pollution from construction sites. Guidance for consultants and contractors (C532)' and the following mitigation measures will be strictly adhered to:

- The infilling of existing drainage features including drainage ditches and bog drains will be completed in accordance with Series 600 of the TII Specification for Road Works and the recommendations contained within the 'NRA Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes';
- The existing drainage features (i.e., charted bog/field drains) will be cleared of vegetation and filled with clean washed CL6A material to TII specification. They will be maintained and upgraded to filter drains to maintain existing drainage flows;
- Before vegetation clearance commences, drainage runoff controls such as silt traps should be installed at the point where the site boundary intercepts any onsite drainage ditch along the northern or southern boundary. This should remain in-place for the duration of the construction phase;
- The installation of a 450mm diameter perforated pipe and permeable surround within the infill area will be applicable to all surface water drains onsite;
- All material placed into drainage features shall be deposited by end tipping without compaction;
- The water will be allowed to flow through the existing drainage features at right angles in either direction;
- Runoff from the areas of exposed soil will be intercepted by a silt containment barrier (i.e., silt fence) installed in advance of the drainage ditch;
- Any machines working in the vicinity of the open waterbodies will be protected against leakage or spillage of fuels, oils, greases and hydraulic fuels;
- Any displaced water during the infilling of the open waterbodies will be allowed to infiltrate to ground in the immediate surrounding area. Where required, drainage runoff controls such as silt fences and silt traps will be provided; and
- All trucks leaving the site will pass through a dry wheel wash, thereby removing the potential for transport of sediment offsite. The wheel wash will be periodically cleaned out and its contents will be disposed of in the appropriate manner by a suitably licensed waste contractor and never discharged onsite.

Control and Management of Works Adjoining Drainage Ditches

Silt fencing or bunding along the length of the drainage ditches will be erected following the clearance of the site (i.e., vegetation clearance), which will take cognisance of IFI Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Water (IFI, 2016). The silt fencing will act in filtering any potential surface water runoff from the site generated during the proposed works and will be retained in place for the duration of the construction phase until the development is complete. The project specific CEMP (which will be finalised

by the main Contractor in advance of construction works commencing) will identify how this silt curtain is to be installed and maintained throughout the construction phase.

- The silt fences will be monitored to ensure that they remain functional throughout the construction of the Proposed Development (and throughout the operational phase);
- Where necessary, maintenance will be carried out on the fences to ensure that they continue to be effective. This will be particularly important after heavy rainfall events;
- The checks will undertaken by the Environmental Manager;
- The frequency of monitoring will depend on the stage of works, and local environmental conditions;
- Daily checks may be appropriate during the initial site clearance, during works in the vicinity of the drainage ditches and during and after storm events; and
- Weekly or bi-weekly checks may be appropriate at others times (i.e., during the operational phase).

All works carried out in or adjacent to the drainage ditches will adhere to the IFI Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters (IFI, 2016), the TII Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (TII, 2008) and CIRIA C648 Control of Water Pollution from Linear Construction Projects (CIRIA, 2006).

All near stream works will include the following measures:

- Entry to the drainage ditches by vehicles will not be permitted, while vehicle usage along the banks will be restricted as much as practicable. Any machines working in close proximity of the watercourse must be protected against leakage or spillage of fuels, oils, greases and hydraulic fuels; and
- Silt fences and other sediment control measures will be utilised as required to prevent sedimentation in the drainage ditches.

Handling of Fuels, Chemicals and Materials

Fuelling and lubrication of equipment will be carried out in accordance with the procedures outlined in the OCEMP (Lenztech, 2023), in a designated area of the site (i.e., bunded areas), away from any watercourses and drains (where not possible to carry out such activities offsite) with full attendance of plant operatives.

Fuel will not be stored onsite for the duration of the Proposed Development within the site compound in secure, fit for purpose containers within bunded containment as appropriate and in accordance with CIRIA guidance documents as documented in the OCEMP (Lenztech, 2023). Fuel will only be brought to site via mobile fuel bowser. Any other oils or hydraulic oils stored onsite will be stored in designated areas in suitable tanks and containers. These areas will be bunded and located away from surface water features.

Spillage of fuel, oil and chemicals will be minimised by implementation of an Emergency Pollution Prevention Plan (EPPP), which would be prepared by the contractor as part of the CEMP. In the event of any spillage or pollution of any watercourse, the emergency spill procedures as described in the EPPP would be implemented immediately.

- Generally, refuelling of mobile plant and machinery will be carried out at a designated location within the site compound only at a dedicated impermeable refuelling pad or

by mobile double-bunded bowzers at their place of work. The refuelling pad would be bunded and equipped with a collection sump. Refuelling will be carried out using an approved mobile fuel bowser with a suitable pump and hose;

- All other fuels, oils and potential contaminants, as well as waste oils, will be stored within the site compound in secure, fit for purpose containers within bunded containment as appropriate and in accordance CIRIA guidance documents (Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors-2001, Environmental Good Practice on Site-C650), EPA “IPC Guidance Note on Storage and transfer of Materials for Scheduled Activities” and with SEPA guidance (GPP 2: Above ground oil storage tanks, January 2018);
- Bunds will have regard to the Environmental Protection Agency guidelines ‘Amendment to IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities’ (EPA, 2013). All tank and drum storage areas will, as a minimum, be bunded to a volume not less than the greater of the following:
 - 110% of the capacity of the largest tank or drum within the bunded area; or
 - 25% of the total volume of substance that could be stored within the bunded area.
- Strict supervision of contractors will be adhered to in order to ensure that all plant and equipment utilised onsite is in good working condition;
- Any equipment not meeting the required standard will not be permitted for use within the Proposed Development site;
- Only emergency breakdown maintenance will be carried out onsite;
- Drip trays and spill kits will be available onsite to ensure that any spills from vehicles are contained and removed offsite;
- Spill kits will be made available and kept onsite at all times and identified with signage for use in the event of an environmental spill or leak; and
- Method statements for dealing with accidental spillages will be provided the Contractor for review by the Employer’s Representative.

There may also be the requirement for use of onsite generators or similar fuel containing equipment during the construction phase of the Proposed Development, which will be placed on suitable drip trays. Regular monitoring of drip tray content will be undertaken to ensure sufficient capacity is maintained at all times.

Concrete Works

The use of cementitious material employed during the construction phase of the Proposed Development will avoid any contamination of the receiving hydrogeological environment through the use of appropriate design and methods implemented by the appointed contractor and in accordance with the OCEMP (Lenztech, 2023), and relevant industry standards to prevent impact on groundwater and surface water quality such as the use of water compatible grout.

The following are mitigation measures that need to be adhered to when using concrete for the Proposed Development:

- Concrete batching will take place offsite;
- Wash down and wash out of concrete trucks will take place into a container located within a controlled bunded area which will then be emptied into a

skip for appropriate compliant removal offsite in accordance with all relevant waste management legislation;

- Any excess concrete is not to be disposed of onsite;
- Pouring of cement-based materials for works will only be carried out in dry conditions and pumped concrete will be monitored to ensure there is no accidental discharge;
- A suitable risk assessment for wet concreting shall be completed prior to works being carried out. Pumped concrete will be monitored to ensure there is no accidental discharge; and
- Pouring of concrete will not be permitted within 50m of any watercourse during inclement weather.

Emergency Procedures

Emergency procedures will be developed by the appointed contractor in advance of works commencing. Remedial action will be immediately implemented to address any potential impacts in accordance with industry standards and legislative requirements. The following mitigation measures will be adhered to as follows:

- Emergency response procedures and contingency plans will be put in place, in the unlikely event of emergency accidents (i.e., spillages of fuels or lubricants);
- Spill kits, including oil absorbent material, will be provided and available onsite, so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained;
- In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the Proposed Development site and compliantly disposed of offsite. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures, standards and EPA guidelines;
- All construction works staff will be familiar with the emergency procedures in the event of accidental fuel spillages; and
- All construction works staff onsite will be fully trained on the use of equipment.

Welfare Facilities

Welfare facilities will be provided for the full duration of the Proposed Development. Temporary welfare facilities (i.e., temporary portaloo and an onsite welfare facility cabin with self-contained toilet and washing facilities) have the potential, if not managed appropriately, to release organic and other contaminants to ground or watercourses.

The following mitigation measures will be adhered to during the construction phase of the Proposed Development as follows:

- Effluent and waste from temporary onsite welfare facilities would be maintained, collected and disposed (i.e., tankered offsite) by an approved licenced waste contractor;
- All waste will be managed in accordance with the relevant statutory obligations and with relevant waste management legislation; and
- Welfare facilities will comply with the Health and Safety Authority (HSA) Requirements for Construction Site Welfare Facilities (2017).

17.2.4.1.2 Monitoring

During the construction phase of the Proposed Development the following monitoring measures will be considered:

- The location of all drainage features will be identified and surveyed prior to commencement for record and maintenance purposes;
- An ECoW will be appointed to ensure best practices are adhered to and that recommendations outlined in the OCEMP are effectively implemented;
- Inspections will be undertaken during the limited excavations and other groundworks to ensure that measures that are protective of water quality outlined in this EIAR and the OCEMP are fully implemented and effective;
- All surface water control measures, including silt traps, silt fences, etc., will be checked regularly and maintained as necessary, in order to ensure continued effectiveness throughout the construction phase;
- Ongoing regular operational monitoring and maintenance of drainage and the SuDS measures will be undertaken throughout the construction phase of the Proposed Development;
- Visual inspection of the drainage ditches present at the site will be undertaken daily to ensure no sediment/pollutant deposits are evident;
- Ongoing regular operational monitoring and maintenance of drainage and the SuDS measures will be undertaken during the construction phase of the Proposed Development;
- Visual daily inspection of the drainage ditches during the infilling of the ditches with clean washed Clause 6A material to ensure there are no fines or dust particles entrained in the filling material; and
- Routine monitoring and inspections during refuelling, concrete works to ensure no impacts and compliance with avoidance, remedial and mitigation measures.

17.2.4.2 Operational Phase

17.2.4.2.1 Mitigation

Only clean, inert soil and stone from greenfield development sites will be imported under Article 27 to the site for the infilling and recontouring phase.

The mitigation measures outlined for the construction phase will continue to apply, where relevant, during the operational phase of the Proposed Development. These measures will ensure the ongoing protection of surface water, groundwater and peatland hydrology. In addition to the construction phase controls that remain applicable, a small number of operational specific mitigation measures will also be implemented and will address the main activities of potential impact, as outlined below:

- Management and control of imported soil and aggregates from offsite sources; and
- Management and control during the recontouring works.

Importation of Soil and Stone

The following mitigation measures will be adhered to during the operational phase of the Proposed Development as follows:

- All materials imported to the site for recovery will be inspected on delivery and prior to unloading / placement on the site;
- All soil and stone imported to the site for infilling and recontouring purposes shall be monitored in accordance with the requirements of Article 27 of the European Communities (Waste Directive) Regulations 2011 and the EPA Guidance on Soil and Stone By-Products (EPA, 2019). This will ensure that only clean, inert materials, free from contamination, invasive species and other anthropogenic inclusions, are accepted for use at the site, thereby preventing the introduction of potential contaminant sources;
- Any unsuitable materials will be removed from the site in accordance with all legislative requirements;
- Where applicable, the removal of surplus materials arising during the construction phase of the Proposed Development will be managed in accordance with the byproduct provisions of Article 27 of the European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011), as amended. A byproduct assessment shall be undertaken to demonstrate that any such surplus material satisfies all four conditions set out in Article 27 prior to its removal from the site. Where applicable, this will be addressed either by way of a project specific Article 27 notification to the EPA or by confirming that the material falls within the scope of a valid Article 27 registration held with the EPA. In accordance with EPA guidance, surplus material shall not be removed from the site until the Article 27 assessment has been completed and the material is confirmed to be covered by the relevant notification or registration;
- All loads of imported soil and stone shall be subject to visual inspection on arrival at the site and prior to placement, to confirm the absence of contamination, invasive species, staining, odours or anthropogenic inclusions;
- Where soil and stone are proposed to be imported from non-greenfield or previously developed sources, additional supporting information may be required to demonstrate geochemical suitability. This may include soil analytical data and/or a source-specific risk assessment, as appropriate, in accordance with EPA (2019) guidance; and
- Any material received from an unapproved or unverified source, or which fails to meet the Article 27 acceptance criteria, shall be rejected and shall not be incorporated into the infill.

Recontouring

The recontouring (i.e., restoration) of the site will take into consideration the surrounding landscape, the local groundwater flow regime and proposed use of the lands for agriculture and will be undertaken in accordance with the requirements of applicable EPA restoration guidelines. Where required, the appropriate drainage layers will be incorporated into the soil cover to minimise potential issues for slope stability associated with pore water.

Accordingly, any potential impact on receiving surface water and groundwater beneath the Proposed Development will be avoided taking account of the design and mitigation proposals. Therefore, it is considered that the water quality protection criteria and objectives of the SuDS and Water Framework Directive will be achieved.

17.2.4.2.2 Monitoring

During the operational phase of the Proposed Development, the following monitoring measures will be considered:

- Ongoing regular operational monitoring and maintenance of drainage and the SuDS measures will be undertaken throughout the operational phase of the Proposed Development until the decommissioning works (Phase 4);
- All soil and stone imported to the site for infilling and recontouring purposes shall be monitored in accordance with the requirements of Article 27 of the European Communities (Waste Directive) Regulations 2011 and the EPA Guidance on Soil and Stone By-Products (EPA, 2019). This will ensure that only clean, inert materials, free from contamination, invasive species and other anthropogenic inclusions, are accepted for use at the site, thereby preventing the introduction of potential contaminant sources;
- Priority shall be given to greenfield soil and stone sources, defined as material derived from previously undeveloped lands. Each greenfield source shall be supported by:
 - Confirmation of greenfield status;
 - Article 27 registration and/or notification;
 - A Material Producer's Declaration and associated Statement of Conformity confirming that the material qualifies as a by-product under Article 27 and is suitable for use at the receiving site; and
 - Source information will be reviewed and approved prior to the importation of material to the site.
- All loads of imported soil and stone shall be subject to visual inspection on arrival at the site and prior to placement, to confirm the absence of contamination, invasive species, staining, odours or anthropogenic inclusions;
- Where soil and stone are proposed to be imported from non-greenfield or previously developed sources, additional supporting information may be required to demonstrate geochemical suitability. This may include soil analytical data and/or a source-specific risk assessment, as appropriate, in accordance with EPA (2019) guidance; and
- Any material received from an unapproved or unverified source, or which fails to meet the Article 27 acceptance criteria, shall be rejected and shall not be incorporated into the infill.

17.2.5 Air Quality

17.2.5.1 Construction Phase

17.2.5.1.1 Mitigation

Given the nature of the Proposed Development, no specific mitigation measures are required during the construction phase of the Proposed Development in relation to air quality.

17.2.5.1.2 Monitoring

Given the nature of the Proposed Development, no specific monitoring measures are required during the construction phase of the Proposed Development in relation to air quality.

17.2.5.2 Operational Phase

17.2.5.2.1 Mitigation

To minimise the potential risks of air quality impacts occurring during operations, a series of mitigation measures have been prepared and will be implemented. These measures are designed in accordance with best practice guidance, including the Institute of Air Quality Management (IAQM, 2016), and aim to reduce fugitive dust emissions, manage vehicle-related pollutants, and maintain site cleanliness. The measures are proportionate to the scale and nature of the proposed development and will be monitored regularly to ensure effectiveness.

Dust Suppression and Site Management

- Rotary atomisers, water bowsters and vapour mists will be used during dry weather and during any site preparation activities including overburden removal and excavation;
- Black, horticultural windbreaks will be established around the infilling area that are at least as high as stockpiled materials on site to capture any windblown dust that could be at risk from being blown towards sensitive receptors;
- Stockpiles will be designed and located to minimise exposure to prevailing winds and reduce the duration of storage;
- Exposed surfaces (e.g. topsoil and overburden mounds) will be vegetated or regularly dampened down to prevent dust lift-off;
- Drop heights during loading and unloading of materials will be minimised to reduce dust plumes; and
- Dust generating activities will be located away from sensitive receptors where possible and shielded by bunds or natural topography.

Vehicle and Machinery Controls

- Wheel washing facilities will be provided at site exits, with a surfaced road between the wash and the entrance to prevent track out;
- Loose loads of fine materials will be covered or sprayed prior to leaving the site;
- Internal haul roads will be compacted, graded, and maintained to reduce dust generation;

- Vehicle speeds will be restricted on site, and upswept exhausts will be used where applicable;
- Engine idling will be minimised; machinery will not be left running unnecessarily; and
- All vehicles and equipment will be regularly maintained to reduce emissions.

Operation Controls and Monitoring

- Daily visual inspections will be carried out to assess fugitive dust levels. If elevated dust levels are observed, operations will be curtailed until conditions improve or corrective measures are implemented;
- The EPA national air quality forecast will be monitored, and operations will be adjusted during periods of elevated pollution;
- Dust deposition will be monitored using Bergerhoff gauges in accordance with VDI 2119 and TA Luft standards, where appropriate;
- A Dust Management Plan (DMP) will be maintained, outlining roles, responsibilities, monitoring protocols, and response procedures; and
- Staff will be trained in dust management procedures and mitigation responsibilities.

Road Perimeter Management

- A road sweeper will be used regularly on the site entrance and adjacent public roads to prevent dust accumulation;
- Landscaped mounds and screening bunds will be maintained around the site perimeter to reduce off-site dust dispersion; and
- Site layout will be reviewed periodically to ensure optimal shielding and minimal haul distances.

17.2.5.2.2 Monitoring

Monitoring of dust emissions during the operational phase will be undertaken to ensure that dust-related effects are not experienced beyond the Proposed Development site boundary. Where required, dust deposition will be measured using the Bergerhoff Method, in accordance with VDI 2119 and TA Luft standard.

This method involves placing Bergerhoff Dust Deposit Gauges at strategic locations along the site boundary for a period of 30 +/- 2 days. The selection of sampling point locations will be based on the requirements of VDI 2119, taking account of factors such as proximity to sensitive receptors, prevailing wind directions, and the presence of buildings or other obstructions. Gauges will be positioned at an appropriate height above ground level to ensure representative sampling.

At the end of the exposure period, the gauges will be removed, and the dust deposits will be analysed gravimetrically. Results will be expressed as a dust deposition rate in mg/m²/day in accordance with the TA Luft guideline limit for 350 mg/m²/day.

17.2.6 Climate

17.2.6.1 Construction Phase

17.2.6.1.1 Mitigation

Climate Avoidance, Remedial & Mitigation Measures

During the construction phase, specific climate resilience measures should focus on ensuring durability, water management, and energy efficiency while mitigating risks associated with extreme weather considering dust, dry spells, shade, cooling, green/blue infrastructure, and the required drainage capacity.

Foundation & Site Preparation

- Flood Resilient Foundations: Use raised foundations, elevated platforms, or piling where necessary in flood-prone areas;
- Sustainable Drainage Installation: Implement permeable surfaces, drainage channels, green/blue infrastructure and attenuation tanks early in construction; and
- Soil Stabilisation: Prevent erosion and dust generation with silt fences, geotextiles, and retaining structures to withstand heavy rainfall.

Structural Reinforcement

- Wind-Resistant Framing: Use reinforced concrete or steel frames with proper anchoring to withstand storms.

Water Management

- Proper Drainage on Site: Ensure temporary drainage solutions, including the early adoption of green/blue infrastructure (e.g., trenches,, sumps) to manage rainwater and fluctuations in drainage capacity throughout the seasons during construction.

Material Selection & Handling

- Use Climate-Resilient Materials: Opt for treated timber, marine-grade plywood, concrete with low permeability, and corrosion-resistant steel;
- Storage & Protection of Materials: Keep materials covered and off the ground to prevent water damage or degradation; and
- Low-Carbon Concrete & Insulation: Use alternatives like Ground Granulated Blast-furnace Slag (GGBS) concrete and eco-friendly insulation.

Energy Efficiency & Passive Design Implementation

- High-Performance Insulation Installation: Ensure proper fitting to avoid thermal bridging and moisture ingress.

On-Site Climate Adaptation Measures

- Construction Scheduling Considerations: Plan for extreme weather events, avoiding major excavation or external works in heavy rain seasons;
- Cold/Hot Weather Plan: Strategies such as planned road gritting, measures to prevent increased dust during hot dry spells, thermal protection such as shaded and cooler areas, chemical accelerants, temporary enclosures, and alternative heating/cooling

solutions to enable builders to overcome these obstacles and achieve success project outcomes;

- Temporary Wind & Rain Barriers: Use tarpaulins, scaffolding covers, and temporary roofing to protect partially built structures; and
- Emergency Power Supply: Have generators or battery backups on site to maintain critical construction processes.

Greenhouse Gas (GHG) Resilience Avoidance, Remedial & Mitigation Measures

Embodies carbon of materials and infilling activities is the primary source of climate impacts during the construction phase.

Carbon Literacy

- Develop carbon literacy within design and construction teams by providing training on carbon literacy, ESG reporting, and disclosure;
- Incorporate sustainability and carbon considerations into site team talks, construction targets, and reporting; and
- Include training clauses for contractors and sub-contractors to upskill their teams in low-energy construction techniques.

Cement Reduction

- Specify the minimum amount of cement needed in concrete and substitute where feasible to reduce cement usage.

Sustainable Procurement

- Review sustainable procurement and material choices during detailed design to identify and implement lower embodied carbon options;
- Request Environmental Product Declarations (EPDs) and prefer products with EPDs where possible within procurement restrictions; and
- Drive demand for EPDs by increasing the percentage of products used in the project with EPDs.

Energy and Carbon Performance Reporting

- Plan to disclose the operational energy and carbon performance of the project in annual reporting.

Construction Waste Management

- Create construction programme allowing sufficient time to determine reuse and recycling opportunities for demolition waste.

EU Taxonomy Compliance

- Review and ensure compliance with the EU Taxonomy Regulation (EU) 2020/852 regarding circular economy practices for construction waste.

Local Material Sourcing

- Source materials locally where possible to reduce transport-related CO₂ emissions.

Table 17-5 details potential construction phase impacts and mitigations for climate hazards.

Table 17-5. Climate Change Construction Phase Hazard-Mitigation Matrix

Climate Hazard	Potential Construction-Phase Impact	Mitigation Measures (to be included in CEMP)	Trigger / Monitoring Mechanism
Prolonged Dry Spells / Drought	- Dust generation from soil stockpiles and haul routes - Desiccation and instability of exposed soils - Increased wildfire susceptibility - Worker heat stress	- Hydro-mulching or drought-resistant vegetation on stockpiles - Scheduled wetting using harvested / non-potable water - Fire-risk controls (no-spark tools, extinguishers, exclusion zones) - Heat-stress protocol: shaded rest areas, hydration management, work-rotation	- Met Éireann dry-spell alerts - Visual dust inspections (daily) - PM10/PM2.5 spot monitoring if required
Extreme Rainfall / Intense Precipitation	- Runoff causing erosion and sediment pollution - Overloading of temporary drainage - Excavation collapse - Delays to concrete curing	- Oversized temporary SuDS (silt traps, settlement tanks) with climate change freeboard - Sequenced earthworks to limit exposed surface area - Rapid-deployment drainage (cut-off drains, temporary ditches) - Protective coverings for exposed soil - Inspection and reinforcement of excavations	- Met Éireann yellow/orange rainfall warnings - Daily inspection of drainage features and excavations
High Winds / Storm Events	- Destabilisation of cranes and scaffolding - Wind-borne debris - Damage to temporary structures and sheeting	- Wind-trigger shutdown protocols for cranes - Secure all sheeting, signage, and loose materials - Lowering of crane booms during high winds - Storage of light materials in sheltered areas	- Anemometer readings - Manufacturer specific crane wind thresholds
Extreme Heat / High UV	- Worker heat stress - Accelerated degradation of temporary materials - Reduced concrete curing quality	- Mandatory UV-rated PPE - Adjusted work schedules for heat - Insulated curing blankets; moisture-retentive curing methods - Additional shading/temporary shelter	- Daily temperature/UV index - Heat-stress monitoring records
Cold Spells / Freeze-Thaw	- Frozen ground affecting temporary works - Curing delays; compromised concrete integrity	- Thermal blankets and insulated formwork - Cold-weather concreting accelerants - Gritting of access routes - Monitoring ground temperatures before excavation	- Met Éireann cold-weather alerts - Ground temperature probes

	- Slip hazards		
Wildfire (Low Probability but Climate-Increasing)	- Fire risk to vegetated boundaries and stockpiles - Smoke hazard to workers	- Vegetation management buffer zones - Fire-resistant fencing where required - No-spark tools and smoking restrictions - Onsite fire-fighting equipment	- HSA wildfire advisory updates - Site inspections during prolonged heat/drought
Lightning / Thunderstorm Activity	- Electrocution risk during crane/steel erection - Power surge to temporary site electrics	- Lightning-alert stoppage protocol for crane and steel operations - Surge protection on temporary electrical installations - Evacuation of high-risk elevated work areas	- Lightning warning alerts (Met Éireann / Weather Radar)
Ground Instability (shrink-swell / saturation)	- Excavation collapse - Differential movement beneath temporary structures	- Geotechnical inspections after prolonged dryness or heavy rainfall - Adaptive temporary shoring - Staged excavation	- Soil moisture condition checks - Engineer sign-off after major weather events
Fog / Reduced Visibility	- Increased collision risk for plant and vehicles	- Reduced-speed protocols - Enhanced lighting on plant - Temporary traffic marshals in fog conditions	- Visibility thresholds (e.g., <100 m)
Supply Chain Disruption due to Severe Weather	- Programme delays - Increased idling, emissions, non-compliant workarounds	- Flexible delivery scheduling - Critical materials buffer stock - Idling-reduction enforcement	- Weather-based risk assessments in weekly planning
High Wind-Driven Rain	- Water ingress into partially built structures - Damage to moisture-sensitive materials	- Temporary waterproof membranes - Elevated storage off ground - Weatherproofing early in build sequence	- Rainfall + wind combined warnings

17.2.6.1.2 Monitoring

We recommend the following monitoring strategies to ensure compliance with the environmental objectives outlined in this EIA. These strategies are essential for effectively managing the environmental impacts associated with the construction and reinstatement phases, with a particular focus on resource recovery, waste management, and the reduction of GHG emissions.

Monitoring of Reinstatement Waste Reuse and Recycling

To optimise the reuse and recycling of reinstatement materials, we recommend implementing the following:

- **Material Reuse Tracking System:** A digital tracking system could be established to monitor materials identified for reuse or recycling. This system will log details such as quantities, conditions, and intended applications within the new construction areas. It is important that this system is regularly updated to reflect ongoing recovery efforts; and
- **Regular On-Site Inspections:** It is suggested that regular inspections are conducted to verify that materials earmarked for reuse are being properly stored and handled. These inspections should ensure that materials remain in suitable condition for their intended use in the new build areas.

Monitoring of GHG Emissions Reduction Measures

To mitigate the Proposed Development's impact on climate change, the following monitoring activities are proposed:

- **Appoint sustainability champions** to ensure that the Proposed Development continues to perform in a sustainable manner including monitoring and reporting of performance on site;
- **Idle Time Monitoring for Vehicles and Machinery:** It is suggested that GPS or telematics systems are installed on all vehicles and machinery used on-site to monitor engine idling times. Automatic alerts should be set up to notify site managers when idling exceeds a specified threshold, enabling prompt corrective action to reduce unnecessary emissions;
- **Maintenance Logs for Plant and Machinery:** Implementing a digital maintenance log system to track the inspection and maintenance of all on-site equipment is recommended. This system should record inspection dates, maintenance activities, and any identified issues, ensuring that all machinery operates efficiently and with minimal emissions; and
- **Material Waste Minimisation Tracking:** A monitoring system should be developed to track material orders and usage. This system should identify trends in over-ordering or inefficient material use, enabling the project team to take corrective actions that will help minimise the embodied carbon footprint of the site.

Application of Waste Hierarchy

To optimise waste management on-site, the following monitoring protocols are suggested:

- **Waste Segregation Audits:** Regular audits should be conducted to ensure that waste is being properly segregated according to the waste hierarchy (reduce, reuse, recycle). These audits will help identify opportunities for improving waste management practices and reducing overall waste generation; and
- **Monthly Waste Management Reports:** It is suggested that monthly reports are generated detailing the volume of waste reduced, reused, and recycled. These reports should be compared against predefined targets to assess the effectiveness of the waste management strategies and to identify areas for improvement.

Local Sourcing of Materials

To reduce transport-related emissions and support local suppliers, the following measures are suggested:

- **Supplier Distance Monitoring:** A database of suppliers should be developed, documenting the distance of each supplier from the construction site. This database should be used to monitor and minimise the carbon footprint associated with material transportation, prioritising local suppliers wherever possible; and
- **Transport-Related Carbon Footprint Analysis:** Conducting a carbon footprint analysis for the transportation of all materials to the site is recommended. This analysis should inform the selection of suppliers, with a preference for those within a closer radius to reduce CO₂ emissions.

These monitoring recommendations are designed to ensure that the Proposed Development adheres to its environmental commitments, particularly in the areas of resource recovery, waste management, and greenhouse gas emissions reduction. By implementing these strategies, the Proposed Development will not only comply with regulatory requirements but also contribute to broader environmental sustainability goals. Regular reporting, on-site inspections, and third-party audits will be critical to maintaining compliance and achieving the desired environmental outcomes.

Monitoring of Resource Definition and Extraction Planning

Resource Modelling and extraction planning: The use of resource optimisation and scheduling tools will help to clearly identify economically viable deposits and the stages for extraction, help to minimise overburden movement and double handling. This can then provide a clear picture of areas requiring vegetation removal and those suitable for rehabilitation which also budgeting for both operational and capital expenditures, as well as the estimated CO₂ impact of the plan. This can significantly improve how deposits are planned and extracted, thereby maximising net present value (NPV). Additionally, it is essential to baseline the extraction operations, assess how improved resource definition and extraction scheduling/planning will enhance sustainability, and provide estimates on how CO₂ emissions (kilograms per tonne) will be reduced accordingly.

Environmental Management Systems

Implement an Environmental Management Plan that incorporates adaptive management principles. Ensure climate change resilience plans are robust, monitoring of trends in weather events is undertaken and periodic reviews of resilience measures related to interdependencies and carried out.

We further recommend the following monitoring strategies to ensure that the proposed development meets its environmental objectives. These strategies focus on mitigating the impacts of climate change, enhancing energy efficiency, and promoting sustainable transport, all of which are aligned with best practices outlined in Institute of Sustainability & Environmental Professionals (ISEP) guidelines.

To ensure the Proposed Development effectively mitigates the impacts of future climate change, we recommend the following monitoring strategies:

Monitoring of Sustainable Transport Initiatives

To promote sustainable transport and reduce transport-related emissions, we recommend the following monitoring strategies:

- Sustainable Procurement: Ensure all new site machinery and vehicles are the most sustainable option prior to purchase. Consider hybrid and electric technology to accelerate decarbonisation in the area; and
- Low-emission Vehicles/Fuels (LEV): Review and assessment of low carbon vehicle technology and fuel usage onsite in comparison to regular fossil fuel operated vehicles to determine changes in site emissions profile and opportunities and decarbonisation.

These monitoring recommendations are designed to ensure that the development's climate change mitigation measures and sustainable transport provisions are effectively implemented and maintained throughout the lifecycle of the Proposed Development. By adhering to these strategies, the development will not only comply with relevant regulatory requirements but also contribute to broader environmental sustainability goals. Regular inspections and stakeholder engagement will be crucial to achieving the desired environmental outcomes.

17.2.6.2 Operational Phase

17.2.6.2.1 Mitigation

A number of measures have been incorporated into the design of the development in order to mitigate against the impacts of future climate change. For example, adequate attenuation and drainage have been incorporated into the design of the development to avoid potential flooding impacts as a result of increased rainfall events in future years. These measures have been considered when assessing the vulnerability of the Proposed Development to climate change.

Agricultural activities associated with cattle production represent the primary source of climate impacts during the operational phase of the Proposed Development. Emissions arise principally from livestock management, manure handling, fuel use, and on-site energy consumption. While such emissions are inherent to agricultural operations, the implementation of recognised best-practice measures will ensure that GHG emissions are minimised to the extent practicable and that no significant adverse effects on climate arise.

During the operational phase, the following mitigation and adaptation measures shall be implemented on site:

- Energy-Efficient Equipment and Infrastructure: Energy-efficient farm machinery, milking equipment, pumps, lighting, and ancillary infrastructure shall be used where

practicable. All equipment shall be regularly maintained and operated efficiently to reduce fuel and electricity consumption;

- Low-Carbon Vehicles and Fuels: The operator shall remain engaged with developments in low-carbon fuels and agricultural technologies relevant to cattle farming and transport. Conventional fuels shall be reviewed and, where feasible, replaced with lower-carbon alternatives as they become commercially available;
- Vehicle Idling Reduction: Farm vehicles and machinery shall not be left idling when not in active use, including during routine yard and livestock management operations;
- Sustainable Livestock and Land Management: Stocking rates, grazing regimes, and husbandry practices shall be managed efficiently to optimise productivity per animal and reduce emissions intensity. Permanent grassland shall be retained where practicable, and soil disturbance (e.g. ploughing or reseeded) shall be minimised to protect soil carbon stocks;
- Nutrient and Manure Management: Slurry, manure, and fertiliser application shall be informed by soil testing and nutrient management planning, with appropriate timing and methods used to minimise nitrous oxide emissions and nutrient losses;
- Landscape and Boundary Features: Existing hedgerows, trees, and field boundaries shall be retained and managed where practicable. These features contribute to carbon storage, shelter, and overall landscape resilience;
- Sustainability Awareness: Climate considerations, including emissions reduction and climate resilience, shall be integrated into day-to-day agricultural management and decision-making;
- Agricultural Scheduling and Weather Resilience: Farming activities such as slurry spreading, grazing management, and land works shall be planned with regard to prevailing and forecast weather conditions, avoiding periods of heavy rainfall or extreme weather where practicable;
- Hot and Cold Weather Management: Measures shall be in place to protect animal welfare and maintain operational continuity during periods of extreme heat or cold, including provision of shelter, ventilation, bedding management, and alternative water or feeding arrangements where required; and
- Emergency Power Supply: Backup generators or battery systems shall be available on site to maintain critical agricultural processes and animal welfare systems during power outages.

17.2.6.2.2 Monitoring

The following monitoring strategies are recommended to ensure that the proposed development meets its environmental and climate objectives during the operational phase. The strategies focus on verifying the effective implementation of climate mitigation and adaptation measures associated with agricultural land use, energy efficiency, and climate resilience, and are aligned with recognised best practice and relevant ISEP and Teagasc guidance.

Monitoring of Agricultural Climate Mitigation Measures

- Livestock and Land Management Review: Periodic reviews of stocking rates, grazing regimes, and land management practices shall be undertaken to ensure consistency

with sustainable land-use objectives and to minimise emissions intensity, soil degradation, and indirect climate impacts;

- Soil and Grassland Condition Monitoring: Ongoing visual assessment of soil structure, ground cover, and grassland condition shall be undertaken to confirm that permanent pasture is being maintained where practicable and that excessive soil disturbance is avoided; and
- Nutrient Management Oversight: Nutrient management practices, including slurry and fertiliser application rates, timing, and methods, shall be periodically reviewed to ensure alignment with soil nutrient status and best practice, thereby minimising nitrous oxide emissions and nutrient losses.

Energy Use and Farm Operations Monitoring

- Energy and Fuel Use Review: Energy consumption and fuel use associated with farm machinery and on-site operations shall be periodically reviewed to identify opportunities for improved efficiency and reduced emissions; and
- Vehicle and Machinery Practices: Observational monitoring shall be undertaken to ensure that idling reduction measures and efficient machinery operation are being implemented as part of routine farm management.

Landscape and Drainage Monitoring

- Hedgerow and Boundary Feature Management: Existing hedgerows, trees, and field boundaries shall be periodically inspected to ensure their continued retention and appropriate management, supporting carbon storage and climate resilience; and
- Drainage and Runoff Controls: Drainage features and runoff pathways shall be inspected periodically and following significant rainfall events to ensure effective functioning, prevent erosion, and reduce indirect climate impacts associated with soil and nutrient loss.

Climate Adaptation and Resilience Monitoring

- Weather-Responsive Farm Operations: Agricultural activities shall be reviewed on an ongoing basis to confirm that scheduling remains responsive to prevailing and forecast weather conditions, particularly in relation to slurry spreading, grazing management, and land works;
- Extreme Weather Preparedness Review: Measures for managing periods of extreme heat or cold, including animal shelter, water availability, and ventilation, shall be periodically reviewed to ensure continued effectiveness and animal welfare protection;
- Emergency Power Systems Testing: Backup power systems shall be inspected and tested at appropriate intervals to ensure that critical agricultural operations and animal welfare systems can be maintained during power outages.

Review of Climate Risk and Adaptive Management

- Climate Risk Review: Climate risks and vulnerabilities shall be periodically reviewed in light of emerging climate information and operational experience to ensure that mitigation and adaptation measures remain appropriate; and

- Adaptive Management: Where practicable, new or improved agricultural climate mitigation measures that become available and are suitable to the scale and nature of the operation shall be considered for implementation.

17.2.7 Noise and Vibrations

17.2.7.1 Construction Phase

17.2.7.1.1 Mitigation

Noise Mitigation Measures

Best practice measures for noise from construction sites are found within BS 5228 (2009+A1:2014) part 1. Construction noise effects are expected to vary during the construction phase of the Proposed Development; this effect will depend on the distance between the construction activities and noise sensitive receptors. The contractor will ensure that all best practice noise control measures will be used, to ensure any negative noise effects at noise sensitive locations are minimised.

The best practice measures set out in BS 5228 (2009) Part 1 includes guidance on several aspects of construction site mitigation measures, this includes the following:

- Selection of quiet plant and equipment;
- Noise control at source of the noise;
- Screening; and
- Public liaison.

General Recommendations

This section sets out noise mitigation options and detailed comment on each one specifically for the Proposed Development.

Selection of Plant and Machinery

The noise effect of all plant and machinery shall be assessed prior to selection of the plant for the project. Where an item of plant is identified as noisy with the potential to cause a negative noise effect it shall be reviewed to check if there is an alternative quieter version of the same plant to undertake the same construction task.

Noise Control at Source

Where replacing a noisy item of plant is not viable or practical, consideration shall be given to control that noise at source. This includes modifying the piece of plant or machinery to generate less noise, using dampening to control vibration induced noise or rattling. Example best practice mitigation measures to be considered are as follows:

- All plant and equipment to be switched off when not in use to prevent idling;
- The use of white noise reversing alarms;
- Restriction on the dropping and loading of materials to less sensitive hours;
- Not dropping materials onto hard surfaces and using rubber mats etc. for the dropping of materials; and
- Ensure all plant and equipment is well maintained and cleaned, all lubrication should be in line with manufacturer's guidelines.

Public Engagement

A public liaison officer shall be put forward by the contractor to liaise with the local residents on matters relating to noise. Residents shall be informed of any noise works scheduled where

there is the potential to generate high levels of construction noise or if specialist works etc need to be conducted out of the working hours. This person shall also be the point of contact for all complaints and be responsible for reviewing the noise monitoring results and exceedances.

Site Specific Recommendations

Table 17-6 outlines the recommended site-specific noise mitigation measures.

Table 17-6. Mitigation Measures Required During Construction Phase

Construction Stage	Recommended Noise Mitigation Measures
Site Setup	On this project 4 NSL's have been identified, it is recommended that a noise monitor is placed on the boundary of the nearest noise sensitive locations closest to the works i.e. NSL1.
Road Widening	Noise and vibration monitoring.

17.2.7.1.2 Monitoring

Noise and vibration monitoring will be implemented during the construction phase of the Proposed Development, particularly during the road widening works when significant road works will occur. Given the proximity of multiple noise sensitive locations (NSLs) to the site, monitoring equipment shall be installed at NSL 1 during the construction phase.

17.2.7.2 Operational Phase

17.2.7.2.1 Mitigation

Noise Mitigation Measures

The assessment conducted on the operational phase of the Proposed Development takes into account the operation of the infill plant machinery and the various heavy goods vehicles that will be delivering material for the infill process. The predicted results of the operational noise assessment predict that there will be no significant adverse noise effect on the surrounding sensitive receptors, with the exception of reverse alarms which are traditionally single tone and high pitched in nature and can lead to tonal characteristics at the closest noise sensitive receptors, mitigation in the form of broadband white noise reverse alarms are recommended instead of the traditional single tone reverse alarms for use on the Proposed Development to control operational noise levels and reduce the potential for tonal frequency content effects at the closest noise sensitive locations.

Vibration Mitigation Measures

During the operational phase, potential sources of vibration will include the infilling process and the use of heavy plant, specifically excavators and bulldozers. While these activities have the potential to generate localized ground-borne vibration, the risk of perceptible vibration at the nearest sensitive receptors is considered low.

Given the separation distances between the infill areas and the site boundary, as well as the attenuating properties of the underlying peatland substrate, vibration levels are predicted to

remain well below the thresholds for human perception or structural concern. Therefore, no specific mitigation measures are required to control vibration during the operational phase.

17.2.7.2.2 Monitoring

Noise and vibration monitoring is not required during the operational phase of the Proposed Development as the predicted noise levels during the operational phase fall within project criteria, and there are no predicted sources of operational vibration proposed for the development.

In accordance with the Notification of Decision issued by the Planning Authority in 2024, the proposed infill activities on-site must adhere to the relevant waste management legislation.

“This Development is classified as a Landfilling/Waste Facility, reference the Councils adopted Development Contribution Scheme 2017 – 2023.”

Given the volume and nature of the material required for the infill site, the development may necessitate a Waste Management License or a Waste Facility Permit (depending on the final tonnage thresholds) as prescribed under the Waste Management (Facility Permit and Registration) Regulations 2007, as amended.

No infilling or waste deposition activities shall commence until the appropriate authorization has been secured from the EPA or the Local Authority. The appointed contractor will be responsible for ensuring that all imported material is classified as "by-product" or "waste" in accordance with the Waste Framework Directive, and that all site operations remain in strict compliance with the conditions set out in the grant of planning and the subsequent waste permit.

17.2.8 Landscape and Visual

17.2.8.1 Construction Phase

17.2.8.1.1 Mitigation

The key landscape and visual mitigation measures used during the construction phase have been incorporated:

- Into the layout of the site largely away from public roads and general view;
- The quick establishment of perimeter native planting buffers;
- Machinery used in the construction phase will be similar in size and scale as that used in modern intensive agriculture/forestry;
- Works limited to normal working hours 8am to 5pm Monday to Friday;
- Lighting to be non-intrusive and specifically designed to negate or minimise any effect to local properties and any other environmental considerations;
- It is recommended that some of the cleared scrub and vegetation, especially willow and birch offcut boughs/branches and stumps be placed along the boundary line and semi covered with c. 150mm of topsoil to facilitate hardwood propagation of locally established species. These boundaries will be defined with a post and wire fence of minimum height of 1m; and
- Along the eastern boundary the removal of c. 25 multi stemmed hawthorn will be needed to facilitate sightlines. A 2.1m high palisade is proposed behind the sightlines and along the eastern boundary. It is recommended that this fence is black in colour as black recedes into the background more so than other colours. The existing vegetation along this line will be retained and reinforced with dense native planting screen of approximately 5m width.

17.2.8.1.2 Monitoring

To ensure the successful implementation of the Proposed Development, it is proposed that trees for retention have tree protection zones established around them in accordance with BS 5837:2012 in relation to Design, Demolition and Construction – Recommendations.

17.2.8.2 Operational Phase

17.2.8.2.1 Mitigation

The key landscape and visual mitigation measures used during the operational phase are as for the construction phase in 17.2.8.1.1.

Machinery and materials used in the operation of the infilling will be similar in size and scale as that used in modern intensive agriculture.

It is recommended that the dense native planting screen consist of shrub willow, birch, hawthorn, guelder rose, hazel and holly mix at a 1m spacing and planted at a minimum height of 60-90cm, to ensure a quick dense, partially evergreen screen establishment. Along the palisade fence it is recommended that 175/200cm hawthorn plants at 1m spacings are used to ensure rapid screening of the exposed roadside boundary.

17.2.8.2.2 Monitoring

To ensure the successful implementation of the Proposed Development, it is proposed that a landscape architect is engaged to supervise and sign off on the successful establishment of the proposed boundary dense native screening.

17.2.9 Archaeology and Cultural Heritage

17.2.9.1 Construction Phase

17.2.9.1.1 Mitigation

A programme of archaeological monitoring will be carried out across the development area, prior to the commencement of construction. This will be undertaken under licence from the National Monuments Service. Dependant on the results of the assessment, further mitigation may be required, such as preservation *in situ* or by record or archaeological monitoring. Any further mitigation will require approval from the National Monuments Service of the Department of Housing, Local Government and Heritage (see Volume 3: Appendix 12-4 for more details).

17.2.9.1.2 Monitoring

The mitigation measures recommended in 17.2.9.1.1 would also function as a monitoring systems to allow further assessment of the scale of the predicted impacts and the effectiveness of the recommended mitigation measures.

17.2.9.2 Operational Phase

17.2.9.2.1 Mitigation

No mitigation is required for the operational phase with regard to archaeology and cultural heritage

17.2.9.2.2 Monitoring

The mitigation measures recommended in 17.2.9.1.1 would also function as a monitoring systems to allow further assessment of the scale of the predicted impacts and the effectiveness of the recommended mitigation measures.

17.2.10 Materials Assets – Waste and Utilities

17.2.10.1 Construction Phase

17.2.10.1.1 Mitigation

As the use of material assets for the Proposed Development is considered to be minimal, no specific avoidance, remedial or mitigation measures are required in relation to utilities such as water supply, wastewater drainage, electrical supply, telecommunications, or gas.

However, to ensure proper management of waste and alignment with national policy objectives, the following waste-related mitigation measures will be implemented:

- Segregation of waste at source to facilitate reuse and recycling where feasible;
- Storage of waste in designated containers (e.g. wheelie bins) to prevent littering or environmental contamination;
- Regular collection of waste by authorised waste contractors; and
- Compliance with relevant legislation, including the Waste Management Act 1996 (as amended) and associated regulations.

In addition, site management practices and environmental protection measures relevant to surface water, groundwater, noise, dust, and biodiversity have been detailed in other chapters of this EIAR. These measures will ensure that the Proposed Development does not result in significant impacts on the surrounding environment or sensitive receptors.

17.2.10.1.2 Monitoring

See 17.2.10.2.2 below.

17.2.10.2 Operational Phase

17.2.10.2.1 Mitigation

See 17.2.10.1.1 above.

17.2.10.2.2 Monitoring

It is proposed that an environmental monitoring programme will be developed and implemented for the operational lifetime of the Proposed Development. The monitoring programme will verify (i) that implemented controls prevent and minimise emissions from the Proposed Development and (ii) that there is no negative impact on the receiving environment via uncontrolled releases of pollutants, sediment, dust, noise or vibration. Monitoring will also assess the effects of the activities on the environment so that operational changes and improvements can be made where appropriate. The monitoring programme and sampling frequency will be agreed with Laois County Council.

17.2.11 Materials Assets – Traffic

17.2.11.1 Construction Phase

17.2.11.1.1 Mitigation

The construction phase involves site clearing, widening of the local access lane and the establishment of a temporary construction compound with site facilities. The expected duration of this phase is 5 no. days with minimal Light Vehicle (LV) and Heavy Vehicle (HV) movements per day. Potential adverse effects of construction will be managed by Heavy Goods Vehicles (HGVs) using the established haulage routes and the enforcement of mandatory wheel washing when exiting the site.

17.2.11.1.2 Monitoring

Compliance with haul routes to site will be monitored continuously during the construction phase with spot checks carried out to ensure that all heavy vehicles follow the haul routes prescribed.

17.2.11.2 Operational Phase

17.2.11.2.1 Mitigation

As part of the operational phase, several mitigation measures are proposed, which are as follows:

- In order to minimise the potential impact on the local road network surfaces, road cleaning is proposed to be implemented on site during the operational phase to mitigate against material such as dust, earth, debris etc. from entering the local road network, as required. This is in addition to the continuation of wheel cleaning at the site exit; and
- In order to mitigate against the undue impact of heavy vehicles on sensitive locations, vehicles will strictly adhere to the haul route that utilised regional and national roads only, as outlined in Section 13.5.2.4 of Chapter 13 (Material Assets: Traffic and Transport). These haul routes shall be strictly controlled by the client during the duration of the operational phase with all heavy vehicle operators employed being issued maps of sanctioned haul routes to and from the site and under strict instructions to follow these routes.

17.2.11.2.2 Monitoring

Compliance with haul routes to site will be monitored continuously during the operational phase with spot checks carried out to ensure that all heavy vehicles follow the haul routes prescribed. Only pre-approved sources, authorised collection companies, sign up to agreed haulage routes as part of the approval process.

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