## PROPOSED LARGE-SCALE RESIDENTIAL DEVELOPMENT, GALWAY PORT AT LOUGH ATALIA ROAD, GALWAY CITY

# EIAR Volume 2

## Land Development Agency

**Date:** 18-09-2025



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# 1 INTRODUCTION

## 1.1 Introduction

This Environmental Impact Assessment Report (EIAR) has been prepared by Synergy Environmental Limited T/A DNV (hereinafter referred to as 'DNV') for The Land Development Agency (LDA), hereinafter referred to as the Applicant, who is seeking planning permission for a Large-scale Residential Development (LRD) of 356 no. residential apartments, a crèche and 2 no. café/restaurant units and 1 no. retail unit on 1.621 hectare site in Galway Port at Dock Road and Lough Atalia Road, Galway City.

A full description of the Proposed Development is provided in Chapter 2 (Description of the Proposed Development) of this EIAR.

This EIAR has been prepared in accordance with all current legislation and best practice guidance.

Environmental Impact Assessment (EIA) is a process used to identify and evaluate the likely environmental, social, and economic effects of a proposed development, considering both adverse and beneficial impacts. It also involves identifying measures to reduce negative effects and enhance positive ones. The EIA ensures that planning decisions are informed by environmental considerations and stakeholder engagement, and that the assessment is carried out in line with 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.

## 1.2 Quality Assurance and Competency of Experts

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

> "*the developer shall ensure that the environmental impact assessment report is prepared by competent experts"*

This EIAR has been prepared by DNV, supported by sub-consultants on certain specialist assessments (see Table 1-1), taking into account current knowledge and methods of assessment.

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 was prepared by Laura Griffin, Environmental Consultant at DNV. Laura has a Master of Science (Hons) degree in Climate Change from Maynooth University and a Bachelor of Arts (Hons) degree in English and Geography from Maynooth University. Laura has 5+ years of professional experience. Laura has experience preparing Environmental Impact Assessment (EIA) Screening Reports and a EIAR chapters for developments of a similar scale and nature to the Proposed Development.

This report was reviewed by Gráinne Ryan, Principal EIA Consultant at DNV. Gráinne is an Environmental Consultant with over 11 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 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.

For each chapter of this EIAR, the author, along with their qualifications and relevant experience on other development projects, is detailed in the 'Quality Assurance' section at the beginning of each chapter. The EIAR Project Team is also identified in Table 1-1.

*Table 1-1 EIAR Project Team*

| No. | Chapter | Primary Consultant/Author Name and address | Specialist Area |
|---|---|---|---|
| 1 | **Introduction and Methodology** | DNV, 3D Core C, The Plaza, Park West, D12F9T<br>Laura Griffin | Multidisciplinary Planning and Environmental Consultants |
| 2 | **Description of the Proposed Development** | DNV, 3D Core C, The Plaza, Park West, D12F9T<br>Laura Griffin | Multidisciplinary Planning and Environmental Consultants |
| 3 | **Planning and Development Context** | DNV, 3D Core C, The Plaza, Park West, D12F9TN<br>Gráinne Ryan | Multidisciplinary Planning and Environmental Consultants |
| 4 | **Population and Human Health** | DNV, 3D Core C, The Plaza, Park West, D12F9TN<br>Michelle Gaffney | Multidisciplinary Planning and Environmental Consultants |
| 5 | **Biodiversity** | DNV, 3D Core C, The Plaza, Park West, D12F9TN<br>Ciara Barry-Hannon | Ecological Consultancy |
| 6 | **Land and Soils** | DNV, 3D Core C, The Plaza, Park West, D12F9TN<br>Nuria Manzanas | Multidisciplinary Planning and Environmental Consultants |
| 7 | **Hydrology and Hydrogeology** | DNV, 3D Core C, The Plaza, Park West, D12F9TN<br>Nuria Manzanas | Multidisciplinary Planning and Environmental Consultants |
| 8 | **Air Quality** | DNV, 3D Core C, The Plaza, Park West, D12F9TN<br>Laura Griffin | Multidisciplinary Planning and Environmental Consultants |

| No. | Chapter | Primary Consultant/Author Name and address | Specialist Area |
|---|---|---|---|
| **9** | **Climate** | DNV, 3D Core C, The Plaza, Park West, D12F9TN<br><br>Aoife Gillen | Multidisciplinary Planning and Environmental Consultants |
| **10** | **Noise and Vibration** | Wave Dynamics, Unit 202, Nesta Business Centre, Old Airport Rd, Santry, Dublin, D09 HP96<br><br>Cathal Reck | Acoustic Consultancy Services |
| 11 | **Landscape and Visual Impact Assessment** | Model Works, The Old Courtyard, Newtownpark Ave, Blackrock,<br>Co. Dublin, A94 YD61<br><br>Richard Butler | Full-service architectural presentation and analysis studio |
| 12 | **Material Assets - Traffic and Transport** | NRB Consulting Engineers, First Floor, Apollo Building, Dundrum Road, Dundrum, Dublin 14<br><br>Barry McMahon | Traffic and Transporation Assessment, Roads Design and Consulting Engineers |
| 13 | **Material Assets – Waste and Utilities** | DNV, 3D Core C, The Plaza, Park West, D12F9TN<br><br>Darragh Grant and Michelle Gaffney | Multidisciplinary Planning and Environmental Consultants |
| 14 | **Archaeology and Cultural Heritage** | John Cronin and Associates, No. 3A Westpoint Trade Centre, Ballincollig, Co. Cork<br><br>Martin McGonigle | Archaeology and Heritage Consultancy |
| 15 | **Risk Management** | DNV, 3D Core C, The Plaza, Park West, D12F9TN<br><br>Laura Griffin | Multi-disciplinary environmental, planning and heritage resource management consultancy |
| 16 | **Interactions** | DNV, 3D Core C, The Plaza, Park West, D12F9TN<br><br>Aisling Jones | Multidisciplinary Planning and Environmental Consultants |
| 17 | **Mitigation and Monitoring** | DNV, 3D Core C, The Plaza, Park West, D12F9TN<br><br>Darragh Grant | Multidisciplinary Planning and Environmental Consultants |
| NTS | Non-Technical Summary | Input from all above consultants and compiled by DNV | Multidisciplinary Planning and Environmental Consultants |
| App | Appendices | | |

## 1.3 Purpose of the Environmental Impact Assessment and the Environmental Impact Assessment Report

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 effects.

Under Schedule 5 of the Planning and Development Regulations 2001 (S.I. No. 600/2001), as amended (the Planning Regulations), an EIAR is required to accompany certain planning applications for specified projects as part of the EIA process.

The EIAR describes the outcomes of the iterative EIA process which was progressed in parallel with the project design process. In doing so, it forms the first part of the EIA process that will be completed by Galway City Council (GCC), as 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).[1]

Where significant and likely environmental effects are identified that may be unacceptable, the EIA process aims to identify, describe, and evaluate these effects. In accordance with EPA Guidelines, appropriate mitigation measures will be implemented to avoid, prevent, reduce, or offset such effects, ensuring that any residual impacts are reduced to a permissible and acceptable level. Where necessary, subsequent monitoring will be undertaken to verify the effectiveness of these measures.

[1] European Commission (2014) Directive 2014/52/EU (Online) Available at : https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0052&from=EN

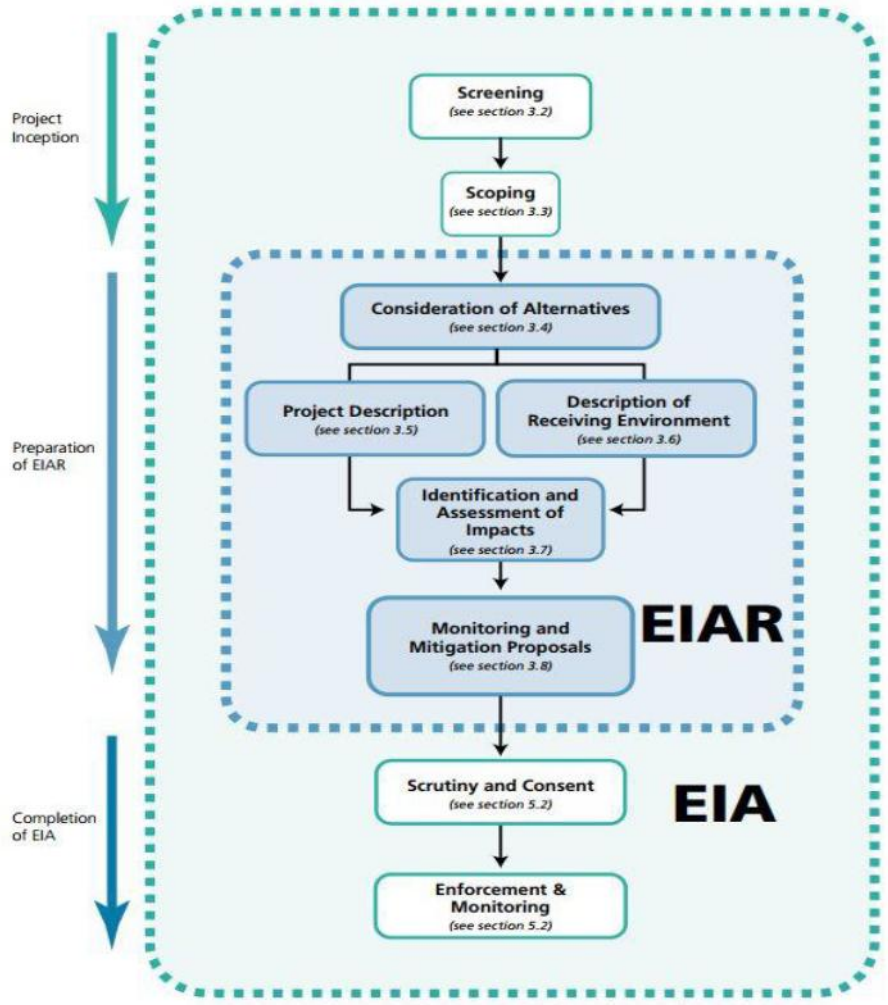



*Figure 1-1 EIA Process*

The purpose of the EIAR is to provide the Local Planning Authority with information on the likely and significant effects on the environment. This EIAR was prepared in parallel with the project design process and reflects the potential cumulative effect of other developments.

## 1.4 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.

## 1.5 EIA Guidance Used

This EIAR has been prepared in accordance with 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 2022);
- Environmental Assessments of Plans, Programmes and Projects – Rulings of the Court of Justice of the European Union (European Union 2020)

- 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);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Environment, Community and Local Government 2013);
- 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);
- 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) (Department of Housing, Planning and Local Government, 2018);
- Revised Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government 2018);
- Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions (European Communities 1999); and
- Implementation of Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (European Communities 2003).

  Article 1(2)(g) of the EIA Directive defines the 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*".

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)

## 1.6 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.

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 - Infrastructure projects*
>
> *10. (b) (i) Construction of more than 500 dwelling units.*

The Proposed Development includes 356 no. residential units which is below the threshold of 500 units for a mandatory EIA. The Proposed Development, therefore, does not exceed the threshold for Part 2, Section 10 (b)(i).

> *Schedule 5, Part 2 - Infrastructure projects*
>
> *10. (b)(iv) Urban development which would involve an area greater than 2 hectares in the case of a business district, 10 hectares in the case of other parts of a built-up area and 20 hectares elsewhere.*
>
> *(In this paragraph, "business district" means a district within a city or town in which the predominant land use is retail or commercial use.)*

The Proposed Development constitutes an "*urban development*" as it is a housing development. According to the Interpretation of Definitions of Project Categories of Annex I and II Document (European Commission, 2015), "*Housing developments, in particular, are frequently included in the 'urban development projects' category*". While not all housing developments are automatically classified as urban development, the location of the Proposed Development within the Galway City boundary, its scale, and its context within a strategic regeneration area support its classification as such.

The site falls outside the interpretation of a business district, which is predominantly a retail and commercial area, as the existing land use was previously industrial. It is not predominantly retail or commercial (office, light industrial), typically associated with a central business district.

However, as a precautionary measure, a 2-hectare threshold has been considered for the purposes of this EIAR due to the proximity of the city centre, the Ceannt mixed-use developments, the former industrial use of the site/ongoing industrial commercial operations in the immediate area and the future regeneration policy underpinning the site.

The site is approximately 1.621 hectares. Notwithstanding the fact that the size of the Proposed Development site and the number of units proposed are below the respective EIAR thresholds, the Applicant is cognisant of the broad interpretation of the EIA Directive and is inviting the competent authorities to determine that an EIAR is required to be submitted with the application for development consent. This decision is based on the potential cumulative impact of the development, considering Ceannt and the cumulative impact in the context of the Galway Inner Harbour masterplan, and the precautionary principle.

Based on pre-application meetings with GCC, it has been confirmed that it is their position that an EIAR is a requirement for the site. Schedule 5, Part 2 of the Planning Development Regulations 2001 (as amended) includes the following provision in relation to sub-threshold development:

> *15. Any project listed in this Part which does not exceed a quantity, area or other limit specified in this Part in respect of the relevant class of development, but which would be likely to have significant effects on the environment, having regard to the criteria set out in Schedule 7.*

Schedule 7 of the Planning and Development Regulations 2001 (as amended) sets out the criteria for determining whether Developments listed in part 2 of Schedule 5 should be subject to an EIA. These include the following:

***1. Characteristics of Proposed Development***

*The characteristics of the Proposed Development, in particular:*

*(a) the size of the whole Proposed Development;*
*(b) cumulation with other existing development and/or development the subject of a consent for Proposed Development for the purposes of section 172(1A)(b) of the Act and/or development the subject of any development consent for the purposes of the Environmental Impact Assessment Directive by or under any other enactment;*
*(c) the nature of any associated demolition works;*
*(d) the use of natural resources, in particular land, soil, water and biodiversity;*
*(e) the production of waste;*
*(f) pollution and nuisances;*
*(g) the risk of major accidents, and/or disasters which are relevant to the project concerned, including those caused by climate change, in accordance with scientific knowledge, and;*
*(h) the risks to human health (for example, due to water contamination or air pollution).*

***2. Location of Proposed Development***

*The environmental sensitivity of geographical areas likely to be affected by proposed development, having regard in particular to:*

*(a) the existing and approved land use;*
*(b) the relative abundance, availability, quality and regenerative capacity of natural resources (including soil, land, water and biodiversity) in the area and its underground;*

*(c) the absorption capacity of the natural environment, paying attention to the following areas:*
*(i) wetlands, riparian areas, river mouths;*
*(ii) coastal zones and the marine environment;*
*(iii) mountain and forest areas;*
*(iv) nature reserves and parks;*
*(v) areas classified or protected under national legislation; Natura 2000 areas designated by Member States pursuant to Directive 92/43/EEC and Directive 2009/147/EC;*
*(vi) areas in which there has already been a failure to meet the environmental quality standards, laid down in Union legislation and relevant to the project, or in which it is considered that there is such a failure;*
*(vii) densely populated areas; and*
*(viii) landscapes and sites of historical, cultural or archaeological significance.*

***3. Types and characteristics of potential impacts***

*The likely significant effects of projects on the environment must be considered in relation to criteria set out in points 1 and 2 of this Annex, with regard to the impact of the project on the factors specified in Article 3(1), taking into account:*
*(a) the magnitude and special extent of the impact (for example geographical area and size of the population likely to be affected);*
*(b) the nature of the impact;*
*(c) the transboundary nature of the impact;*
*(d) the intensity and complexity of the impact;*
*(e) the probability of the impact;*
*(f) the expected onset, duration, frequency and reversibility of the impact;*
*(g) the cumulation of the impact with the impact of other existing and/or development the subject of a consent for proposed development for the purposes of section 172(1A)(b) of the Act and/or development the subject of any development consent for the purposes of the Environmental Impact Assessment Directive by or under any other enactment, and;*
*(h) the possibility of effectively reducing the impact.*

The Proposed Development falls below the thresholds set out in Class 10 of Part 2 of Schedule 5 of the Planning and Development Regulations 2001 (as amended) and is therefore considered a sub-threshold development for the purposes EIA.

In accordance with Section 172 of the Planning and Development Act 2000 (as amended) and having regard to Schedule 7, the nature and location of the Proposed Development, together with the environmental sensitivity of the site, it was deemed appropriate to prepare and EIAR to support the planning application.

Additionally, Article 299A of the Planning and Development Regulations 2001 (as amended) notes that *'Where a planning application for a sub-threshold development is accompanied by an EIAR and a request for a determination under section 7(1)(a)(i)(I) of the Act of 2016 was not made, the application shall be dealt with as if the EIAR had been submitted in accordance with section 172(1) of the Act'.*

## 1.7 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".*

Section 7(1)(b) of the Planning and Development (Housing) and Residential Tenancies Act 2016 (as amended) states that a request for scoping may be submitted to An Bord Pleanála, however this is not mandatory. Article 5(2) of the 2014 Directive states that European Member States may decide that competent authorities should give a scoping opinion mandatorily, notwithstanding whether or not the developer requests. However, the transposition of this provision is optional and the consultation paper from the Department indicates that it is not intended to introduce mandatory scoping.

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 Galway City Development Plan 2023-2029;
- Relevant Regional and National Planning Policy Documents;
- The receiving environment and any vulnerable or sensitive local features and current uses;
- Relevant planning history and applications that have been submitted on the subject and adjoining lands;
- The likely and significant effects of the Proposed Development on the environment; and
- Available mitigation measures for reducing or eliminating any potentially significant undesirable effects.

In addition, the individual chapters of this EIAR should be referred to for further information on the documents consulted by each individual specialist consultant. These include supporting technical reports prepared by relevant experts, such as engineering assessments, flood risk assessments, traffic studies, and other specialist inputs that have informed the EIAR chapters.

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.

## 1.8 Purpose and Objective of the EIAR

The purpose of this EIAR is to assist in the EIA process, by identifying likely significant environmental effects 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 effects 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 effects on the environment, if any.

## 1.9 Format and Structure of this 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. The assessment also considers cumulative effects.

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' 2022[2] as shown in Table 1-2.

*Table 1-2 Description of Effects*

| Category | Type and Description |
|---|---|
| **Quality of Effects**<br>It is important to inform the non-specialist reader whether an effect is positive, negative or neutral. | **Positive Effects**<br>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). |
| | **Neutral Effects**<br>No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error. |
| | **Negative/Adverse Effects**<br>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**<br>'*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 *(also see Determining Significance).* | **Imperceptible**<br>An effect capable of measurement but without significant consequences. |
| | **Not Significant**<br>An effect which causes noticeable changes in the character of the environment but without significant consequences. |
| | **Slight Effects**<br>An effect which causes noticeable changes in the character of the environment without affecting its sensitivities. |
| | **Moderate Effects**<br>An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends. |

[2] https://www.epa.ie/publications/monitoring--assessment/assessment/EIAR_Guidelines_2022_Web.pdf

| Category | Type and Description |
|---|---|
| | **Significant Effects**<br>An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment. |
| | **Very Significant**<br>An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment. |
| | **Profound Effects**<br>An effect which obliterates sensitive characteristics. |
| **Describing the Extent and Context of Effects**<br><br>Context can affect the perception of significance. It is important to establish if the effect is unique or, perhaps, commonly or increasingly experienced. | **Extent**<br>Describe the size of the area, the number of sites and the proportion of a population affected by an effect. |
| | **Context**<br>Describe whether the extent, duration or frequency will conform or contrast with established (baseline) conditions. |
| | **Likely Effects**<br>The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented. |
| | **Unlikely Effects**<br>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**<br><br>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 balance of risk over advantage when making a decision. | **Likely Effects**<br>The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented. |
| | **Unlikely Effects**<br>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**<br><br>*'Duration'* is a concept that can have different meanings for different topics – in | **Momentary Effects**<br>Effects lasting from seconds to minutes. |
| | **Brief Effects**<br>Effects lasting less than a day. |
| | **Temporary Effects** |

| Category | Type and Description |
|---|---|
| the absence of specific definitions for different topics the following definitions may be useful. | Effects lasting less than a year. |
| | **Short-term Effects**<br>Effects lasting one to seven years. |
| | **Medium-term Effects**<br>Effects lasting seven to fifteen years. |
| | **Long-term Effects**<br>Effects lasting fifteen to sixty years. |
| | **Permanent Effects**<br>Effects lasting over sixty years. |
| | **Reversible Effects**<br>Effects that can be undone, for example through remediation or restoration. |
| | **Frequency of Effects**<br>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)**<br>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**<br>The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects. |
| | **'Do-nothing Effects'**<br>The environment as it would be in the future should the subject project not be carried out. |
| | **'Worst-case' Effects**<br>The effects arising from a project in the case where mitigation measures substantially fail. |
| | **Indeterminable Effects**<br>When the full consequences of a change in the environment cannot be described. |
| | **Irreversible Effects**<br>When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost. |
| | **Residual Effects**<br>The degree of environmental change that will occur after the proposed mitigation measures have taken effect. |
| | **Synergistic Effects**<br>Where the resultant effect is of greater significance than the sum of its constituents (e.g. combination of SOx and NOx to produce smog) |

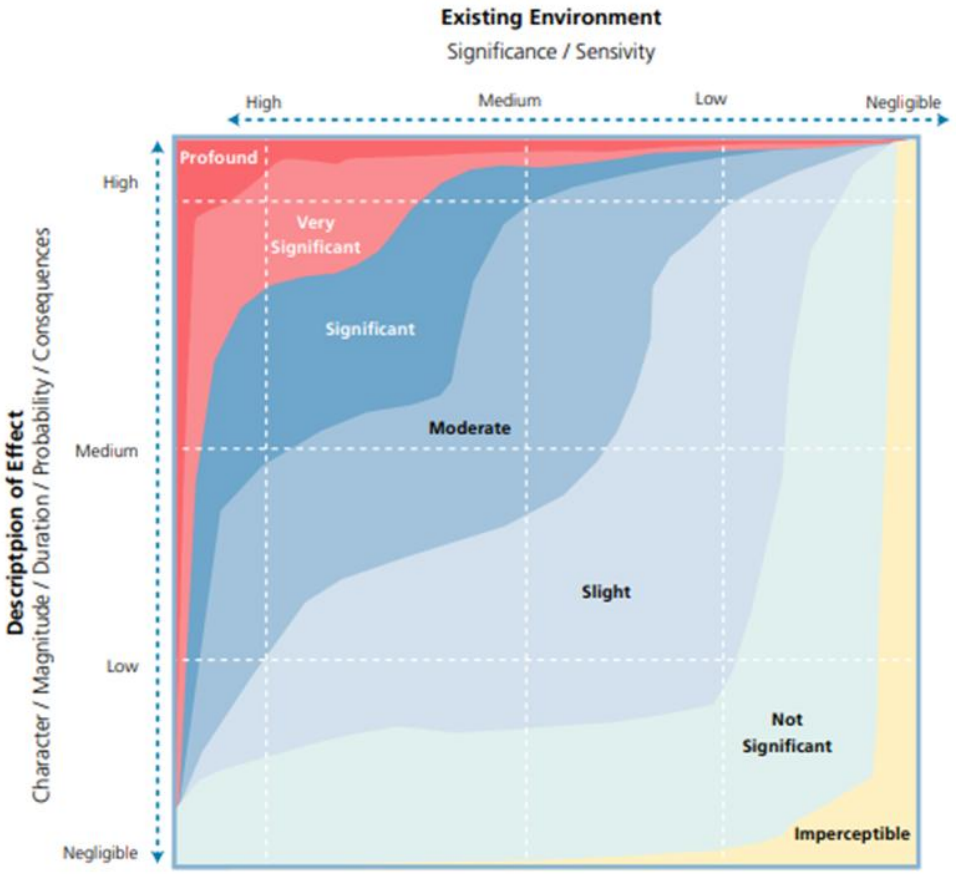



*Figure 1-2 :Determining the Significance of the Effect (EPA 2022)*

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;
- Hydrology and Hydrogeology;
- Air Quality;
- Climate;
- Noise and Vibration;
- Landscape and Visual;
- Material Assets (Traffic, Utilities and Waste Management);
- Cultural Heritage (Archaeology and Built Heritage);
- Landscape and Visual;
- Risk Management;
- Interactions; and
- Mitigation and Monitoring.

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.

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

| Chapter | Title | Content |
|---|---|---|
| 1 | Introduction and General Methodology | Chapter 1 sets out the introduction, the site description, the general methodology and approach to the EIAR. |
| 2 | Description of the Proposed Development and Assessment of Alternatives | As required under Article 5(1)(a) of the EIA Directive, Chapter 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. |
| 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 | 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 effects on landscape caused by the Proposed Development. |
| 12 | Material Assets: Traffic and Transport | Chapter 12 covers the traffic and transport assessment. |
| 13 | Material Assets: Utilities and Waste Management | Chapter 13 covers the requirement under Article 3(1)(d) of the EIA Directive to assess potentially significant effects on material assets. This chapter will identify effects on existing utilities and infrastructure from the development of the Proposed Development. |

| Chapter | Title | Content |
|---|---|---|
| 14 | Archaeology and Cultural Heritage | Chapter 14 covers the requirement under Article 3(1)(d) of the EIA Directive to assess potentially significant effects on cultural heritage. |
| 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. |
| 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 | Mitigation and Monitoring | 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/effect descriptions to provide an appropriate evaluation of each environmental topic under consideration.

## 1.10 Methodology Used to Produce this EIAR

The methodology employed to produce this EIAR is detailed in Table 1-4. 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 effects 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 and up to date 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. |
| Study Methodology | This subsection outlines the method by which the relevant impact assessment has been conducted within that chapter. |

| Chapter | Description of Section |
|---|---|
| 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 '*Characteristics of the Proposed Development'* allows for a projection of the '*level of impact'* on any particular aspect of the environment that could arise.<br>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 Effect 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 effects.<br>The assessment addresses whether the effects are direct, indirect, secondary or cumulative in nature. It also looks at the timescale of such effects 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 effects. The impact interactions are also addressed. |
| Residual Effects 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 Effect | 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 effects upon the receiving environment should the Proposed Development not take place. |
| 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 effects 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 effects identified. |

| Chapter | Description of Section |
|---|---|
| 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 effect to the environment. |
| Interactions | This section provides a description of impact interactions together with potential indirect, secondary and cumulative effects. |
| Difficulties Encountered in Compiling Information | The EIA Directive requires that the EIAR includes *'details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information, and the main uncertainties involved'* (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. |

Each technical chapter of this EIAR has assessed the potential environmental effects of the Proposed Development in accordance with the EIA Directive. The outcome of these assessments is that no significant effects have been identified. Where effects are described using qualitative terms such as "Slight" or "Moderate," the relevant chapters provide clear justification that these effects are not considered significant in the context of the Directive. This ensures that the EIAR presents a clear and unambiguous determination of the significance of predicted effects.

## 1.11 EIAR 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 effects of projects prior to a decision being made by An Bord Pleanála. A Non-Technical Summary of the EIAR has therefore been prepared which summarises the key environmental effects and is provided as a separately bound document.

## 1.12 Links between EIAR and Appropriate Assessment

A screening report for Appropriate Assessment (AA) has been carried out for the Proposed Development to determine if there is a risk of effects to any Natura 2000 site (DNV, 2025). The AA Screening concluded that "*upon the examination, analysis and evaluation of the relevant information and applying the precautionary principle, it is concluded by the authors of this report that the possibility cannot be excluded that the Proposed Development will have a significant effect on any of the European sites listed below:*

- *Inner Galway Bay Special Protection Area (SPA) (004031)*
- *Galway Bay Complex Special Area of Conservation (SAC) (000268)*
- *Lough Corrib SAC (000297)*
- *Lough Corrib SPA (004042)"*

Consequently, a Natura Impact Statement (NIS) has been prepared for the Proposed Development.

Avoidance, design requirements and mitigation measures have been set out in the NIS and their implementation will ensure that effects on the conservation objectives of European sites will be avoided during the construction and operational Phases of the Proposed Development such that there will be no adverse effects on any European sites

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.

This chapter provides signposting to the AA Screening and NIS, while the biodiversity chapter draws on these reports where relevant.

## 1.13 Availability of EIAR Documents

A physical copy of this EIAR document, its associated appendices, and Non-Technical Summary can be available to view or for purchase from the GCC planning office at a fee not exceeding the reasonable cost of reproducing the document.

Digital copies of the EIAR, including all associated documentation, are also available online via the Galway City Council Planning Portal (https://www.galwaycity.ie/planning/online-planning-system) and on the dedicated Large-scale Residential Development (LRD) application website (https://www.galwaycity.ie/services/planning/planning-services/large-scale-residential-developments-lrd).

## 1.14 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.

## 1.15 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 effects of the Proposed Development prior to the granting of planning permission.

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 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 PROPOSED DEVELOPMENT

## 2.1 Introduction

This chapter provides a description of the Proposed Development together with details of the existing environment. In accordance with Article 5(1)(a) of the EIA Directive 2011/92/EU as amended by Directive 2014/52/EU, 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 Competence

This chapter was prepared by Laura Griffin, Environmental Consultant at DNV. Laura has a Master of Science (Hons) degree in Climate Change from Maynooth University and a Bachelor of Arts (Hons) degree in English and Geography from Maynooth University. Laura has 5+ years of professional experience. Laura has experience preparing Environmental Impact Assessment (EIA) Screening Reports and a EIAR chapters for developments of a similar scale and nature to the Proposed Development.

This report was reviewed by Grainne Ryan, Principal EIA Consultant at DNV. Gráinne is an Environmental Consultant with over 11 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 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.

## 2.2 Site Location and Description

The site of the Proposed Development is approximately 1.621 hectares and is located within the existing operational area of Galway Port at Dock Road and Lough Atalia Road, Galway City. The site also extends to include parts of Dock Road and Lough Atalia Road to the southwest and northwest, respectively for road infrastructure works and water services and infrastructure works.

The site is somewhat irregular in shape and is generally bound by the Lough Atalia inlet/outlet to the east; by Dock Road to the south and southwest; and by lands in use for port activities and as a service station to the west. The site extends to include part of Lough Atalia Road and Dock Road for road infrastructure and water services infrastructure works.

The site is currently used for storage of wind turbine parts and bus parking, with the depot building for the latter present at the site's northeastern extent. Previously, it was used as a fuel storage compound with tanks for petrol, diesel and kerosene, although these features have been removed to ground level. Structures currently on-site include a 2-storey office-type building at the site's northern extent (the aforementioned bus depot), a single-storey sub-station building to the southwest (understood to be a substation) and a pump-station to the south (adjacent to the bridge traversing the Lough Atalia inlet/outlet).

Figure 2-1 shows a drawing for the site location. For further reference, Appendix 2-1 provides an additional site layout drawing that complements the information presented here.

Galway Bay Complex Special Area of Conservation (SAC) (000268) and Inner Galway Bay Special Protection Area (SPA) (004031) are adjoining the Proposed Development site boundary, while Lough Corrib SAC (000297) is located directly downstream of the site.

While mapping data indicates some overlap with the Annex I - 1130 estuaries habitat (see Figure 2-2), this is considered a digitisation[1] [2]error, as the site comprises built land and does not support any Qualifying Interest (QI) habitats associated with these designated European sites.

In reality, the site is characterised by artificial surfaces, disturbed ground, and species-poor vegetation, and is not functionally connected to the surrounding SACs or SPAs. This confirms that the site does not support habitats of European conservation importance.

[1] Special Area of Conservation (SAC) boundaries provided by the National Parks and Wildlife Service (NPWS) are currently presented in the Irish Transverse Mercator (ITM) projection. Most boundaries were originally digitised from Ordnance Survey of Ireland 1:10,560 six-inch raster mapping in the Irish Grid projection. While suitable for general planning and assessment, these legacy boundaries may contain minor inaccuracies such as gaps, overlaps, or misalignments, particularly near county borders. NPWS is actively updating SAC boundaries using modern 1:5,000 OSI vector mapping in ITM. These revised boundaries will be formalised through Statutory Instruments (SIs) as they are completed. Over time, the dataset will increasingly reflect this improved spatial accuracy.

[2] Reference: National Parks and Wildlife Service (NPWS). Download Boundary Data – Designated Site Data.
Available at: https://www.npws.ie/maps-and-data/designated-site-data/download-boundary-data

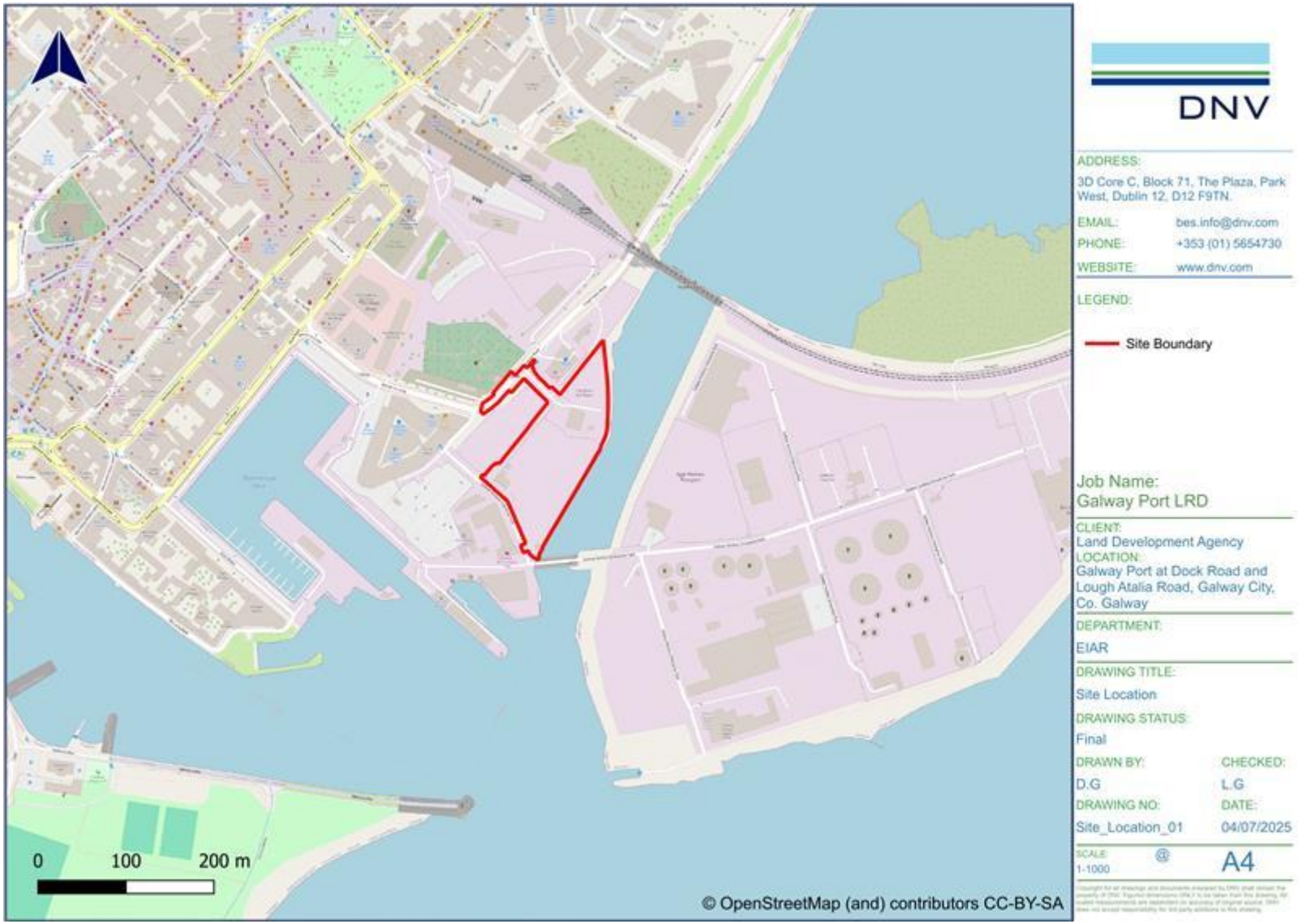



*Figure 2-1 Site Location*

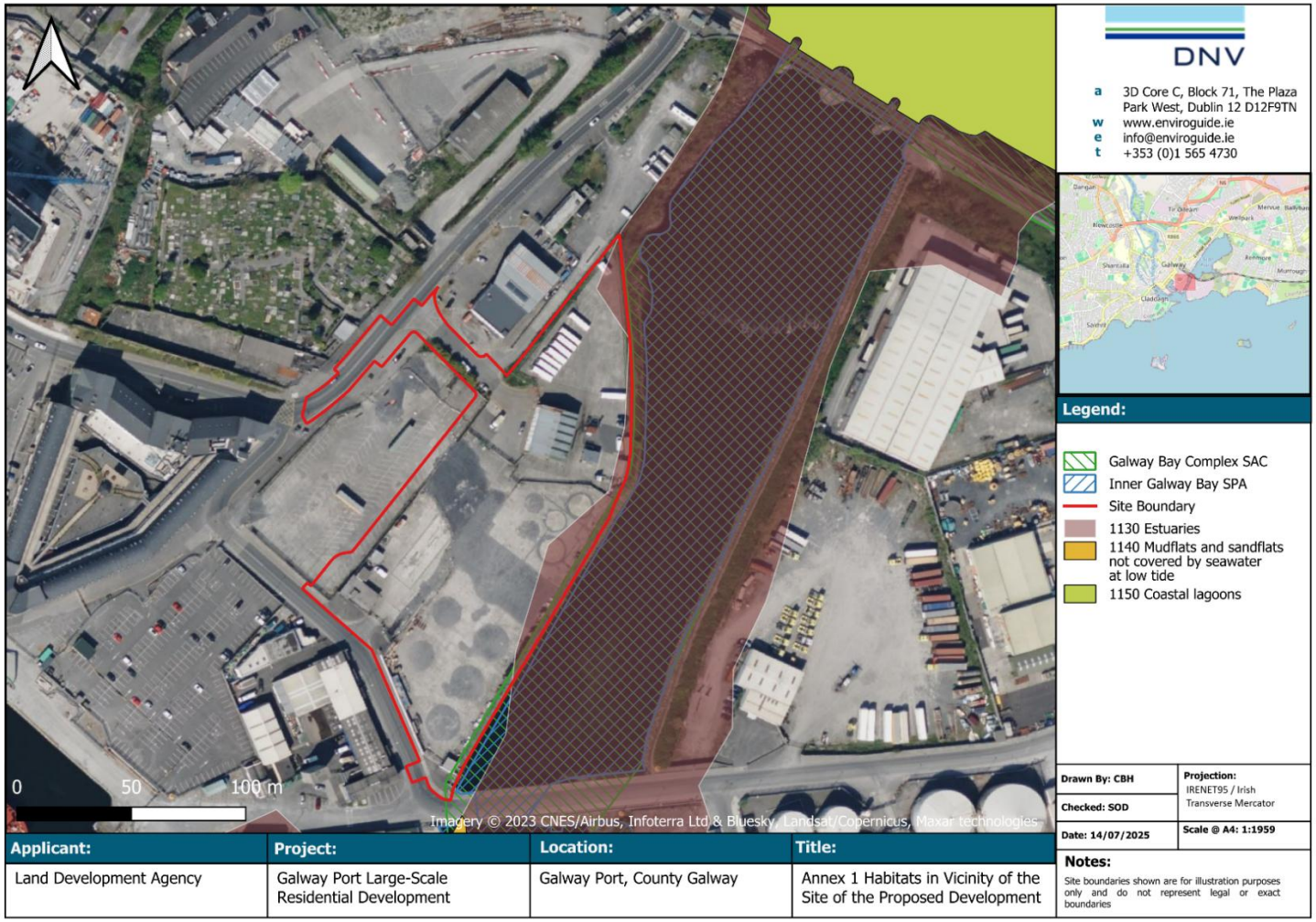



*Figure 2-2 Annex 1 Habitats in Vicinity of the Proposed Development (QGIS, 2025)*

## 2.3 Site Background and Site History

According to the Galway City Council's Public Planner Viewer webpage and the National Planning Application Database, there are no recent planning applications pertaining to the site. However, 3 no. older applications are listed in Table 2-1.

The developments listed in Table 2-1 relate to the historic use of the site in terms of port and industrial activity, or ancillary (signage) development.

Under the Galway City Development Plan (2023-2029) (Galway City Council (GCC), 2023), the site is principally zoned by the Development Plan as 'CC-City Centre', with the following objective assigned:

*"To provide for city activities and particularly those, which preserve the city centre as the dominant commercial area of the city."*

A small area of the site at Lough Atalia Road is technically unzoned due to its road/transportation 'use'. Development proposed thereat is limited to roads related and water infrastructure works.

A summary of the planning history at the site is summarised in Table 2-1.

### 2.1.1 Planning History for the Site of the Proposed Development

*Table 2-1 Site Planning History*

| Application Registration Reference | Address | Development Proposal | Decision |
|---|---|---|---|
| GCC Reg. Ref.: 97575<br><br>Mike and Eleanor O'Boyle | Leeside Oil Terminal, Lough Atalia Road, Galway | Permission to extend facilities at existing oil terminal site by construction of five additional bunded storage tanks, a truck loading gantry and site drainage improvement. | Grant Permission<br><br>12/03/1998 |
| GCC Reg. Ref.: 03695<br><br>Statoil Ireland Ltd | Lough Atalia Road, Galway | Permission to erect a two-storey permanent prefabricated portacabin to accommodate offices and driver welfare facilities. | Grant Permission<br><br>12/02/2004 |
| GCC Reg. Ref.: 07421<br><br>EZ Living | Galway Harbour Enterprise Park, Renmore, Galway | Permission for retention of 3 no. existing signs at the following locations:<br><br>1) Entrance to EZ Living at Enterprise Park;<br>2) Main entrance to Enterprise Park; and<br>3) Eastern elevation of the building. | Grant Permission<br><br>24/08/2007 |

## 2.4 Description of the Proposed Development

The Proposed Development principally consists of:

- The demolition of the existing office / bus depot building (370.2 sq m) and ancillary building (26.0 sq m);
- The partial demolition of the existing ESB sub-station and ancillary building (67.4 sq m);
- The demolition of existing boundary walls at the south-west and north-west; and
- The construction of a mixed-use development.

The proposed mixed-use development primarily comprises:

- 356 No. residential apartments (172 No. 1-bed, 169 No. 2-bed and 15 No. 3-bed);
- Crèche (255.9 sq m);
- 2 No. café/restaurant units (totalling 428.4 sq m) and 1 No. retail unit (156.0 sq m).

The Proposed Development has a total floor area of 32,096.0 sq m and is primarily proposed in 4 No. blocks (identified as A–D) that generally range in height from 6 No. to 13 No. storeys: Block A ranges from 6 No. to 9 No. storeys; Block B ranges from 6 No. to 11 No. storeys; Block C is 6 No. storeys; and Block D ranges from 6 No. to 13 No. storeys.

The Proposed Development also includes:

- New internal street and pedestrian network, including a one-way vehicular route at the north-western side of the site and new junctions with Dock Road at the south-west and with the access road from Lough Atalia at the north-west;
- Upgrades to Lough Atalia Road and the access road from it at the north-west of the site, including the provision of a new toucan pedestrian/cycle crossing at Lough Atalia Road; upgrades to the footpath and road interface with Dock Road to the south-west;
- 37 No. car parking spaces;
- 1 No. set-down/delivery bay;
- 741 No. cycle parking spaces;
- Hard and soft landscaping, including as public open spaces and communal amenity spaces;
- Private amenity spaces as balconies and terraces facing all directions; boundary treatments;
- Public lighting;
- Bin stores;
- Double sub-station;
- Plant rooms; green roofs;
- Rooftop lift overruns and plant;
- Rooftop telecommunications, plant and enclosure at Block C;
- Recladding of the existing sub-station and pumping station; and
- All associated works above and below ground.

The proposed site layout is detailed in Figure 2-3. This figure is included in Appendix 2-2, for further reference.




*Figure 2-3 Proposed Site Layout (Altu Architects, 2025)*

## 2.5 Construction of the Proposed Development

The Proposed Development will be executed in three distinct phases to facilitate a staged completion and occupation. The proposed sequence of construction outlined below is subject to confirmation once the building contract has been awarded and on completion of the Detailed Construction Management Plan for agreement with GCC. The duration of the demolition phase is anticipated to span approximately 3 months, and the overall construction phase is anticipated to span approximately 27 months, starting with Blocks A and B, followed by Blocks C and D.

The Proposed Development comprises:

- 356 No. residential apartments, comprising of:
    - 172 No. 1-bed units;
    - 169 No. 2-bed units;
    - 15 No. 3-bed units;
- Crèche (255.9 sq m);
- 2 No. café/restaurant units (totalling 428.4 sq m);
- 1 No. retail unit (156.0 sq m);
- Total floor area: 32,096.0 sq m;
- Block heights:
    - Block A: 6 to 9 storeys
    - Block B: 6 to 11 storeys
    - Block C: 6 storeys
    - Block D: 6 to 13 storeys

**Demolition Phase (Approximately 3 months):**

- Demolition of the existing office / bus depot building (370.2 sq m) and ancillary building (26.0 sq m);
- Partial demolition of the existing ESB sub-station and ancillary building (67.4 sq m); and
- Demolition of existing boundary walls at the south-west and north-west of the site.

**Construction Phase 1 (Approximately 15 months):**

- Construction of Blocks A and B (186 no. units);
- Road works along Dock Road;
- New internal street and parking court;
- Upgrade of road adjacent to petrol filling station;
- Installation of toucan crossing and associated footpath; and
- Landscaping around public square, courtyard and Lough Atalia Walk.

**Construction Phase 2 (Approximately 12 months):**

- Construction of Blocks C and D (170 no. residential units); and
- Completion of landscaping, including the remainder of Lough Atalia Walk.




*Figure 2-4 Phasing Plan (Altu Architects, 2025)*

## 2.6 Operational Phase

Upon completion, the Proposed Development will be occupied and operated as a residential-led scheme comprising 356 No. residential apartments, a crèche, café/restaurant units, retail space, and associated open spaces. The operational phase will include typical residential activities such as domestic waste collection, energy and water usage, maintenance of communal areas, and resident and visitor movement to and from the site. Operational phase effects have been assessed throughout the EIAR and, subject to the implementation of proposed mitigation and management measures, no significant adverse effects are predicted during the operation of the Proposed Development.

## 2.7 Cumulative Schemes

Cumulative effects are considered in this EIAR in line with Section 3.7.3 of the Environmental Protection Agency (EPA) Guidelines on the *Information to be Contained in Environmental Impact Assessment Reports* (2022). It is acknowledged that while a single activity may itself result in a minor effect, it may, when combined with other effects, minor or significant, result in a cumulative effect that is collectively significant. Similarly, a single activity which may on its own have a significant effect, may be reduced to an insignificant effect when combined with other effects.

The EPA Guidelines (2022) state:

> *"The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects. While a single activity may itself result in a minor impact, it may, when combined with other impacts (minor or insignificant), result in a cumulative impact that is collectively significant. For example, effects on traffic due to an individual industrial project may be acceptable; however, it may be necessary to assess the cumulative effects taking account of traffic generated by other permitted or planned projects. It can also be prudent to have regard to the likely future environmental loadings arising from the development of zoned lands in the immediate environs of the proposed project."*

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

The following selection criteria has been applied when identifying schemes with the potential to cause likely cumulative effects.

1. Status of the Projects:
    - Existing: Projects that have been granted planning permission and are being constructed;
    - Approved: Projects that have been granted planning permission but not yet built; and
    - Reasonably Foreseeable: Projects that have been applied for but are not yet consented (adopting a more precautionary "reasonably foreseeable" approach).
2. Proximity to the Proposed Development:

- All projects adjacent or within 100m of the Proposed Development, regardless of if size or use.

3. Scale of Development:
    - Projects that are EIAR developments or projects that exceed the following thresholds:
        - Residential: Developments comprising more than 150 residential units;
        - non-residential commercial projects over 10,000 square metres of floor space; and
        - Infrastructure developments (roads, flood defences) over 1km distance.
4. Wider Area Consideration
    - Projects meeting the criteria outlined in Point 3 and located within a 2km radius of the Proposed Development site.

*Table 2-2 List of Cumulative Schemes*

| No. | Application Reg. Ref. | Address | Development Proposal | Decision Date |
|---|---|---|---|---|
| 1 | **GCC Reg. Ref. 2460108 (ABP/ACP Ref. 320100)** | Corner of Lough Atalia Road and Bóthar na Long, Galway, H91 HY45 | The development will include demolition of a vacant industrial structure (115 sq m), the external canopy structure (170 sq m) and the boundary walls along the southern, western and north-western boundaries of the site; and the construction of a 15 No. storey hotel (including part mezzanine at ground floor level) providing 189 No. bedrooms (7,514 sq m), incorporating food and beverage areas and provision of a single storey service building to the northwest of the site on a 0.2217 Ha site. | Lodged 15/04/2024<br>Refused Permission 06/06/2024 (under appeal) |
| 2 | **GCC Reg. Ref. 20/47**<br>**(ABP/ACP Ref. 310568-21)** | Lands to the rear of Ceannt Train Station, Station Road, Galway City | Large-scale, mixed-use development consisting of 376 no. apartments, retail units, café/restaurant/bar units, hotel, office use, childcare facility, car parking and other services and associated site works. | Grant Permission 24/05/2021 |
| 3 | **ABP/ACP Ref. PA0033** | Renmore and Townparks Townlands, Galway | Galway Harbour Extension | Currently awaiting final decision.<br>Decision anticipated by the end of 2025. |
| 4 | **ABP- 314597-22**<br>**Galway City Council** | University Road to Dublin Road, Galway City | BusConnects Galway Cross-City Link Scheme | Grant Permission 27/09/2024 |




*Figure 2-5 Cumulative Projects Surrounding the site*

## 2.8 Description of Alternatives

### 2.8.1 Introduction

This section provides a description of the reasonable alternatives that have been considered.

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 examined throughout the design and consultation process. This serves to indicate the main reasons for choosing the Proposed Development, taking into account and providing a comparison of the environmental effects. The alternatives may be described at four levels:

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

Pursuant to Section 3.4.1 of the 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 considered early in the process or alternative mitigation options may need to be considered towards the end of the process. In this case, an EIAR has been prepared and alternative mitigation measures have been considered and incorporated where relevant.

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 is deciding on the selected option. A detailed assessment (or 'mini-EIA') of each alternative is not required*."

Schedule 6, paragraph 1(d) of the Planning and Development Regulations 2001, as amended, similarly requires:

> "*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."*

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.

### *2.8.2 Alternative Locations*

The EPA Guidelines recognise that it is not always necessary or appropriate to consider alternatives that have already been addressed at a higher level, such as during the plan-making stage.

In this case, the Proposed Development site has been consistently identified for development in earlier iterations of the County Development Plan, most recently in the Galway City Development Plan 2023–2029. It is located within the designated 'Inner Harbour Regeneration Site', which is subject to a masterplan requirement to guide its comprehensive redevelopment. The Development Plan describes the area as follows:

"*It has potential for significant redevelopment providing an opportunity to re-establish links between the city centre and the sea, to create a high-quality waterfront setting, a new city centre mixed use neighbourhood and include for water-related leisure uses. This area is already under transition with the current development of Bonham Quay contributing to the*

*transformation of this part of the city centre and indicating a scale and density that could be achieved in the wider Inner Harbour*."

The inclusion of the site within this regeneration framework reflects a strategic, policy-led decision to prioritise its redevelopment. While the LDA does not own the site, its involvement aligns with its remit to support the delivery of housing and regeneration on strategically located lands, including those in public ownership.

Given the site's long-standing identification for redevelopment and its alignment with national and local planning policy, it is considered appropriate to progress the Proposed Development at this location. The project will optimise the use of underutilised, well-serviced urban land and contribute meaningfully to the regeneration of the wider area. On this basis, the evaluation of alternative locations within the EIAR is not considered necessary.

### *2.8.3 Alternative Uses*

The site is principally zoned by the Development Plan as 'CC-City Centre', *"To provide for city activities and particularly those, which preserve the city centre as the dominant commercial area of the city"*. A small area of the site at Lough Atalia Road is technically unzoned due to its road/transportation 'use'. Development proposed thereat is limited to roads related and water infrastructure works.

The CC zoning facilitates the land-uses identified in Table 2-3. However, the Development Plan provides flexibility in relation to permissible/acceptable uses, emphasising that its priority is the attainment of the zoning's objective. The Plan states:

*"The land use zoning objectives in the chapters of the Development Plan give an indication of the acceptability of new uses in each zone. They are intended as a guideline and are not exhaustive. Under each land use zoning, examples of uses which are compatible with and contribute to the zoning objective are specified. Examples of uses shown as "Uses which may contribute to the zoning objectives, dependent on the location and scale and the proposed development", are uses which may not be considered acceptable in principle in all parts of the relevant land use zoning objective and will only be accepted where the Council is satisfied that the use would not have an undesirable consequence for prevailing use or amenity. A use that is not compatible or does not contribute to the specific land use zoning objective will not be permitted in that land use zone. Uses not cited as examples of uses but which fulfil the land use objective shall be considered in relation to general policy and to the zoning objectives for the area in question. Uses, which are temporary in nature, may be considered by the Council as uses that are compatible and contribute to the zoning objective."*

*Table 2-3 Uses Listed as being (1) Compatible with and (2) Which may Contribute to the City Centre Zoning (Source: Galway City Development Plan 2023-2029 (GCC, 2023)*

| | |
|---|---|
| **Uses which are compatible with and contribute to the zoning objective, for example:** | • Retail;<br>• Residential;<br>• Offices, banks and professional services;<br>• Tourist led uses;<br>• Cultural and community uses;<br>• Buildings for education;<br>• Recreation; |

| | |
|---|---|
| | • Childcare facilities; and<br>• Places of worship. |
| **Uses which may contribute to the zoning objectives, dependent on the CC location and scale of development, for example:** | • Light industry; and<br>• Public utilities. |

The proposed uses are detailed in Table 2-4 alongside a brief justification for their appropriateness at the CC-zoned subject site (Thornton O'Connor Town Planning (hereafter referred to as 'TOC'), 2025).

*Table 2-4 Proposed uses and Compliance with the Site's CC-Zoning Designation (Source: TOC, 2025)*

| Proposed Use | Alignment with the Uses and Objective |
|---|---|
| Residential | Stated as being a use that is compatible with the zoning and will contribute to the zoning objective.<br><br>Will deliver much-needed housing at a city centre location, thereby generating critical mass to support and sustain new and existing businesses and services. This accords with the principles of the '15-minute' city, where residential and non-residential are proximate to each other. |
| Crèche | Falls under 'childcare facilities', which is stated as being a use that is compatible with the zoning and will contribute to the zoning objective.<br><br>Will support community development and will vitally meet the needs of existing and future residents of the area, as well as persons working locally. A key requirement of making city centres attractive places in which to live for families. |
| Café | Not explicitly stated amongst the uses listed above. However, could be considered as falling into the general categories of 'tourist related uses' and 'recreation'.<br><br>Notwithstanding this, the use is compatible with zoning and makes a contribution to it attainment. It will activate and enliven the proposed development, whilst creating an economic and employment opportunities and meeting the dining and socialising needs of new and existing residents. |
| Retail | Stated as being a use that is compatible with the zoning and will contribute to the zoning objective.<br><br>Will actively contribute to the commercial role of the City Centre and meet the basic needs of residents, visitors and workers on-site and in the local area. |

TOC contend that the proposed use-mix is wholly appropriate at the subject site and will support the achievement of the zoning designation's overarching objective. Alternative uses

were not progressed as the proposed mix of residential and childcare uses directly responds to the identified need for housing in Galway City Centre, and complements the existing concentration of offices, banks, professional services, educational buildings, and other civic uses in the surrounding area. The Proposed Development will contribute to a balanced and vibrant city centre, supporting the principles of compact growth and the '15-minute city'.

### *2.8.4 Alternative Design and Layouts*

Following receipt of the Large-scale Residential Development (LRD) Opinion from GCC, the design team engaged in a follow-up meeting to review progress on the Inner Harbour Masterplan and address architectural and urban design concerns raised by the Council. Three alternative site layout iterations were explored:

- Option 1: This option retained the existing building block positions while introducing a new public square between Blocks A and B. Bin stores and substations were integrated within the building footprints, and the north-west car park was redesigned to improve connectivity. However, this layout was ultimately rejected due to ongoing fragmentation issues in the overall site arrangement;
- Option 2: This iteration proposed a significant redesign of Block D into an L-shaped form to activate frontages along the internal street and define a future public square adjacent to the proposed hotel and commercial block. While this option improved spatial enclosure, it reduced the amount of public open space and visual connectivity to the waterfront. It was discounted due to its increased massing and visual impact; and
- Option 3: This option involved a modest realignment of a building block to front the internal street rather than the waterfront promenade. It better aligned with the wider masterplan, promoting permeability and a continuous connection from Lough Atalia Park through the site. This layout was generally accepted by the Council and selected for further development.

**Environmental Implications of Design Alternatives**

In accordance with the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2022), the applicant is required to describe the reasonable alternatives examined during the design process, with an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects. he environmental implications of the design alternatives are as follows:

- Option 1: Presented minor environmental benefits through the integration of bin stores and substations, which reduced visual clutter and improved waste management. However, the fragmented layout limited pedestrian permeability and ecological connectivity, reducing opportunities for green corridors and biodiversity enhancement;
- Option 2: Improved spatial enclosure and urban definition but resulted in increased massing and overshadowing, particularly impacting views from the adjacent Forthill Cemetery. The reduction in public open space also constrained landscaping potential and biodiversity gains; and
- Option 3, the selected option, offered the most favourable environmental outcomes. It facilitated continuous green infrastructure from Lough Atalia Park, supported active travel, and enhanced ecological connectivity. The improved solar orientation and

permeability contribute to daylight access, thermal comfort, and reduced reliance on private vehicles, aligning with the principles of sustainable urban development.

Figures 2-6 to 2-8 illustrate the three design options considered.




*Figure 2-6 Design Option 1 (Altu Architects, 2025)*

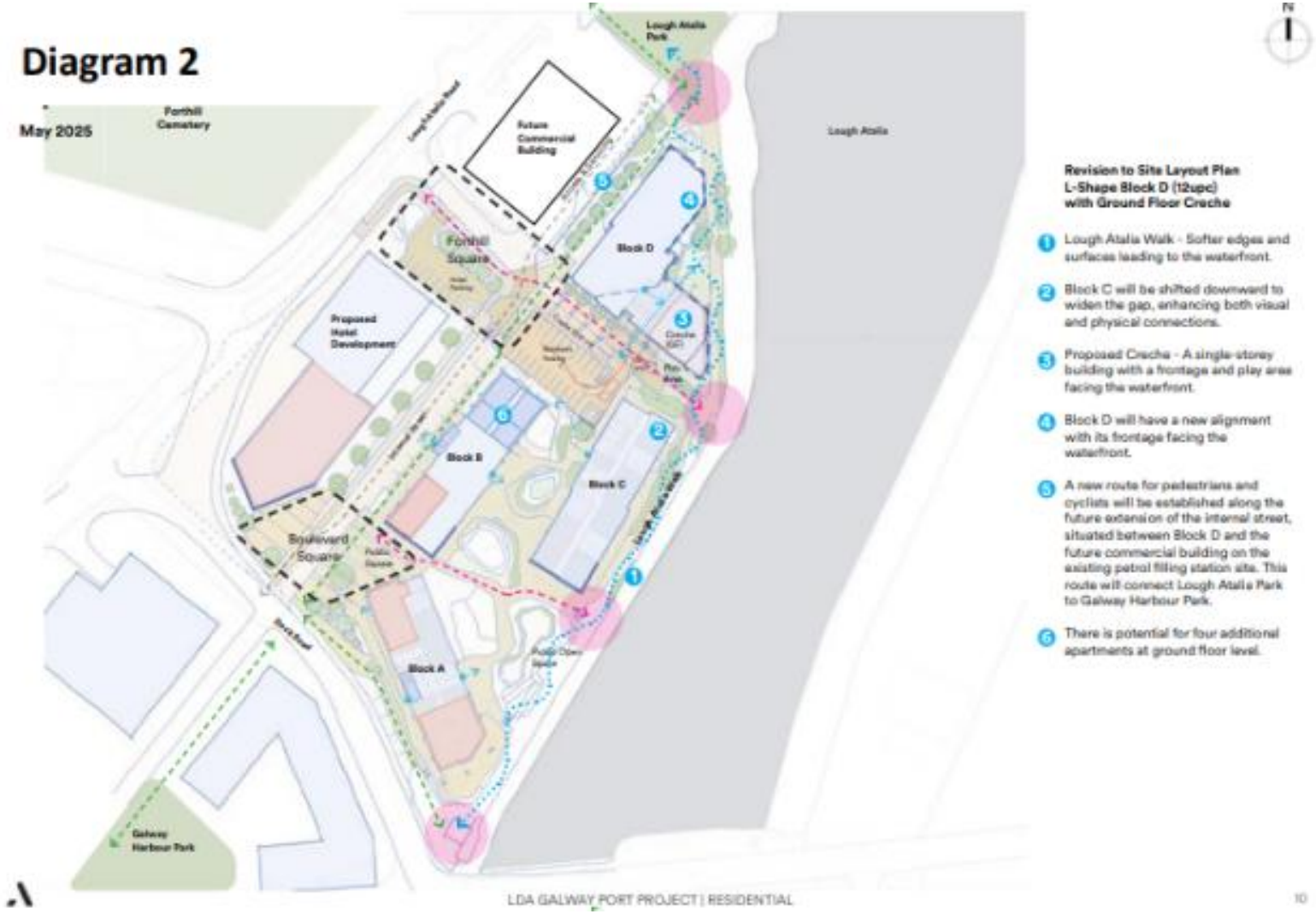



*Figure 2-7 Design Option 2 (Altu Architects, 2025)*

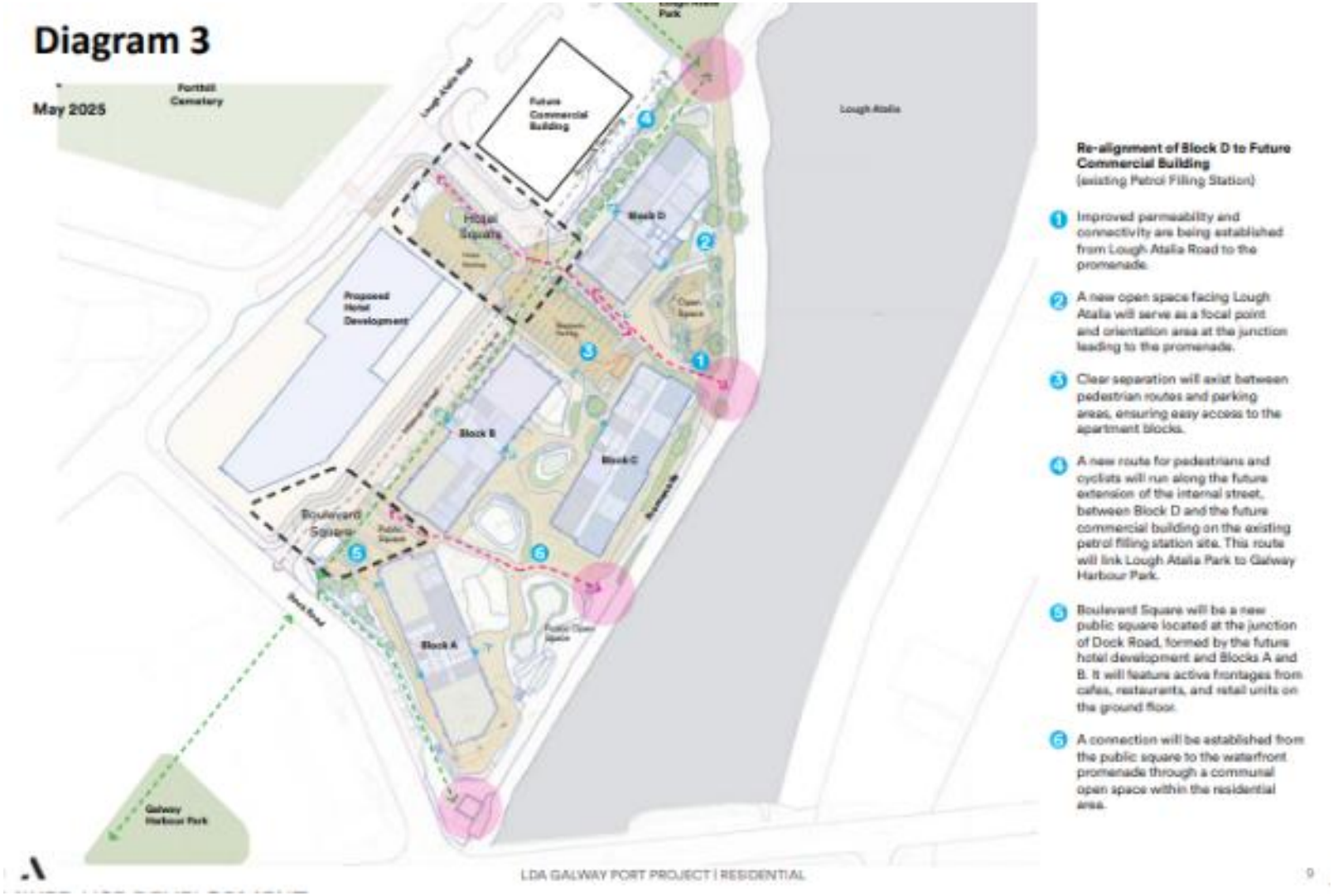



*Figure 2-8 Design Option 3 (Altu Architects, 2025)*

In addition to the three design iterations developed in response to the LRD Opinion, the earlier conceptual layout presented in the Galway Harbour Company's 2021 Vision Document provides a valuable reference point for understanding the consideration and evolution that the Proposed Development has undergone. Early layouts were reconsidered on the basis of environmental considerations, mainly wind.

### *2.8.5 Alternative Process*

Due to the nature of the Proposed Development (i.e. mixed use / primarily residential) where the planning application will be submitted to GCC it was not considered necessary to consider alternative processes for the Proposed Development. Alternative consent mechanisms such as the Strategic Infrastructure Development (SID) process or the Strategic Housing Development (SHD) route were not applicable in this instance. The SID process is reserved for developments of strategic national or regional importance, such as major transport, energy, or port infrastructure, and was not relevant to the scale or nature of the Proposed Development. The SHD process, which previously allowed large-scale residential applications to be submitted directly to An Coimisiún Pleanála (formerly An Bord Pleanála), has since been phased out and replaced by the LRD process. The LRD process was deemed the appropriate planning route, facilitating engagement with the local authority and aligning with current legislative requirements.

## 2.9 The Existence of the Project

The demolition and construction phases will last approximately 30 months in total. During the construction phase of the Proposed Development there will be approximately 100-150 no. jobs created at the peak of construction works. Hence, for the duration of the construction phase of the Proposed Development there will be a short-term increase in construction employment in the area, which will have a positive impact, both directly and indirectly, on the local economy.

This includes consideration of the demolition phase, which precedes construction and involves the removal of existing structures and boundary walls. The potential environmental effects associated with demolition activities, such as noise, dust, and vibration, have been assessed and appropriate mitigation measures proposed.

The operational phase will result in an increase in the population of the area, and it will have a positive impact on the long-term supply needs of housing in Galway City. In addition to housing, the inclusion of a crèche, café/restaurant units, and a retail unit will enhance the local amenities, making the area more attractive and convenient for residents. These facilities will create additional long-term employment opportunities in childcare, hospitality, and retail sectors, further boosting the local economy. Employment will also be created by the maintenance and management of the Proposed Development.

The Proposed Development's design, which includes extensive landscaping, public open spaces, and communal amenity areas, will improve the urban environment, promoting social interaction and community well-being. The upgrades to the pedestrian and cycle networks, along with the provision of ample cycle parking spaces, will encourage sustainable transportation, reducing reliance on cars and contributing to lower carbon emissions. The landscaping strategy will also deliver biodiversity benefits, with the transformation of the site from a predominantly hardcore surface to permeable, planted areas supporting habitat

creation and ecological enhancement. The inclusion of biodiverse planting schemes, including native and pollinator-friendly species, will contribute to improved ecological connectivity and resilience within the urban setting.

Any likely significant environmental effects of the Proposed Development are fully addressed in the relevant specialist chapters of this EIAR. The Proposed Development 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.

On the basis of the foregoing, it is considered that all reasonable alternatives to the Proposed Development are considered, and no alternatives have been overlooked which would significantly reduce or further minimise environmental effects.

Having considered all alternatives, the final design chosen by the developer i.e. the Proposed Development as presented is deemed to be the most suitable project for the site.

# 3 PLANNING CONTEXT

## 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.

### 3.1.1 Quality Assurance and Competence

This chapter has been prepared by Gráinne Ryan, Principal Environmental Impact Assessment (EIA) Consultant at DNV. Gráinne is an Environmental Consultant with 11 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 reviewed by Rachel Redmond, Environmental Consultant with DNV with over 3 years' experience as an Environmental Consultant. Rachel has a Bachelor of Science (Hons) in Environmental Science from University College Cork. Rachel has experience in preparing Environmental Impact Assessment Reports 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 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.

### 3.1.2 Site Location

The site of the Proposed Development is approximately 1.621 hectares and is located within the existing operational area of Galway Port at Dock Road and Lough Atalia Road, Galway City. The site also extends to include parts of Dock Road and Lough Atalia Road to the Southwest and Northwest, respectively for road infrastructure works and water services and infrastructure works.

The site is somewhat irregular in shape and is generally bound to as follows: by the Lough Atalia inlet/outlet to the east, by Rock Road to the south and southwest; and by lands in use for port activities and as a service station to the west. The site extends to include part of Lough Atalia Road and Dock Road for road infrastructure and water services infrastructure works.

The site is currently used for storage of wind turbine parts and bus parking, with the depot building for the latter present at the site's northeastern extent. Previously, it was used as a fuel storage compound with tanks for petrol, diesel and kerosene, although these features have been removed to ground level. Structures currently on-site include a 2-storey office-type building at the site's northern extent (used by a bus company), a 2-storey buildings to the southwest (understood to be a substation and ancillary structure) and a pumphouse to the south (adjacent to the bridge traversing the Lough Atalia outlet).

## 3.2 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 means of process consisting of:

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

*(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; and*

*(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 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)*

The requirement for a statutory 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 (together, the EIA Directive)) as they are deemed as projects which are likely to have a significant effect.

Others, listed in the Schedule 5, Part 2 of the Regulations, contain threshold levels and criteria and for projects that fall below these thresholds and criteria, it is the decision of the competent authority to decide if an EIA (and the associated EIAR) is required.

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***

*(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. In Ireland, while exclusion thresholds exist, projects below these thresholds may still require EIA or Appropriate Assessment (AA) where significant environmental effects are likely, particularly in or near sensitive or Natura 2000 sites.

Schedule 5 of the Regulations, as amended, outlines the legislative requirements deeming whether a project needs a mandatory EIA. Projects that automatically require an EIA included in Annex 1 of the EIA Directive are listed in Part 1 of Schedule 5 to the Regulations.

Projects that are assessed either on a case-by-case examination or on the basis of set mandatory thresholds are defined under Annex II of the EIA Directive, and these are transposed in Irish legislation in Schedule 5, Part 2 of the Planning and Development 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 - Infrastructure projects*

*10. (b) (i) Construction of more than 500 dwelling units.*

The Proposed Development includes 356 no. residential units which is below the threshold of 500 units for a mandatory EIA. The Proposed Development does not exceed the threshold for Part 2, Section 10 (b)(iv).

*Schedule 5, Part 2 - Infrastructure projects*

*10. (b)(iv) Urban development which would involve an area greater than 2 hectares in the case of a business district, 10 hectares in the case of other parts of a built-up area and 20 hectares elsewhere.*

*(In this paragraph, "business district" means a district within a city or town in which the predominant land use is retail or commercial use.)*

The Proposed Development constitutes an "*urban development*" as it is a housing development. According to the Interpretation of Definitions of Project Categories of Annex I and II Document (European Commission, 2015), "*Housing developments, in particular, are frequently included in the 'urban development projects' category*". While not all housing developments are automatically classified as urban development, the location of the Proposed Development within the Galway City boundary, its scale, and its context within a strategic regeneration area support its classification as such.

The site falls outside the interpretation of a business district, which is predominantly a retail and commercial area, as the existing land use was previously industrial. It is not predominantly retail or commercial (office, light industrial), typically associated with a central business district.

However, as a precautionary measure, a 2-hectare threshold has been considered for the purposes of this EIAR due to the proximity of the city centre, the Ceannt commercial developments, and the future regeneration policy underpinning the site.

The site is approximately 1.621 hectares. Notwithstanding the fact that the size of the Proposed Development site and the number of units proposed are below the respective EIAR thresholds, a voluntary EIAR has been prepared to accompany this planning application. This decision is based on the potential cumulative impact of the development, considering Ceannt and the Strategic Infrastructure Development, cumulative impact in the context of the Galway Inner Harbour masterplan, and the precautionary principle.

Based on pre-application meetings with Galway City Council (GCC), it has been confirmed that it is their position that an EIAR is a requirement for the site.

### 3.2.1 Housing for All, 2021

'Housing for All – A New Housing Plan for Ireland' is the Irish Government's national housing strategy aimed at delivering 300,000 new homes by 2030, including private, social, affordable, and cost rental housing. It sets out a comprehensive framework to increase housing supply, improve affordability and promote sustainable urban development.

The Plan introduced key reforms such as the Large-Scale Residential Development (LRD) process, replacing Strategic Housing Developments (SHD), to streamline major housing projects. It also expands the Part V requirement from 10% to 20%, mandating that portion to be allocated to social and affordable housing. Initiatives like Project Tosaigh and Croí Cónaithe (Cities) Fund further support the viability of high-density apartment schemes, particularly in urban centres like Galway.

In the context of EIARs, Housing for All provides a policy backdrop that must be considered. This EIAR for the Proposed Development demonstrates alignment with the Plan's objectives including sustainable land use, compact growth and climate resilience. Developments are expected to incorporate energy-efficient design, support active travel and public transport, as well as contribute to national climate targets.

### 3.2.2 Energy Performance of Buildings Directive (recast) 2024/1275

The recast Energy Performance of Buildings Directive (EPBD) 2024/1275, adopted as part of the EU's "Fit for 55" climate package, which introduces a transformative shift in building standards across Europe. Central to the Directive is the requirement that all new public buildings must be zero-emissions by 2028, with all other new buildings (residential and non-

residential) meeting zero-emissions standards by 2030. A zero-emission building is defined as one with very low energy demand, no onsite carbon emissions from fossil fuels, and minimal operational greenhouse gas emissions.

For projects like the Proposed Development, needs to align with the Directive's zero-emissions targets, including energy performance, fossil fuel phase-out, and renewable integration. Planning authorities will expect developers to demonstrate compliance with these evolving standards, particularly as Ireland transposes the Directive into nation law by May 2026. This includes assessing lifecycle carbon emissions, incorporating energy performance certificates (EPCs), and ensuring readiness for future renovation and decarbonisation.

### 3.2.3 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 and its application to the Proposed Development is detailed in Chapter 9 (Climate) of this EIAR.

### 3.2.4 Ireland's 4th National Biodiversity Action Plan 2023-2030

Ireland's 4th National Biodiversity Action Plan (NBAP) sets the national biodiversity agenda for the period 2023-2030 and aims to deliver the transformative changes required to the ways in which we value and protect nature. The Plan was developed through extensive public consultation and expert input, adopts a "whole of government, whole of society" approach, aiming to embed biodiversity considerations across all sectors, including planning and development.

It is structured around five strategic objectives:

1. Adopting a whole of government approach
2. Meeting urgent conservation and restoration needs
3. Securing nature's contribution to people
4. Enhancing the evidence base for biodiversity action, and
5. Strengthening Ireland's international contribution.

Under the Wildlife (Amendment) Act 2023, planning authorities are now legally obliged to have regard to the NBAP's objectives and targets in their decision-making processes.

For large-scale apartment developments, such as the Proposed Development, and particularly in urban area like Galway City, the NBAP has direct implications for EIARs. The NBAP encourages integration of nature-based solutions and restoration measures into urban design. It also supports the use of Biodiversity data and monitoring to inform planning decisions.

Chapter 5 (Biodiversity) discusses the effects of the Proposed Development and how it complies with the NBAP.

## 3.3 National Planning Framework (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.

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;
- Sustainable Mobility;
- A Strong Economy, supported by Enterprise, Innovation and Skills;
- High-Quality International Connectivity;
- Enhanced Amenities and Heritage;
- Transition to a Low Carbon and Climate Resilient Society;
- Sustainable Management of Water, Waste and other Environmental Resources; and
- Access to Quality Childcare, Education and Health Services

A first revision of The NPF was published in April 2025 to take account of changes that have occurred since it was published in 2018 and to build on framework that is in place.

In the period between 2022 and 2040, it is expected that there will be roughly an extra one million people living in Ireland.

***National Policy Objective 3***

*Northern and Western Region: 150,000 additional people between 2022 and 2040 (2. 210,000 additional people over 2016-2040) i.e. a population of just over 1 million;*

***National Policy Objective 4***

*A target of half (50%) of future population and employment growth will be focused in the existing five cities and their suburbs.*

***National Policy Objective 7***

*Deliver at least 40% of all new homes nationally, within the built-up footprint of existing settlements and ensure compact and sequential patterns of growth.*

***National Policy Objective 8***

*Deliver at least half (50%) of all new homes that are targeted in the five cities and suburbs of Dublin, Cork, Limerick, Galway and Waterford, within their existing built-up footprints and ensure compact and sequential patterns of growth.*

***National Policy Objective 12***

*Ensure the creation of attractive, liveable, well designed, high quality urban places that are home to diverse and integrated communities that enjoy a high quality of life and well-being.*

***National Policy Objective 14***

*Regenerate and rejuvenate cities, towns and villages of all types and scale as environmental assets, that can accommodate changing roles and functions, increased residential population and employment activity and enhanced levels of amenity and design quality, in order to sustainably influence and support their surrounding area.*

***National Policy Objective 15***

*Apply a tailored approach to urban development, that will be linked to the Rural and Urban Regeneration and Development Fund, with a particular focus on:*

- *Dublin;*
- *the four Cities of Cork, Limerick, Galway and Waterford;*
- *Strengthening Ireland's overall urban structure, particularly in the Northern and Western and Midland Regions, to include the regional centres of Sligo and Letterkenny in the North-West, Athlone in the Midlands and cross-border networks focused on the Letterkenny-Derry North-West Gateway Initiative and Drogheda-Dundalk-Newry on the Dublin-Belfast corridor;*
- *Encouraging population growth in strong employment and service centres of all sizes, supported by employment growth;*
- *Reversing the stagnation or decline of many smaller urban centres, by identifying and establishing new roles and functions and enhancement of local infrastructure and amenities;*
- *Addressing the legacy of rapid unplanned growth, by facilitating amenities and services catch-up, jobs and/or improved sustainable transport links to the cities, together with a slower rate of population growth in recently expanded commuter settlements of all sizes; and*
- *In more self-contained settlements of all sizes, supporting a continuation of balanced population and employment growth.*

***National Policy Objective 37***

*Ensure the integration of safe and convenient alternatives to the car into the design of our communities, by prioritising walking and cycling accessibility to both existing and proposed developments, and integrating physical activity facilities for all ages.*

***National Policy Objective 41***

*Prioritise the alignment of targeted and planned population and employment growth with investment in:-*

- *A childcare/ECCE planning function, for monitoring, analysis and forecasting of investment needs, including identification of regional priorities;*
- *The provision of childcare facilities and new and refurbished schools on well-located sites within or close to existing built-up areas, that meet the diverse needs of local populations;*
- *The expansion and consolidation of Higher Education facilities, particularly where this will contribute to wider regional development; and*
- *Programmes for life-long learning, especially in areas of higher education and further education and training where skills gaps are identified.*

***National Policy Objective 42***

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

## 3.4 Regional Spatial and Economic Strategy

The Regional Spatial and Economic Strategy (RSES) for the Northern and Western Region was adopted in 2020. The Strategy is intended to:

- *Nurture all our places to realise their full potential;*
- *Protect and enhance our environment;*
- *Successfully combat climate change;*
- *Achieve economic prosperity and improved quality of life for all our citizens;*
- *Accommodate expanded growth and development in suitable locations; and*
- *Make the Southern Region one of Europe's most creative, innovative, greenest and liveable regions.*

The Northern and Western Regional Assembly (NWRA) outlines population projections within the Regional Spatial and Economic Strategy (2019-2031) for the western and northern part of Ireland, which includes the site in the Galway Metropolitan Area Strategic Plan(MASP), anticipates growth of 27,500 people by 2026 and by a further 14,500 to 2031. It further outlines that "*the Assembly supports the proposition that 50% of new homes for the population targets will be constructed within the existing city development envelope, 40% of these shall be located on infill and/or brownfield sites"* (NWRA, 2019).

Galway City is included as the primary centre identified for growth in the region through its designation as a Metropolitan Area within the NPF.

### 3.4.1 Galway Metropolitan Area Strategic Plan (MASP)

The NPF includes a national planning objective NPO67 to prepare a MASP for Galway through the RSES process. This MASP forms part of the RSES for the NWRA and outlines the strategic direction for compact growth, infrastructure, and sustainable development across the Galway Metropolitan Area, as required by the NPF and RSES.

The strategic aims of the MASP are:

- *Supporting development in the Metropolitan Area that will deliver housing for the projected population by 2029;*
- *Supporting the economic potential of the Metropolitan Area, including the development of the lands at the former Airport site and the employment zoned lands at Garraun;*
- *Ensuring compact growth and consolidation within the Metropolitan settlements of Baile Chláir, Bearna and Oranmore and the planned growth areas at Briarhill and Garraun;*
- *Leading a co-ordinated approach to the provision of infrastructure that facilitates compact and sustainable growth; • Aligning growth with existing and emerging public transport infrastructure and services, together with a focus of ensuring '10 minute' walkable settlements;*
- *Ensuring growth is consolidated with convenient access to established and planned employment, retail, community and amenity areas; and*
- *Promotion of regeneration as well as development of urban settlements in a manner that consolidated and enhances the identity, appeal and vitality of settlements as attractive places to live, work and invest.*

## 3.5 Design for Urban Roads and Streets (DMURS)

The Design Manual for Urban Roads and Streets was adopted in 2013 and updated in 2019. It sets out design guidance and standards for constructing new and reconfiguring existing urban roads and streets in Ireland. It also outlines practical design measures to encourage more sustainable travel patterns in urban areas. DMURS aims to end the practice of designing streets as traffic corridors, and instead focus on the needs of pedestrians, cyclists, and public transport users. The manual sets out design guidance and standards for constructing new, and reconfiguring existing, urban roads and streets in Ireland. Incorporating good planning and design practice and focus on the public realm, it also outlines practical design measures to encourage more sustainable travel patterns in urban areas.

The principal design guidance of DMURS has been considered in the design of the Proposed Development, TOBIN prepared a 'DMURS Statement of Compliance' to accompany this application. A Traffic and Transport Assessment (TTA) was completed by NRB Consulting Engineers Ltd, which considers that the Proposed Development is consistent with the principles and guidance outlined in the DMURS.

## 3.6 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.

The Proposed Development is located in Flood Zone B and C. Details on how the Proposed Development supports and complies with the Planning System and Flood Risk Management Guidelines are detailed in the Flood Risk Assessment completed by TOBIN.

## 3.7 Urban Development and Building Heights

The Urban Development and Building Heights: Guidelines for Planning Authorities (2018) (Height Guidelines) established a series of national rules in relation to building heights and new developments. The Height Guidelines were prepared to work in concert with the objectives of the NPF and other national Guidelines for the delivery of sustainable development and compact growth.

The Guidelines are intended to set a more proactive policy and regulatory framework for planning the growth and development of cities and towns upwards rather than outwards. The Guidelines note that increasing prevailing building heights has a critical role to play in addressing the delivery of more compact growth in urban areas, particularly cities and large towns by enhancing both the scale and density of development. Accordingly, the planning process must actively address how this objective will be secured.

The Height Guidelines are explicit in their consideration of prevailing heights of development, stressing that such heights should not dictate/constrain the scale of new development, but should still be respected (Thornton O'Connor, 2025).

The Proposed Development complies with the Height Guidelines 2028.

## 3.8 Planning Design Standards for Apartments

The updated Planning Design Standards for Apartments: Guidelines for Planning Authorities (Apartment Design Guidelines) were published in July 2025. The Apartment Design Guidelines set out the preferred locations for apartment development to encourage higher densities and consolidated residential development, and the development management standards to which they should be designed.

The Apartment Design Guidelines prescribe a series of Specific Planning Requirements (SPPRs) which apartment developments must comply, although with dispensations in some instances. In addition to the above SPPRs, the Apartment Design Guidelines set supplementary guidance and various minimum areas (within units – e.g. storage) and requirements (outside units e.g. communal amenity space).

The Proposed Development complies with these requirements as outlined in the Planning Report by Thornton O'Connor (2025) that accompanies this application.

## 3.9 Transport Strategy

### 3.9.1 Galway Transport Strategy

The Galway Transport Strategy (GTS), jointly developed by GCC and the National Transport Authority (NTA), provides a long-term framework for the development of an integrated and sustainable transport network across Galway City and its environs. The strategy supports a shift towards more sustainable modes of travel, including enhanced public transport, walking, and cycling infrastructure, while also addressing traffic management and road network improvements. The project has been reviewed in the context of the GTS to ensure alignment with its objectives, particularly in relation to promoting modal shift, reducing congestion, and supporting compact urban growth.

The Galway Port LRD Traffic and Transport Assessment (TTA), see Appendix 12.1, addresses how the GTS interacts with the Proposed Development.

## 3.10 Local Planning Policy

Under Section 9(1) of the Act, as amended, every planning authority is obliged to make a development plan every six years. The Galway City Development Plan 2023 – 2029 is the current statutory plan for the region, against which planning applications will be considered.

Section 10(1) of the Act, as amended, states that the purpose of a development plan is to set out an "*overall strategy for the proper planning and sustainable development*" in a particular functional area.

### 3.10.1 Galway City Development Plan 2023-2029

The Galway City Development Plan 2023-2029 (Amended 19th May 2025) sets the land use zoning objectives and uses that are permissible in principle and/or open for consideration within each land use.

The Proposed Development site is zoned as '*CC – City Centre'* with the objective *"To provide for city centre activities and particularly those, which preserve the city centre as the dominant commercial area of the city".*

A small area of the site at Lough Atalia Road is technically un-zoned due to its road/transportation use. Development proposed in this location is limited to roads and water infrastructure works. Chapter 3 Housing and Sustainable Neighbourhoods of the Galway City Development Plan 2023-2029 outlines the following policies which are relevant to the Proposed Development:

*Policy 3.1 Housing Strategy*

*1. Ensure that sufficient suitable lands are zoned to meet the extent of housing needs identified in accordance with the National Planning Framework 2040 (NPF), the Regional Spatial and Economic Strategy (RSES) and the Metropolitan Area Strategic Plan (MASP) targeted population for Galway City, supporting compact growth and regeneration including the requirement that at least 50% of all new homes be delivered within the existing built-up footprint.*

*2. Facilitate the implementation and delivery of the Housing Strategy and Housing Need and Demand Assessment (HNDA) 2023-2029 to meet the identified housing supply targets for the city and to aim for housing choice to be available to meet all needs and incomes.*

*3. Require as provided for under the Affordable Housing Act 2021 and Part V of the Planning and Development Act 2000 (as amended) that 10% of lands zoned for residential use, or for a mixture of residential and other uses, and any land which is not zoned for residential use or a mix of residential and other uses but in respect of which permission for the development of houses is granted, be reserved for the purposes of social housing. A further 10% shall be reserved for affordable housing in accordance with the aforementioned Acts and any relevant Ministerial guidance and regulations. Any subsequent amendments to the legal requirement to deliver 'Part V' housing during the lifetime of the Housing Strategy will be complied with. Delivery of 'Part V' housing shall be in accordance with relevant legislation and national, regional, and local policy.*

*4. Engage in pre-planning consultation with private sector developers to facilitate the delivery of housing in accordance with the vision for the housing sector as expressed in the national housing strategy Housing for All- a New Housing Plan for Ireland, the requirements of GCC Housing Strategy and Housing Need and Demand Assessment for Galway City.*

*5. Work in collaboration with the Land Development Agency to enhance delivery of the long term strategic needs for social, affordable and cost rental housing in the city. The delivery of social and affordable housing and cost rental housing on public lands will be prioritised.*

*6. Encourage and facilitate the delivery of housing on vacant sites through maintaining a Vacant Site Register and instituting the associated levy in accordance with the provisions of the Urban Regeneration and Housing Act 2015 (as amended).*

*7. Support a diverse range of housing types, size and tenures within the City Council's housing developments in the interests of achieving good integration and to allow for a choice of community for all persons.*

*8. Support a diverse range of housing types, size and tenures and endeavour to meet the demand for Owner Occupier housing as projected in the Housing Strategy and the Housing Need and Demand Assessment (HNDA).*

*13. Address the demand for additional social housing and housing delivery supports through a number of means including the construction of housing, direct acquisition of housing, delivery in conjunction with AHBs and the use of the RAS, HAPs, long term leasing, on a cost rental basis, through affordable housing purchase arrangements, shared equity schemes and any other appropriate housing delivery. Long term leasing as a social housing delivery option will be considered as a less favourable model and in accordance with Housing For All, will be phased out for new entrants*

*15. Encourage the provision of good quality, well regulated, affordable private rented accommodation in order to provide a real choice, stable and attractive housing option to meet the general demands for both short and long term accommodation including for those on social housing support.*

*16. Support and promote all initiatives that will supplement housing delivery in the city such as the Department of Finance Living City Initiative Scheme (2015); living over the shop type development and where appropriate change of use of vacant office space to residential use.*

*18. Support the development of sustainable communities and ensure that all new housing developments – private, public and voluntary are carried out in accordance with the DECLG guidelines Sustainable Residential Developments in Urban Areas (2009) and where applicable to apartments, Section 28 Ministerial guidelines – Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities, (2020).*

*20. Planning applications for multiple housing units will be required to include a Statement of Housing Mix detailing the proposed mix and demonstrating that it provides a sufficient range in unit sizes and types to satisfy community mix including the demographic trend of reduction in average household sizes. The needs of special groups such as older persons and persons with disabilities will be required to be considered as part of this process.*

*21. Continue to monitor and review the HNDA as appropriate in accordance with guidance on HNDA methodology issued by the Department of Housing, Local Government and Heritage.*

*22. Review the Housing Strategy two years following adoption as is required under legislation or at a sooner point should it be required in view of trends in the housing market or changes in national policy such as that which may come about following the preparation of revised national spatial policy.*

*23. Ensure the provisions of the Residential Tenancies (Amendment) Act 2019 and the Planning and Development Act 2000 (Exempted Development) (No. 2) Regulations 2019 and any other future legislation and guidelines are applied where planning permission is required to control short-term letting accommodation to prevent a negative impact on housing supply and /or an over-concentration of such uses. Notwithstanding this, where planning consent is required under legislation for short-term letting, there will be a presumption against allowing such a use in view of the status of the city defined as a rent pressure zone.*

*24. Ensure delivery of housing contributes to meeting the objectives for emission targets in line with national legislation and imminent National Climate Action Plan.*

*25. Support service providers in the provision of domestic violence refuges in the city.*

*Policy 3.7 City Centre Residential Areas*

*1. Prioritise the provision of new homes on designated Regeneration and Opportunity Sites in the city centre at appropriate scales to enable the development of new sustainable city centre communities.*

*2. Protect and enhance established city centre residential communities by discouraging encroachment from commercial development and unacceptable infill developments.*

*3. Enhance city centre residential areas through implementation of environmental improvement schemes and improvements to the public realm, including, where appropriate, home-zones and recreational facilities in conjunction with local residents.*

*4. Encourage the expansion of the city centre residential community by requiring a residential content in new development proposals.*

The Proposed Development is consistent with the Galway City Development Plan 2023-2029, including its stated policies and objectives. Further detail on this compliance is provided in the accompanying planning application and in the Planning Report and Statement of Consistency prepared by Thornton O'Connor (2025).

### 3.10.2 Galway City Climate Action Plan 2024-2029

The GCC Climate Action Plan 2024-2029 sets out how the City Council will be responsible for enhancing climate resilience, increasing energy efficiency and reducing greenhouse gas emissions across Galway City. It was developed in accordance with the Climate Action Plan and Low Carbon Development (Amendment) Act 2021, the Plan aligns with National targets to achieve a 50% reduction in emissions by 2030 and net-zero emissions by 2050.

The Plan integrates both mitigation and adaption measures, addressing key sectors such as energy, transport, land use, and the built environment. It also emphasises the importance of community engagement, sustainable mobility and green infrastructure. For developments in the area surrounding the Proposed Development, the Plan provides a guiding context to ensure that new projects contribute positively to climate goals. The Proposed Development has been designed with consideration of the objectives and policies set out in the Climate Action Plan, supporting Galway's transition to a low carbon, climate resilient future.

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

*Emissions Reduction Commitment*

*"Galway City Council is committed to achieving a 51% reduction in greenhouse gas emissions by 2030 and net-zero emissions by 2050, in line with the Climate Action and Low Carbon Development (Amendment) Act 2021."*

*Built Environment and Energy Efficiency*

*"Support for active travel and public transport infrastructure will be prioritised in new developments, with emphasis on reducing car dependency and facilitating walking, cycling, and electric vehicle use."*

*Land Use and Compact Growth*

*"Development will be guided towards compact, mixed-use, and brownfield sites to reduce sprawl and support sustainable urban form, particularly in areas such as the Docklands."*

*Climate Adaptation*

*All new developments must incorporate climate resilience measures, including flood risk mitigation, sustainable drainage systems (SuDS), and urban greening to address heat island effects."*

How the Proposed Development adheres to the GCC Climate Action Plan is discussed in Chapter 9 (Climate).

## 3.11 Summary

The Proposed Development at Galway Port has been assessed against a comprehensive suite of planning and policy frameworks at European, national, regional, and local levels. It aligns with the requirements of the EIA Directive, the Planning and Development 2000 (as amended), and the Planning and Development Regulations 2001 (as amended). Although the development falls below the mandatory thresholds for EIA, a voluntary EIAR, has been prepared in line with the precautionary principle and following pre-application consultation with GCC.

The Proposed Development supports the objectives of the NPF and the RSES, particularly in promoting compact growth, urban regeneration, and sustainable development within the Galway Metropolitan Area. The site's zoning under the Galway City Development Plan 2023-2029 as 'CC – City Centre' supports city centre activities, and the development is consistent with relevant housing and regeneration policies.

Furthermore, the project aligns with the strategic aims of the Galway MASP, including compact urban growth, infrastructure coordination, and sustainable transport integration. The site is located in Flood Zones B and C, and a Flood Risk Assessment has been prepared by TOBIN (2025) has been completed to ensure compliance with national flood risk management guidelines.

A Planning Report and Statement of Consistency for the Proposed Development, prepared by Thornton O'Connor (2025), was reviewed and details have been incorporated into this chapter to ensure consistency with the planning rationale and justification for the Proposed Development.

Overall, the Proposed Development is considered to be consistent with the proper planning and sustainable development of the area.

## 3.12 References

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

Guidelines for Planning Authorities on the Planning System and Flood Risk Management (Department of the Environment, Heritage and Local Government, 2009)

National Planning Framework (Project Ireland 2040)

Planning and Development Act 2000, as amended

Planning and Development Regulations 2001, as amended

Regional Spatial and Economic Strategy for the Northern and Western Region (NWRA, 2019)

Energy Performance of Buildings Directive (recast) 2024/1275

Housing for All – A New Housing Plan for Ireland (2021)

Climate Action and Low Carbon Development (Amendment) Act 2021

Ireland's 4th National Biodiversity Action Plan 2023-2030

Galway City Council City Development Plan 2023-2029

Planning Report and Statement of Consistency , Thornton O'Connor (2025)

LDA – Galway Port, Galway, Flood Risk Assessment, TOBIN (2025)

The Urban Development and Building Heights: Guidelines for Planning Authorities (2018)

Planning Design Standards for Apartments: Guidelines for Planning Authorities (2025)

Galway Transport Strategy, Galway City Council (2016)

Galway Port Traffic and Transport Assessment Report, NRB Consulting Engineers (2025)

Galway City Council Local Authority Climate Action Plan 2024 - 2029

# 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 has been prepared by Michelle Gaffney Senior EIA consultant with DNV, with over 4 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 reviewed by Laura Griffin, Environmental Consultant at DNV. Laura has a Master of Science (Hons) degree in Climate Change from Maynooth University and a Bachelor of Arts (Hons) degree in English and Geography from Maynooth University. Laura has 5+ years of professional experience. Laura has experience preparing Environmental Impact Assessment (EIA) Screening Reports and a EIAR chapters for developments of a similar scale and nature to the Proposed Development.

This chapter was reviewed by Gráinne Ryan, Principal EIA Consultant at DNV. Gráinne is an Environmental Consultant with over 11 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 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.

## 4.2 Study Methodology

A desk-based study was undertaken in August 2025 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 (Introduction) of this EIAR (EPA, 2022).

### 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 effect of air quality on human health will be experienced at a much smaller radius when compared to the socio-economic effect which can be experienced at a community or regional level.

When selecting an appropriate study area for the potential effects on population and human health in this chapter, the extent of the area assessed varies depending on the topic. In order to assess baseline population and human health conditions in the wider area, Electoral Divisions (EDs) have been used.

The Proposed Development is located within the existing operational area of Galway Port, along Dock Road and Lough Atalia Road. The study area comprises Eyre Square ED, in which the Proposed Development is located, together with the adjacent Lough Atalia ED. These areas have been selected to define the study area, as shown in Figure 4-1.

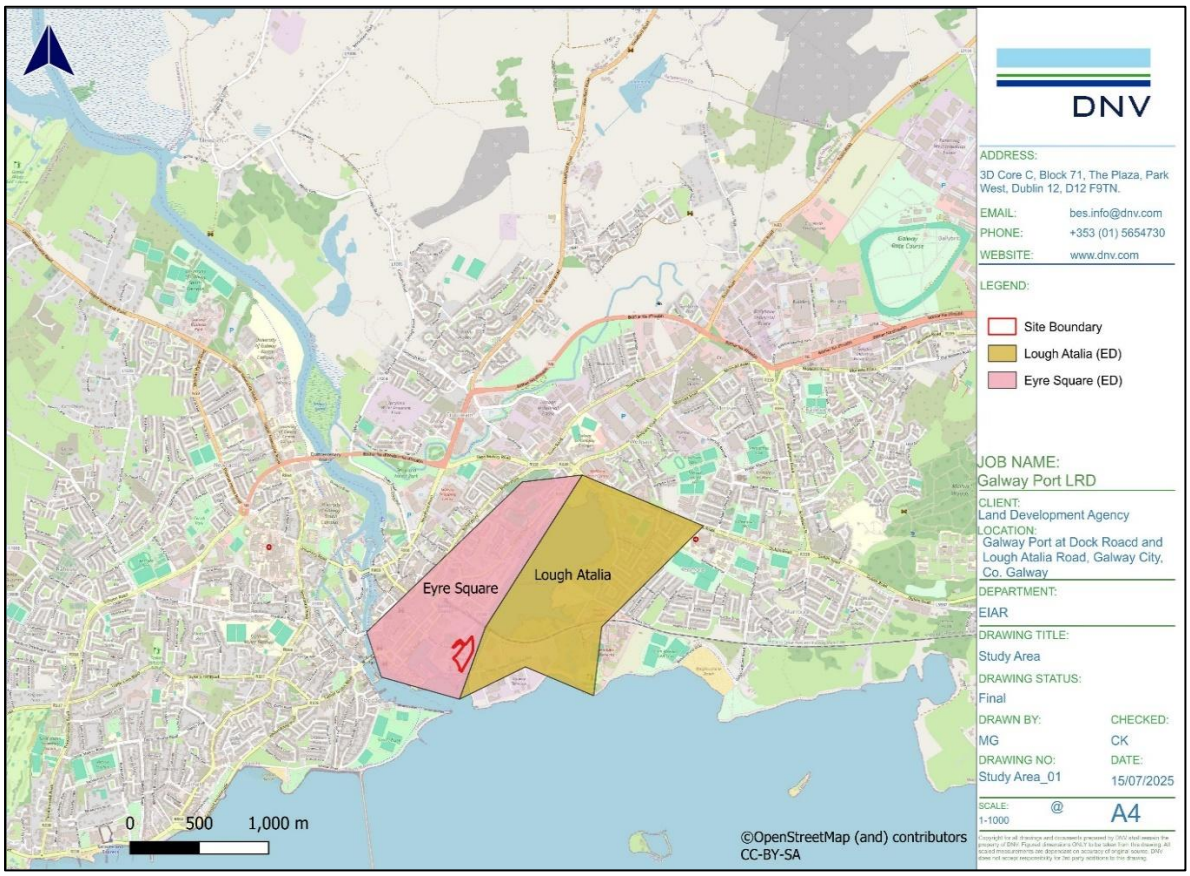



*Figure 4-1 Map of the Study Area*

### 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);
- Galway City Development Plan 2023-2029; and
- Ordinance Survey Ireland (OSI) mapping and aerial photography.

The "*Health Impact Assessment Guidance*" issued by the Institute of Public Health in Ireland (2021) outlines the link between human health and the built environment (Figure 4-2). This

document also details the negative health effects 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.

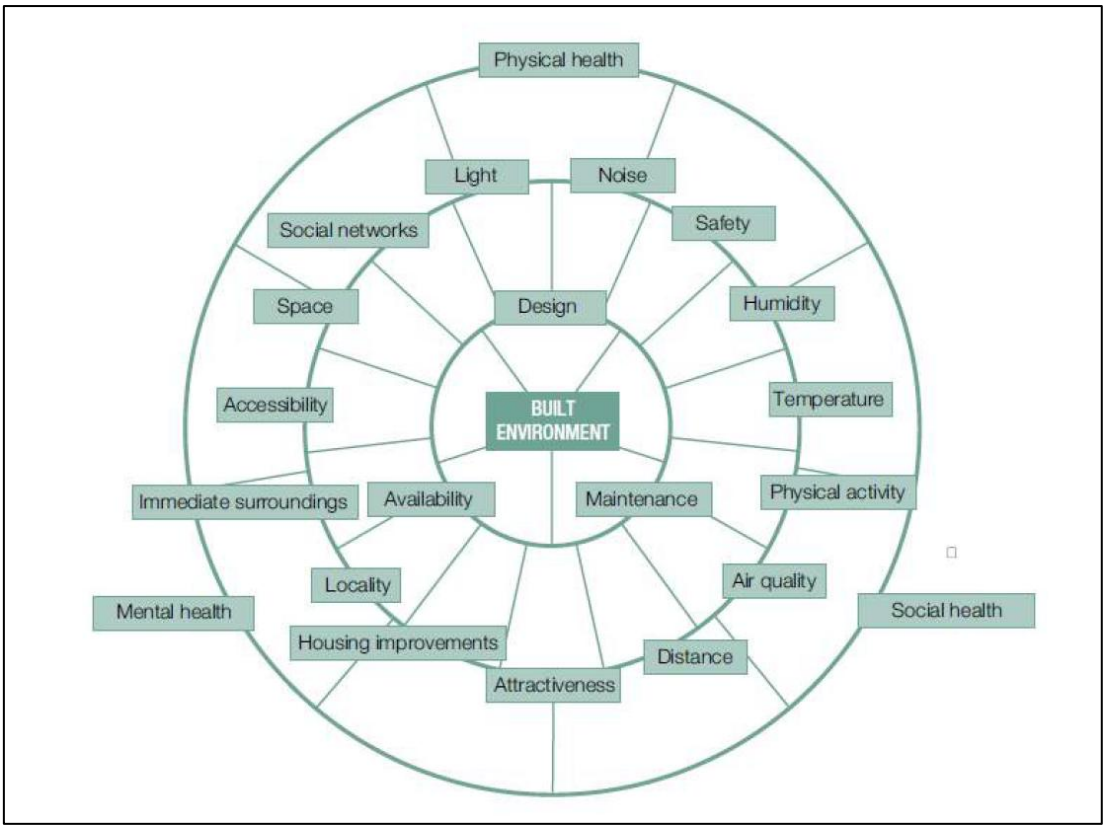



*Figure 4-2 Health Impact of the Built Environment (source: Institute of Public Health in Ireland)*

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 the 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".*

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 water quality, air quality, climate, noise and vibration, traffic and transport and landscape and visual effect.

## 4.3 The Existing and Receiving Environment (Baseline Situation)

### 4.3.1 Population and Demographic Analysis

The most recent population figures published by the CSO indicate that the combination of net inward migration and high birth rates have resulted in the population of Ireland exceeding five million for the first time since 1851. According to the Population and Labour Force Projections 2023–2057 published by the Central Statistics Office (CSO, 2024), Ireland's population is projected to reach 7.005 million, 6.446 million, or 5.734 million by 2057 under high, medium, and low net migration scenarios, respectively. These scenarios maintain consistent assumptions for fertility and mortality, with net migration being the key variable influencing the overall population outcomes. The Proposed Development falls within the Eyre Square ED and adjacent to Lough Atalia ED and within the administrative area of Galway City Council (GCC). The most recent census of population was undertaken by the CSO in 2022 and this data is used to inform this chapter.

Galway City has experienced population growth of 4.16% from 2011 to 2016 and 7.31% from 2016 to 2022 (CSO, 2022).

*Table 4-1 Population Change in Galway City from 2011 to 2022 (CSO, 2022)*

| County | Population 2011 Census Data | Population 2016 Census Data | Population 2022 Census Data |
|---|---|---|---|
| **Galway City** | 75,529 | 78,668 | 84,414 |

| | Change in Number of Persons | Percentage change in Population |
|---|---|---|
| **From 2011 to 2016** | 3,139 | +4.16% |
| **From 2016 to 2022** | 5,746 | +7.30% |

### 4.3.2 Population and Age

The social and community needs are assessed based on consideration of the existing and potential population growth and best practice provision. CSO data for 2022, recorded a total of 5,367 people living in the study area (4,456 people living in Eyre Square ED and 891 in Lough Atalia ED).

Table 4-2 shows the breakdown of population in the study area, based on their age range during the 2022 Census, against the Galway City and the State average. This table is further broken down into percentages of the population within these age ranges.

Eyre Square ED

The largest portion of the population in Eyre Square ED, is made up of young people aged 25-34 years, representing 31.40% of the population, which is higher than Galway City (32.05%) and the State (26.44%). In contrast, the percentage of children aged 0-4 years is considerably lower in Eyre Square ED (1.75%), when compared with Galway City (4.70%) and the State (5.74%). Similarly, there is a smaller proportion of adults aged 65 years and over in Eyre Square ED (8.59%), than in Galway City (12.7%) and the State (15.08%). Overall, the demographic profile of Eyre Square ED is characterised by a young population, with a strong

number of individuals in the 25-34 age cohort, and a lower representation of children, families, and older adults.

Lough Atalia ED

Lough Atalia ED also has a relatively young population, with the 5-24-year age bracket representing 17.51% of the population. However, unlike Eyre Square ED, the age distribution in Lough Atalia is more balanced across older age groups. Notably,15.6% of the population is aged 75 years and over, which is higher than Galway City (5.64%) and the State (6.51%). This suggests a more established residential profile with a higher proportion of elderly residents. The 25-34 age group, while still present, accounts for only 12.79% of the population, which is much lower than in Eyre Square ED (31.40%) and Galway City (15.88%).

*Table 4-2 Population Categories by age for the Study Area, Galway City and the State (CSO, 2022)*

| Age Range | Eyre Square ED | | Lough Atalia ED | | Galway City | | State | |
|---|---|---|---|---|---|---|---|---|
| | No. of People | % of People | No. of People | % of People | No. of People | % of People | No. of People | % of People |
| **0-4 years** | 78 | 1.75 | 38 | 4.26 | 3,970 | 4.70 | 295,415 | 5.74 |
| **5-24 years** | 1067 | 23.95 | 156 | 17.51 | 27,045 | 32.05 | 1,361,643 | 26.44 |
| **25-34 years** | 1399 | 31.40 | 114 | 12.79 | 13,412 | 15.88 | 628,031 | 12.20 |
| **35-44 years** | 733 | 16.45 | 114 | 12.79 | 12,289 | 14.56 | 794,393 | 15.43 |
| **45-54 years** | 448 | 10.05 | 117 | 13.13 | 8,831 | 10.46 | 713,507 | 13.86 |
| **55-64 years** | 348 | 7.81 | 119 | 13.36 | 8,143 | 9.65 | 579,835 | 11.26 |
| **65-74 years** | 246 | 5.52 | 94 | 10.55 | 5,961 | 7.06 | 441,028 | 8.57 |
| **75 years and over** | 137 | 3.07 | 139 | 15.60 | 4,763 | 5.64 | 335,287 | 6.51 |
| **Total** | **4,456** | | **891** | | **84,414** | | **5,149,139** | |

In summary, the age profile across the study area reflects a diverse demographic, with a strong presence of young, economically active individuals, particularly in Eyre Square ED where the 25-34 age group makes up over 31% of the population. Lough Atalia ED, by contrast, has a more balanced age structure, with a notably higher proportion of older adults, particularly those aged 75 and over, suggesting a more settled and established population.

### 4.3.3 Economic activity and employment

In Ireland, the labour force includes the number of people aged 15 years and over who are either employed or unemployed but actively seeking and available for work. Table 4-3, shows the percentage of the population who were in the labour force in the study area based on their age range during the 2022 Census, against the Galway City and State average.

Eyre Square ED

The portion of people at work in the Eyre Square ED is 61.84%, which is notably higher than the averages for Galway City (55.50%) and the State (56.09%). This elevated level of economic activity aligns with the demographic structure of Eyre Square ED, which has a high percentage of residents aged 25-34 years. This core working-age group typically reflects individuals in early to mid-career stages, including recent graduates and young working professionals. The number of people classified as students in Eyre Square ED is also notable, comprising 15.81% of the population. This figure is comparable to the Galway City average (16.02%) and is higher than the State figure (11.10%). The high proportion of students reflects the area's youthful profile and its proximity to third-level education institutions such as the University of Galway and Atlantic Technological University.

The combined proportion of people who are unemployed both short-term (2.98%) and long-term (2.66%) in Eyre Square ED is 5.64%. While this is slightly above the State average of 4.26%, it remains consistent with the Galway City average of 4.67%. The marginally higher unemployment rate may reflect the area's younger population, including students or recent graduates in transition between education and employment. The number of retired individuals is relatively low at 8.44%, which is below both the Galway City (13.29%) and the State (15.90%) averages. This corresponds with the lower proportion of people aged 65 years and over in the ED.

Lough Atalia

The proportion of people at work in Lough Atalia ED is 51.82%, lower than Galway City (55.50%), the State (56.09%), and notably less than Eyre Square ED (61.84%). This reflects a smaller working-age population compared to the younger population in Eyre Square ED.

The student population in Lough Atalia ED is 8.05%, well below both Galway City (16.02%) and Eyre Square ED (15.81%), indicating a less youthful population, likely attributed to the closer proximity of Eyre Square ED, to the University of Galway and Atlantic Technological University.

The combined unemployment rate in Lough Atalia ED is 4.03%, lower than Eyre Square's 5.64% and close to the State average (4.26%), suggesting relatively stable employment despite fewer working-age residents. Retired residents make up 27.01% of Lough Atalia's population, which is significantly higher than Galway City (13.29%) and Eyre Square ED (8.44%), indicating an older, more settled community.

*Table 4-3 Principal Economic Status in the Study Area, Galway City and the State (CSO, 2022)*

| Principle Economic Status | Eyre Square ED | | Lough Atalia ED | | Galway City | | State | |
|---|---|---|---|---|---|---|---|---|
| | No. of People | Percent | No. of People | Percent | No. of People | Percent | No. of People | Percent |
| **At work** | 2,632 | 61.84 | 399 | 51.82 | 39,618 | 55.50 | 2,320,297 | 56.09 |
| **Looking for first regular job** | 53 | 1.25 | 3 | 0.39 | 712 | 1.00 | 34,526 | 0.83 |
| **Short term unemployed** | 127 | 2.98 | 10 | 1.30 | 1447 | 2.03 | 70,217 | 1.70 |
| **Long term unemployed** | 113 | 2.66 | 21 | 2.73 | 1884 | 2.64 | 106,059 | 2.56 |
| **Student** | 673 | 15.81 | 62 | 8.05 | 11433 | 16.02 | 459,275 | 11.10 |
| **Looking after home/family** | 127 | 2.98 | 33 | 4.29 | 3327 | 4.66 | 272,318 | 6.58 |
| **Retired** | 359 | 8.44 | 208 | 27.01 | 9486 | 13.29 | 657,790 | 15.90 |
| **Unable to work due to permanent sickness or disability** | 131 | 3.08 | 32 | 4.16 | 2978 | 4.17 | 189,308 | 4.58 |
| **Other** | 41 | 0.96 | 2 | 0.26 | 497 | 0.70 | 27,062 | 0.65 |
| **Total** | **4,256** | | **770** | | **71, 382** | | **4,136,852** | |

The economic profile of the study area is generally positive, particularly within Eyre Square ED, which demonstrates high employment levels and a strong representation of students and young professionals. This reflects a dynamic, economically active population with close links to education and employment hubs in Galway City. In contrast, Lough Atalia ED has a more settled and older population, with higher rates of retirement and lower workforce participation, indicating a different socio-economic character. Despite these differences, both areas show relatively low unemployment and stable economic conditions.

The closest social welfare office to the Proposed Development with available data on the number of people on the Live Register / Unemployed is the Galway City Intreo Centre. The areas that this office provides services for are Galway City and Environs, Corrandulla, Clarenbridge, Inverin, Moycullen (areas nearer Galway), Oughterard, Roscahill, Spiddal, Turloughmore, Aran Islands, Ballinahown, Bealadangen, Carraroe, Cashla, Costello, Cuain Mhuire, Lettermore, Rosmuck, Rossaveal, Maam Cross (areas nearer Galway).

The monthly unemployment release contains a series of monthly unemployment rates and volumes. These statistics are the definitive measure of monthly unemployment. The Live Register is used to provide a monthly series of the numbers of people (with some exceptions) registering for Jobseekers Benefit or Jobseekers Allowance or for various other statutory entitlements at local offices of the Department of Social Protection. At the time of carrying out this baseline assessment, the most recent information available is from June 2025.

The number of people on the live register (Table 4-4) has remained relatively constant, with a slight increase observed in July 2025 compared to 7 months earlier, in December 2024.

*Table 4-4 Number of People on Live Register in Galway City Intreo Office (CSO, 2025)*

| Month | December 2024 | January 2025 | February 2025 | March 2025 | April 2025 | May 2025 | June 2025 | July 2025 |
|---|---|---|---|---|---|---|---|---|
| Number of Persons on Live Register | 4,135 | 4,111 | 4,177 | 4,030 | 4,072 | 4,079 | 4,296 | 4,487 |

Table 4-5 shows the industries and the people within the study area work in, compared with Galway City and the State.

Eyre Square ED

In the Eyre Square ED, the largest employment sector is classified as ‘Other’ (35.52%), which is above Galway City (22.11%) and the State (9.15%) average. This potentially reflects part-time, casual, or student-based work, consistent with the area’s youthful demographic. Professional services account for 19.95% of employment, lower than the Galway City average (26.74%) but well above the State figure (5.67%), indicating a strong presence of skilled, urban-based occupations. Commerce and trade is the third-largest sector at 18.12%, also higher than the State average (11.77%) and reflecting the ED’s central location and concentration of retail and hospitality activity.

Lough Atalia ED

Lough Atalia ED is characterised by high employment in professional services, accounting for 32.58% of the workforce, which is higher than both Eyre Square ED (19.95%) and Galway City (26.74%). Commerce and trade follow at 20.55%, slightly above the figure for Eyre Square ED (18.12%) and closely aligned with the Galway City average of 20.23%. Manufacturing is also significant, making up 16.04% of employment, which is higher than in Eyre Square (12.61%) and slightly above the Galway City average of 15.42%. The proportion of workers in the 'Other' category is 14.54%, notably lower than in Eyre Square ED (35.52%).

*Table 4-5 Industry in Which People Work in the Study Area, Galway City and the State(CSO, 2022)*

| Industry | Eyre Square ED | | Lough Atalia ED | | Galway City | | State | |
|---|---|---|---|---|---|---|---|---|
| | No. of people | Percent | No. of people | Percent | No. of people | Percent | No. of people | Percent |
| **Agriculture, forestry and fishing** | 13 | 0.49 | 0 | 0.00 | 135 | 0.34 | 82,228 | 3.54 |
| **Building and construction** | 50 | 1.90 | 10 | 2.51 | 1081 | 2.73 | 134,482 | 5.80 |
| **Manufacturing industries** | 332 | 12.61 | 64 | 16.04 | 6109 | 15.42 | 552,642 | 23.82 |
| **Commerce and trade** | 447 | 18.12 | 82 | 20.55 | 8016 | 20.23 | 273,102 | 11.77 |
| **Transport and communications** | 220 | 8.36 | 37 | 9.27 | 3480 | 8.78 | 365,716 | 15.76 |
| **Public administration** | 80 | 3.04 | 18 | 4.51 | 1445 | 3.65 | 568,105 | 24.48 |
| **Professional services** | 525 | 19.95 | 130 | 32.58 | 10594 | 26.74 | 131,639 | 5.67 |
| **Other** | 935 | 35.52 | 58 | 14.54 | 8758 | 22.11 | 212,383 | 9.15 |
| **Total** | **2,632** | | **399** | | **39,618** | | **2,320,297** | |

The economic profile of the study area is generally strong. Eyre Square ED shows high labour force participation, reflecting its younger demographic and central location. Lough Atalia ED has a more settled population, with higher levels of retirement and lower workforce participation, though overall employment remains stable. Unemployment rates across the study area are low and consistent with Galway City and the State. Employment is primarily concentrated in professional services, commerce, and trade. Eyre Square ED also shows a higher share of employment in the 'other category' which may reflect flexible or part-time roles.

Table 4-6 shows the occupation that the people in the study area work in, compared with Galway City and the State.

Eyre Square ED

In the Eyre Square ED, the most common occupation is Professional Occupations, accounting for 20.96% of the workforce. This is lower than the Galway City average (24.75%) but higher than the State average (11.71%), reflecting a skilled workforce. Associate Professional and Technical Occupations is the second highest occupation at 11.73%, which is in line with Galway City at 11.64% and notably higher than the State average at 7.35%.

Lough Atalia ED

Professional Occupations also dominate in Lough Atalia ED, with 28.37% of workers, higher than both Eyre Square ED (20.96%) and Galway City (24.75%). Associate Professional and Technical Occupations are also the second highest occupation within the ED, at 10%, which is slightly below Eyre Square (11.73%) and Galway City (11.64%) but still above the State average (7.35%).

*Table 4-6 Occupation of People in the Study Area, Galway City and the State (CSO, 2022)*

| Occupation | Eyre Square ED | | Lough Atalia ED | | Galway City | | State | |
|---|---|---|---|---|---|---|---|---|
| | No. of people | Percent | No. of people | Percent | No. of people | Percent | No. of people | Percent |
| Managers, Directors and Senior Officials | 170 | 5.92 | 24 | 5.58 | 2735 | 6.41 | 229,737 | 9.20 |
| Professional Occupations | 602 | 20.96 | 122 | 28.37 | 10628 | 24.75 | 292,273 | 11.71 |
| Associate Professional and Technical Occupations | 337 | 11.73 | 43 | 10.00 | 5000 | 11.64 | 183,584 | 7.35 |
| Administrative and Secretarial Occupations | 162 | 5.64 | 41 | 9.53 | 3124 | 7.27 | 203,532 | 8.15 |
| Skilled Trades Occupations | 161 | 5.61 | 29 | 6.74 | 2822 | 6.57 | 192,679 | 7.72 |
| Caring, Leisure and Other Service Occupations | 97 | 3.38 | 33 | 7.67 | 2379 | 5.54 | 247,044 | 9.90 |
| Sales and Customer Service Occupations | 159 | 5.54 | 34 | 7.91 | 2798 | 6.51 | 172,521 | 6.91 |
| Process, Plant and Machine Operatives | 171 | 5.95 | 32 | 7.44 | 3564 | 8.26 | 507,044 | 20.31 |
| Elementary Occupations | 238 | 8.29 | 31 | 7.21 | 3569 | 8.31 | 154,238 | 6.18 |
| Not stated | 775 | 26.98 | 41 | 9.53 | 6330 | 14.74 | 313,921 | 12.57 |
| **Total** | **2,872** | | **430** | | **42,949** | | **2,496,573** | |

Employment in the study area is concentrated in both the Professional and Associate Professional Occupations, reflecting a skilled workforce. Both Eyre Square and Lough Atalia EDs exceed State averages in these categories, aligning with Galway City's urban profile. This concentration suggests a resilient and capable study area.

In relation to education, Table 4-7 shows the highest level of education in the study area when compared with Galway city and the State.

Eyre Square ED

Eyre Square ED shows a strong educational profile, with 32.15% of residents holding an honours bachelor's degree or higher, above both Galway City (32.86%) and the State (24.5%). Only 4.01% of residents have primary education or no formation education, suggesting a well-educated population with strong potential for skilled employment.

Lough Atalia ED

Lough Atalia ED also shows a strong educational profile, with 30.4% of residents holding an honours bachelor's degree or higher. This is above the State average of 24.5%, though slightly lower than Eyre Square ED's 32.2%. The area has a somewhat higher proportion of residents with lower secondary education (10.9%) and no formal education (0.61%).

*Table 4-7 Highest Level of Education Completed in Eyre Square ED, Lough Atalia ED, Galway City and the State (CSO, 2022)*

| Highest Level of Education Completed | Eyre Square ED | | Lough Atalia ED | | Galway City | | State | |
|---|---|---|---|---|---|---|---|---|
| | No. of people | Percent | No. of people | Percent | No. of people | Percent | No. of people | Percent |
| Not stated | 816 | 25.40 | 49 | 7.44 | 6,065 | 11.35 | 220,311 | 6.51 |
| No formal education | 54 | 1.68 | 4 | 0.61 | 930 | 1.74 | 81,280 | 2.40 |
| Primary education | 75 | 2.33 | 39 | 5.92 | 2,301 | 4.31 | 251,219 | 7.42 |
| Lower secondary | 135 | 4.20 | 72 | 10.93 | 4,210 | 7.88 | 446,007 | 13.18 |
| Upper secondary | 340 | 10.58 | 129 | 19.58 | 7,828 | 14.65 | 613,478 | 18.13 |
| Technical or vocational qualification | 146 | 4.54 | 51 | 7.74 | 3,633 | 6.80 | 253,892 | 7.50 |
| Advanced certificate/Completed apprenticeship | 94 | 2.93 | 26 | 3.95 | 1,984 | 3.71 | 190,268 | 5.62 |
| Higher certificate | 140 | 4.36 | 16 | 2.43 | 2,555 | 4.78 | 187,488 | 5.54 |
| Ordinary bachelor degree or national diploma | 299 | 9.31 | 67 | 10.17 | 4,888 | 9.15 | 272,535 | 8.05 |
| Honours bachelor degree, professional qualification or both | 549 | 17.09 | 100 | 15.17 | 8,845 | 16.56 | 450,523 | 13.31 |
| Postgraduate diploma or degree | 484 | 15.06 | 98 | 14.87 | 8,710 | 16.30 | 379,416 | 11.21 |
| Doctorate (Ph.D) or higher | 81 | 2.52 | 8 | 1.21 | 1,476 | 2.76 | 38,212 | 1.13 |
| **Total** | **3,213** | | **659** | | **53,425** | | **3,384,629** | |

Education levels across the study area are generally strong. Eyre Square ED demonstrates particularly high levels of third-level qualifications, exceeding both Galway City and the State. Lough Atalia ED, while only slightly lower in third-level attainment, still performs well above the State average. The slightly higher proportions of residents with lower secondary and no formal education in Lough Atalia suggest some localised variation, but overall, the study area reflects a well-educated population.

### 4.3.4 Travel and Commuting

An assessment of commuter duration and commuter times are summarised in Table 4-8, Table 4-9 and Table 4-10. The following paragraphs detail the observations from the data outlined in these tables.

Eyre Square ED

The time period that most people leave for work school or college in Eyre Square ED is after 09:30 (15.69%), followed by 08:01- 8:30 (13.63%) and 08:31-09:00 (10.33%).

In terms of journey duration, the majority of commuters travel 45 minutes or less to work, school or college (64.23%), indicating that most people live and go to work, school or college within a 45-minute time radius.

The most utilised means of transport is by ‘on foot’, representing 32.11%, followed by car either as a driver (16.77%) or as a passenger (3.17%). This represents 19.94% of people in the Eyre Square ED that rely on private car usage. The next most utilised means of transport is bus, minibus or coach (9.49%).

Lough Atalia ED

The most common time for leaving home to attend work, school, or college in Lough Atalia ED is 08:01-08:30, accounting for 30.14% of commuters. This is followed by 07:31-08:00 (18.94%) and 08:31-09:00 (7.94%). A smaller proportion (6.31%) reported leaving after 09:30.

In terms of journey duration, 81.88% of people travel 45 minutes or less, which is notably higher than in Eyre Square ED (64.23%) and reflects shorter commuting distances. Only 1.02% reported journeys between one hour and under an hour and a half, and 1.83% travel over one and a half hours.

The most frequently used mode of transport in Lough Atalia is by car, with 34.05% of commuters driving and 12.30% travelling as passengers, indicating that 46.35% of the population relies on private vehicle transport. This is significantly higher than in Eyre Square ED (19.94%). Walking accounts for 19.79%, which is below both Eyre Square ED (32.11%) and the Galway City average (19.27%). Public transport use (bus, minibus, or coach) stands at 9.09%, while cycling accounts for 6.06%.

*Table 4-8 Time Leaving Home to Travel to Work School College or Childcare (CSO, 2022)*

| Duration of Travel Times | Eyre Square ED | | Lough Atalia ED | | Galway City | | State | |
|---|---|---|---|---|---|---|---|---|
| | No. of people | Percent | No. of people | Percent | No. of people | Percent | No. of people | Percent |
| Before 06:30 | 123 | 4.46 | 28 | 5.70 | 2,605 | 4.825 | 312,861 | 9.82 |
| 06:30 - 07:00 | 214 | 7.76 | 39 | 7.94 | 3,973 | 7.358 | 299,508 | 9.40 |
| 07:01 - 07:30 | 150 | 5.44 | 36 | 7.33 | 3,703 | 6.858 | 564,895 | 17.73 |
| 07:31 - 08:00 | 284 | 10.29 | 93 | 18.94 | 9,069 | 16.796 | 716,822 | 22.49 |
| 08:01 - 08:30 | 376 | 13.63 | 148 | 30.14 | 12,926 | 23.939 | 479,703 | 15.05 |
| 08:31 - 09:00 | 285 | 10.33 | 46 | 9.37 | 5,911 | 10.947 | 89,676 | 2.81 |
| 09:01 - 09:30 | 86 | 3.12 | 12 | 2.44 | 1,398 | 2.589 | 184,515 | 5.79 |
| After 09:30 | 433 | 15.69 | 31 | 6.31 | 6,222 | 11.523 | 212,439 | 6.67 |
| Not stated | 808 | 29.29 | 58 | 11.81 | 8,188 | 15.164 | 326,542 | 10.25 |
| **Total** | **2,759** | | **491** | | **53, 995** | | **3,186,961** | |

*Table 4-9 Journey Time to Work, School College or Childcare (CSO, 2022)*

| Journey Time | Eyre Square ED | | Lough Atalia ED | | Galway City | | State | |
|---|---|---|---|---|---|---|---|---|
| | No. of people | Percent | No. of people | Percent | No. of people | Percent | No. of people | Percent |
| Under 15 mins | 603 | 21.86 | 149 | 30.35 | 14922 | 27.64 | 936,520 | 29.39 |
| 1/4 hour - under 1/2 hour | 840 | 30.45 | 185 | 37.68 | 19471 | 36.06 | 894,844 | 28.08 |
| 1/2 hour - under 3/4 hour | 329 | 11.92 | 68 | 13.85 | 7779 | 14.41 | 550,229 | 17.27 |
| 3/4 hour - under 1 hour | 70 | 2.54 | 18 | 3.67 | 1596 | 2.96 | 186,834 | 5.86 |
| 1 hour - under 1 1/2 hours | 61 | 2.21 | 5 | 1.02 | 1288 | 2.39 | 195,397 | 6.13 |

| Journey Time | Eyre Square ED | | Lough Atalia ED | | Galway City | | State | |
|---|---|---|---|---|---|---|---|---|
| | No. of people | Percent | No. of people | Percent | No. of people | Percent | No. of people | Percent |
| 1 1/2 hours and over | 34 | 1.23 | 9 | 1.83 | 566 | 1.05 | 80,867 | 2.54 |
| Not stated | 822 | 29.79 | 57 | 11.61 | 8373 | 15.51 | 342,270 | 10.74 |
| **Total** | **2,759** | | **491** | | **53,995** | | **3,186,961** | |

*Table 4-10 Means of Travel to Work, School, College or Childcare (CSO, 2022)*

| Means of Travel | Eyre Square ED | | Lough Atalia | | Galway City | | State | |
|---|---|---|---|---|---|---|---|---|
| | No. of people | Percent | No of people | Percent | No. of people | Percent | No. of people | Percent |
| On Foot | 971 | 32.11 | 111 | 19.79 | 11,643 | 19.27 | 97,212 | 2.69 |
| Bicycle | 102 | 3.37 | 34 | 6.06 | 3,108 | 5.14 | 323,923 | 8.96 |
| Bus, minibus or coach | 287 | 9.49 | 51 | 9.09 | 5,779 | 9.57 | 1,254,419 | 34.72 |
| Train, DART or LUAS | 17 | 0.56 | - | 0.00 | 185 | 0.31 | 691,044 | 19.12 |
| Motorcycle or scooter | 4 | 0.13 | - | 0.00 | 154 | 0.25 | 9,150 | 0.25 |
| Car Driver | 507 | 16.77 | 191 | 34.05 | 17,733 | 29.35 | 266,412 | 7.37 |
| Car passenger | 96 | 3.17 | 69 | 12.30 | 9,229 | 15.28 | 456,291 | 12.63 |
| Van | 27 | 0.89 | 8 | 1.43 | 1,022 | 1.69 | 14,092 | 0.39 |
| Other (incl. lorry) | 3 | 0.10 | - | 0.00 | 98 | 0.16 | 85,316 | 2.36 |
| Work mainly at or from home | 239 | 7.90 | 49 | 8.73 | 4,437 | 7.34 | 148,823 | 4.12 |
| Not stated | 771 | 25.50 | 48 | 8.56 | 7,030 | 11.64 | 266,726 | 7.38 |
| **Total** | **3,024** | | **561** | | **60,418** | | **3,613,408** | |

Commuting patterns in the study area reveal varied travel behaviours influenced by urban location and demographics. Eyre Square ED shows a strong prevalence of active travel, with over 32% walking to work, school, or college well above Galway City and the State averages, reflecting its central location and accessibility. In contrast, Lough Atalia ED demonstrates a much higher reliance on private vehicles, with 46.35% of commuters travelling by car, significantly above Eyre Square ED (19.94%). Public transport use remains modest in both EDs. Most commuters in both areas leave home between 07:30 and 08:30, though a sizeable portion in Eyre Square ED departs after 09:30, likely due to flexible schedules or student patterns. Journey times are generally short, with over 80% of Lough Atalia commuters and 64% in Eyre Square commuting 45 minutes or less, indicating localised travel. These trends suggest a mixed transport profile for the study area, with higher car dependency in Lough Atalia ED and greater uptake of active travel in Eyre Square ED.

### 4.3.5 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.

Statistics for general health in the study area, Galway City and the State are presented in Table 4-11.

Eyre Square ED

In Eyre Square ED, 68.6% of residents reported being in very good or good health, which is lower than both the Galway City average (78.36%) and the State average (82.89%). The proportion of the population reporting fair health is 6.67%, while bad and very bad health account for 0.85% and 0.13%, respectively. Overall, the data suggests that Eyre Square ED has a slightly lower general health profile compared to Galway City and the State average.

Lough Atalia ED

In Lough Atalia ED, 77% of people reported being in very good or good health, which is close to the Galway City average and only slightly below the State figure. Fair health was reported by 11.9% of the population, with bad and very bad health reported by 1.80% and 0.56%, respectively. This suggests that Lough Atalia ED has a generally good health profile, with slightly higher rates of moderate or poor health than Galway city and the State average.

*Table 4-11 General Health Status of the Population in the Study Area, Galway City and the State (CSO, 2022)*

| General Health | Eyre Square | | Lough Atalia | | Galway City | | State | |
|---|---|---|---|---|---|---|---|---|
| | No. of people | Percent | No. of people | Percent | No. of people | Percent | No. of people | Percent |
| Very Good | 1,771 | 39.74 | 398 | 44.67 | 40,915 | 48.47 | 2,740,994 | 53.23 |
| Good | 1,286 | 28.86 | 288 | 32.32 | 25,235 | 29.89 | 1,527,027 | 29.66 |
| Fair | 297 | 6.67 | 106 | 11.90 | 7,211 | 8.54 | 444,895 | 8.64 |
| Bad | 38 | 0.85 | 16 | 1.80 | 1,211 | 1.43 | 72,556 | 1.41 |
| Very Bad | 6 | 0.13 | 5 | 0.56 | 258 | 0.31 | 16,843 | 0.33 |
| Not Stated | 1,058 | 23.74 | 78 | 8.75 | 9,584 | 11.35 | 346,824 | 6.74 |
| **Total** | **4,456** | | **891** | | **84,414** | | **5,149,139** | |

Across the study area, health is generally positive, with the majority of residents describing their health as very good or good. While both EDs fall slightly below the State average, the health outcomes are in line with urban patterns and reflect a relatively healthy population.

In terms of water quality, there are no surface water drinking water sources, under Article 7 of the Water Framework Directive, identified by the EPA (EPA, 2025), hydraulically downstream of the Proposed Development site. However, the River Corrib (IE_WE_30C020600), located approximately 1.25km upstream of the site, and the groundwater body (GWB) beneath the site, the Clarinbridge GWB (IE_WE_G_0008), are classified under Article 7 as abstraction sources for drinking water.

The River Corrib has been assigned a Q-value of 4 at the Salmon Weir Bridge monitoring station (EPA, 2025), indicating 'Good' biological water quality. Similarly, EPA groundwater monitoring data for the Clarinbridge GWB also indicates a 'Good' status (EPA, 2025). As detailed in Chapter 7 (Hydrology and Hydrogeology) of this EIAR, site-specific investigations have identified localised occurrences of organic and inorganic contaminants beneath the site and in the surrounding area, including hydrocarbons, heavy metals, and a number of PAH (polycyclic aromatic hydrocarbons) compounds, likely associated with former land use. However, the overall Clarinbridge GWB continues to be classified as 'Good' status by the EPA (2025). Further detail on these water bodies is provided in Chapter 7 (Hydrology and Hydrogeology) of this EIAR

Furthermore, the Proposed Development site is located within Galway City, which falls under Zone C of the EPA's air quality monitoring framework as detailed in Chapter 8 (Air Quality) of this EIAR. Zone C includes other cities and large towns in Ireland, where air quality is typically influenced by traffic emissions and domestic fuel combustion.

In conjunction with individual local authorities, the EPA undertakes ambient air quality monitoring at specific locations throughout the country in both urban and rural environments. An Air Quality Report based on data from fixed monitoring stations and mobile units is published annually. The most recent report, *Air Quality in Ireland 2023* (EPA, 2024), presents findings from the National Ambient Air Quality Monitoring Network and focuses primarily on particulate matter ($PM_{10}$ and $PM_{2.5}$) and nitrogen oxides ($NO_2$), the two pollutants most relevant to human health in Ireland.

Recent EPA monitoring data from nearby stations indicate that ambient air quality in the vicinity of the site is good, with pollutant concentrations well below national and EU limit values:

- $NO_2$: Galway Eyre Square station (approx. 360m from the site) recorded annual mean concentrations of 17.6 µg/m³ in 2022 and 16.9 µg/m³ in 2023, well below the EU limit of 40 µg/m³;
- $PM_{10}$: Galway Rahoon station (approx. 2.5km from the site) recorded annual mean concentrations of 12.6 µg/m³ in 2022 and 12.7 µg/m³ in 2023, below the limit of 40 µg/m³; and
- $PM_{2.5}$: Galway Briarhill station (approx. 4.5km from the site) recorded annual mean concentrations of 9.8 µg/m³ in 2022 and 7.1 µg/m³ in 2023, below the EU limit of 25 µg/m³.

All air quality data referenced in this chapter represents the most recent and publicly available information at the time of writing in 2025 (i.e. up to 2023) and are considered reliable for the purposes of this assessment.

Based on this data, the risk to human health from existing air quality conditions is considered low. Concentrations of key pollutants are well below levels associated with adverse health effects, and the EPA's Air Quality Index for Health (AQIH) consistently rates Galway City as having good air quality. It is therefore considered that existing air quality within the vicinity of the Proposed Development site does not pose a risk to human health.

#### *4.3.5.1 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 was reviewed for the study area. The site is located within the Eyre Square ED and adjacent to Lough Atalia ED. The deprivation index and relevant information for both areas are included in table 4-12 below.

*Table 4-12 Pobal HP Deprivation Indices*

| Pobal Deprivation Indices | Eyre Square ED | Lough Atalia ED |
|---|---|---|
| Pobal HP Index 2022 | 15.10 | 0.22 |
| Pobal HP Description 2022 | Affluent | Marginally Above Average |
| Population 2022 | 219 | 247 |
| Age Dependency Ratio 2022 | 11.87% | 44.13% |
| Lone Parent Ratio 2022 | 66.67% | 13.64% |
| Proportion Primary Education Only 2022 | 2.50% | 8.05% |
| Proportion at Third Level Education 2022 | 75% | 41.95% |
| Unemployment Rate – Male | 5.13 | 8.62% |
| Unemployment Rate - Female | 5.00 | 1.82% |

The Eyre Square ED in which the site is located, is considered to be 'Affluent'. The Lough Atalia ED, located adjacent to the site, is considered to have '"Marginally Above Average" deprivation levels.

### 4.3.6 Social Health

According to the WHO, 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. They are not so fixed such as type of housing and environments, access

to health or education services, incomes generated, and the type of work people do, can all influence a person's health, and the lifestyle decisions people 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 also 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.

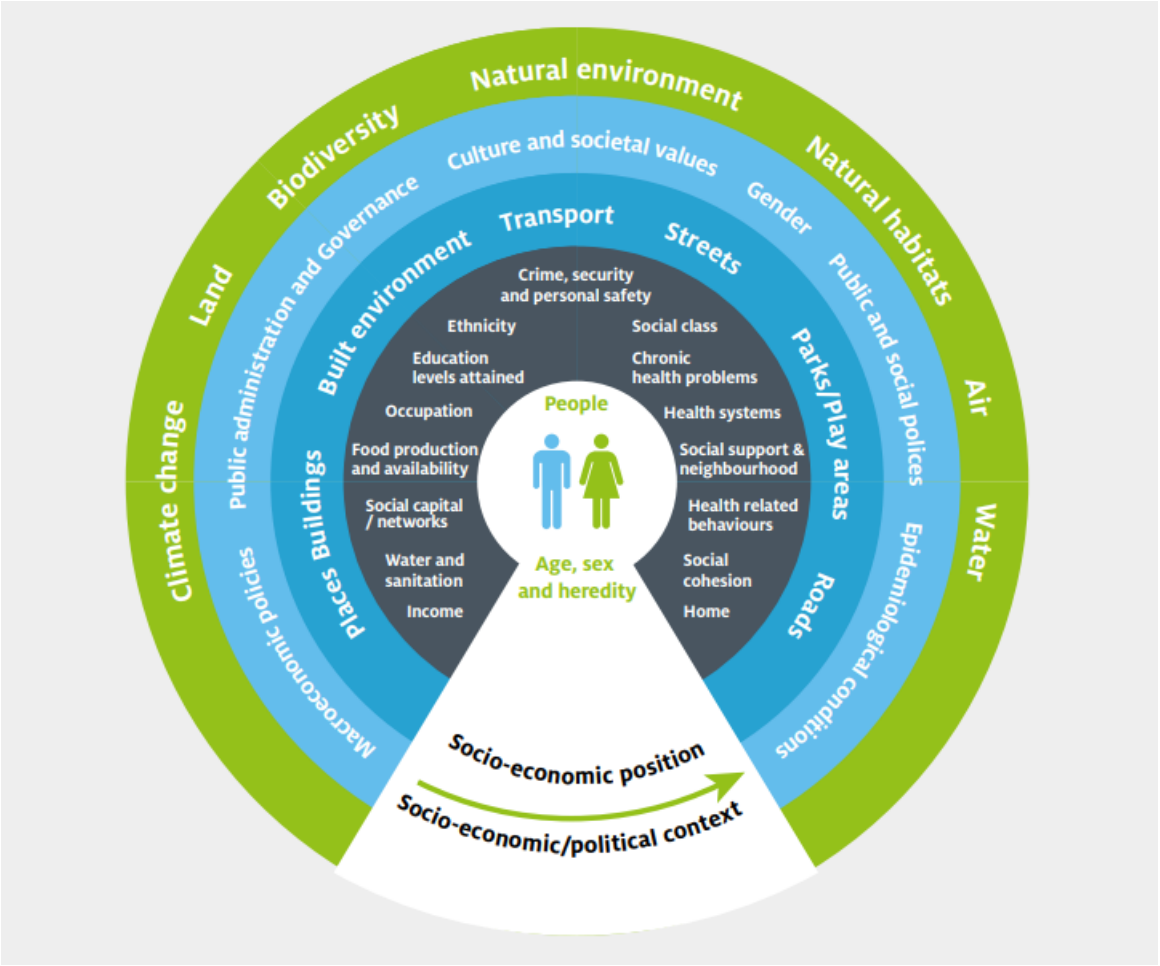



*Figure 4-3 Social Determinants of Health (Healthy Ireland, DOH 2013)*

According to the baseline assessment, the portion of people at work in the Eyre Square ED is 61.84%, and Lough Atalia ED is 51.82%. 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 study area.

As detailed in Table 4-11, the majority of people in the study area and Galway City have self-identified themselves in the 2022 Census as having 'very good health' or 'good health'. The employment levels, coupled with the self-identification of health status in both the study area and Galway City, indicate that positive social health conditions exist.

### 4.3.7 General Amenity and Tourism

The study area offers a broad range of amenities, including accessible healthcare, education, and community services, all within a short walking distance of the site. It also benefits from nearby parks, sports facilities, and recreational spaces. In addition, the study area forms part of Galway City's vibrant urban setting, which is not only well-serviced but also plays a key role in the city's tourism offering, attracting visitors with its cultural and recreational appeal.

Healthcare Facilities

The closest hospital to the site is Galway University Hospital, located 1.40km to the north-east of the Proposed Development. Galway Bay Medical Centre and Whitehall Medical Centre are located approximately 230m and 330m to the west of the site, respectively.

Education Facilities

There are a number of primary schools located in close proximity to the site. Scoil Padraic Naofa is the closest to the Proposed Development, located 0.7km to the west of the site. The closest post primary school to the site is Galway City and Oranmore Educate Together Secondary School, which is located approximately 0.7km to the west of the site. The University of Galway is located 1.50km to the north-west of the site and Atlantic Technological University is located approximately 4km to the north-east of the site.

Sports and Recreation

There are a number of sports and outdoor facilities located in the vicinity of the Proposed Development. The Galway Rowing club is located 850m to the north-west of the site. West United FC is located 470m to the south-west of the Proposed Development. Galway Hibernians Soccer club is located 1.05km to the north of the site, Galway United Football Club is located 1.55km to the north-west of the site. Additionally, Eyre Square Public Park is located approximately 550m (8-minute walking distance), to the north-west of the site with Deadman's Beach, located 670m to the south-east of the Proposed Development.

Tourism

Galway City is a vibrant and culturally rich urban centre, known for its medieval streets and lively arts scene, the city offers a wide variety of tourist attractions and experiences. Some popular tourist attractions include the Galway Cathedral, Spanish Arch, St. Nicholas' Collegiate Church, Forthill Graveyard along with cultural institutions like the Galway City Museum and numerous art galleries.

The city is also a gateway to the Wild Atlantic Way and is within reach of natural attractions including Connemara, the Aran Islands, and the Cliffs of Moher. Popular recreational amenities in Galway include Salthill Promenade, Eyre Square Park, and walks along the River Corrib.

Galway hosts several internationally renowned festivals throughout the year, including the Galway International Arts Festival, Galway Film Fleadh, and Galway Races, which draw significant numbers of domestic and international visitors.

In terms of connectivity, Galway is well served by national road and rail networks. For international access, the city is within reach of three airports:

- Ireland West Airport Knock - approximately 85 km (1 hour by car);
- Shannon Airport - approximately 90 km (1 hour by car); and
- Dublin Airport - approximately 215 km (2.5 hours by car).

Overall, the study area benefits from a high level of access to essential services, recreational amenities, and cultural attractions, reflecting its central urban location within Galway City. The Proposed Development is situated within a well-serviced urban environment that supports a high quality of life for residents and visitors alike.

### 4.3.8 Summary of the Baseline Environment

The key aspects of the baseline environment are summarised below:

- The study area presents a mixed demographic profile. Eyre Square ED has a high proportion of young, working-age residents, particularly those aged 25-34, while Lough Atalia ED has a more balanced age structure with a notably higher proportion of older adults, particularly those aged 75 and over;
- Employment levels in Eyre Square ED are higher than the Galway City and State averages, with a strong presence of students and young professionals. Lough Atalia ED has lower workforce participation and higher levels of retirement, reflecting its older population;
- Professional and associate professional occupations are the most common employment types across the study area, with both EDs exceeding State averages, highlighting a skilled and resilient workforce;
- Educational attainment is strong in both EDs. Eyre Square ED exceeds both Galway city and State averages in third-level qualifications, while Lough Atalia ED also performs above the State average, though with slightly higher levels of lower secondary and no formal education;
- Commuting patterns vary between the EDs. Eyre Square ED shows high rates of active travel, particularly walking, due to its central location. Lough Atalia ED has higher reliance on private cars. Most residents in both EDs have short commute times, typically under 45 minutes; and
- General health across the study area is positive. While both EDs report slightly lower levels of very good or good health compared to State averages, the figures remain consistent with urban centres and reflect generally favourable health outcomes.

### 4.3.9 Summary of Receptors and Sensitivity

The receptor sensitivity was determined based on the above examination of the local area and population, supported by professional judgement and informed by the Guide to Determining Significance for Human Health in Environmental Impact Assessment (Institute of Sustainability & Environmental Professionals (ISEP, formerly IEMA).

Table 4-13 provides a summary of the current sensitivity of each receptor.

*Table 4-13 Summary of Receptor Sensitivity*

| Receptor | Description | Sensitivity |
|---|---|---|
| Population demographics of the study area and local community | The baseline population demographics show that the study area has a diverse age profile, with Eyre Square ED characterised by a younger population and Lough Atalia ED showing a higher proportion of older residents. While not fully aligned with Galway city or State averages, the study area presents a broadly diverse demographic. | Medium |
| Local economy | The number of people at work in the study area is generally in line with or above the State average, particularly in Eyre Square ED, which is classified as 'Affluent', and shows high economic activity and a strong student population. Lough Atalia ED, classified as 'Marginally Above Average', exhibits lower workforce participation and a higher proportion of retired residents, reflecting a more settled population. Unemployment levels across both areas are comparable to county and State averages, indicating stable economic conditions. | Medium |
| Local population (water quality) | Safe, clean drinking water is essential for population and human health. | Medium |
| Local population (air quality) | Nuisance dust emissions from operational activities, including traffic may negatively impact air quality. | Medium |
| Local population (climate) | Changes in climate, including increased greenhouse gas (GHG) emissions, may impact public health, infrastructure, and overall quality of life. Local populations may be particularly vulnerable to climate change risks such as heat stress, respiratory conditions and flooding. | Medium |
| Local population (noise and vibration) | Noise exposure can cause a variety of human health effects including annoyance, sleep disturbance, raised stress levels, work impacts for commercial receptors or individuals who work from home. | Medium |
| Local road network | Operational vehicle movements to and from the site can affect the capacity of the local road network to support these additional journeys. | Low |
| Local population (visual effect) | The Study Area's visual landscape is characterised by a blend of residential, commercial and natural features, which collectively enhances the area's aesthetic appeal and quality of life. | Medium |

| Receptor | Description | Sensitivity |
|---|---|---|
| Local amenities | Amenities including tourism sites and community infrastructure contribute to a sense of community and the social health of the surrounding population. | Medium |

## 4.4 Characteristics of the Proposed Development

A comprehensive description of the Proposed Development is presented in Chapter 2 (Description of the Proposed Development) of this EIAR.

## 4.5 Potential Effects 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.

### 4.5.1 Construction Phase

#### *4.5.1.1 Population Demographics*

The construction phase will create short term construction related employment and on average, there will be an estimated total of between 100-150 employees on site during construction over a period of approximately 27 months. Due to the fact that employees may either be already resident in the local area or may travel to and from the site from surrounding towns, the effect on population demographics has been assessed at both a local scale and county level. The sensitivity of the receptor has been identified as medium. The magnitude of the impact is low.

Based on the mobile nature of construction and the baseline population assessment, the likely effect on population demographics as a result of the Proposed Development at a local scale will be direct, short term and slight which is overall not significant in EIA terms. At a county scale, the likely effect on population demographics as a result of the Proposed Development will be both direct and indirect, short term, and slight which is considered overall not significant in EIA terms.

#### *4.5.1.2 Socio-economic*

The construction phase will create short term construction related employment and on average, there will be a maximum of 100-150 employees during construction over a period of approximately 27 months. This is an average number of employees and in practice the number will vary across the construction period depending on the type and intensity of construction activities. Employment creation will have a direct effect on the local economy through the provision of jobs during the construction phase of the Proposed Development but also an indirect effect through increased daily spending by employees in local businesses, supporting additional employment and economic activity in the area.

Due to the fact that employees may either be already resident in the local area or may travel to and from the site from surrounding towns, the socio-economic effect has been assessed at both a local scale and a county level.

The sensitivity of the receptor in the study area has been identified as medium. The magnitude of the impact is low. Based on the mobile nature of construction and the baseline assessment of economic activity, the likely effect on the economy on a local scale will be both direct and indirect, short term positive and slight, which is considered overall not significant in EIA terms. At a county scale, the likely effect on the economy will be both direct and indirect, short term, positive and slight which is considered overall not significant in EIA terms.

#### *4.5.1.3 Human Health*

Exposure to Asbestos Containing Materials (ACMs) during construction activities is a recognised human health risk, primarily where fibres may become airborne and inhaled. Site investigations undertaken in 2019 by MKO (Appendix 6-1) identified ACMs within Made Ground located outside the Proposed Development site boundary. While ACMs were not identified in samples tested from the Made Ground within the site boundary during subsequent investigations in 2022 and 2024, the presence of asbestos in the wider area has been acknowledged. Accordingly, the potential for ACMs to occur within the site has been considered, along with the associated health risks to construction personnel during the construction phase of the Proposed Development.

These potential risks will be managed via the implementation of appropriate mitigation measures, detailed in Chapter 6 (Land and Soils) of this EIAR and in the Resource Waste Management Plan prepared by AWN (2025) submitted as part of this application under separate cover. These measures include strict adherence to health, safety and welfare provisions such as good site hygiene practices and the use of suitable personal protective equipment (PPE).

Where ACMs are encountered within excavated material, removal will only be undertaken by a suitably permitted waste contractor in compliance with the Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006–2010. All asbestos will be transported to a suitably licensed or permitted facility.

In addition, an asbestos demolition survey will be undertaken prior to the demolition of existing onsite buildings. Should asbestos be identified during demolition or excavation works, a permitted/licensed waste contractor will be engaged to remove and dispose of the material in accordance with the relevant regulations and the Best Practice Guidance for Handling Asbestos (2023).

With the implementation of the mitigation measures, the potential effect of asbestos on population and human health during the construction phase of the Proposed Development is assessed as neutral, short term and slight, and is therefore considered not significant in EIA terms.

##### **4.5.1.3.1** Mental Health and Wellbeing

During the construction phase, temporary increases in noise, dust, and traffic may have minor effects on mental health and wellbeing. The potential effects are mitigated through a range of measures, as detailed in Chapter 10 (Noise and Vibrations), Chapter 8 (Air Quality), and Chapter 12 (Material Assets-Traffic and Transport), of this EIAR. Given the implementation of

these measures, any effects on residents and construction personnel are expected to be short-term and not significant.

In addition, the construction phase is expected to generate positive socio-economic benefits through job creation, supporting wellbeing for those employed and contributing to the local economy. Overall, the effects of construction on mental health and wellbeing are assessed as negligible and short term.

#### *4.5.1.4 Hydrology - Water Quality*

During the construction phase there is potential for demolition, excavation and construction works to effect ground water and surface water quality. Surface water runoff with cementitious materials used during the construction of foundations, pavements and other structures, along with suspended solids or other potentially deleterious materials, could enter the underlying groundwater at the site. Furthermore, the existing contamination within the underlying soils and groundwater, specifically hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), and certain metals, poses a risk to construction workers if not appropriately managed.

Surface water runoff will be managed during the construction phase to ensure there will be no direct discharge to groundwater or surface water. Mitigation measures for control and management of contaminated soil and water are detailed in Chapter 7 (Hydrology and Hydrogeology) of this EIAR, to ensure the protection of construction workers. These are supported by further measures detailed in the Construction Environmental Management Plan (CEMP) prepared by DNV (2025), submitted with the planning application under separate cover, will ensure that there will be no significant effect on the receiving groundwater and surface water environment.

The effect of water quality on population and human health during the construction phase of the Proposed Development will be neutral, short term and imperceptible, which is considered overall not significant in EIA terms.

#### *4.5.1.5 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 ($PM_{10}$, $PM_{2.5}$) - 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.

There are several high-sensitivity receptors (residential dwellings and The Harbour Hotel Galway) located within 250m of the site boundary primarily to the west and south-west of the site. Appropriate mitigation and monitoring measures have been recommended in Chapter 8 (Air Quality) of this EIAR and the CEMP (DNV, 2025), submitted with the planning application under a separate cover, and will be implemented at the site in order to minimise the risk of dust emissions arising during construction and demolition. Furthermore, construction traffic is not expected to result in a significant change in Annual Average Daily Traffic (AADT) flows near to the sensitive receptors.

Therefore, the likely effect of air quality on population and human health during the construction phase will be negative, short term and slight, which is considered overall not significant in EIA terms.

#### *4.5.1.6 Climate*

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

Chapter 9 (Climate) provides a detailed assessment of GHG emissions, estimating a total of 14,423 tonnes $CO_2$eq) generated during the construction phase. The chapter also outlines the mitigation and monitoring measures proposed to minimise emissions and associated climate-related effects.

In line with LA 114 (2019) – Climate guidance, long-term climate change effects are not expected to significantly affect the construction phase. However, flood risk has been assessed as in the Flood Risk Assessment (TOBIN, 2025), submitted under a separate cover as part of this planning application. The assessment concluded that that risk of flooding to the Proposed Development will be minimal during the construction phase and the development will not increase the risk of flooding elsewhere. Mitigation measures are outlined in the Flood Risk Assessment (TOBIN, 2025). With these measures implemented, the risk of climate change effects, particularly flooding during the construction phase of the Proposed Development is considered not significant.

Overall, the likely effect on population and human health in terms of climate during the construction phase is direct, short term, negative and slight which is considered overall not significant in EIA terms.

#### *4.5.1.7 Noise and Vibration*

Noise exposure can cause a variety of human health effects including annoyance, sleep disturbance, raised stress levels, work impacts for commercial receptors or individuals who work from home. Noise generating activities associated with the construction phase have been identified in Chapter 10 (Noise and Vibration) of this EIAR and include vehicular traffic as well as noise from the operation of fixed or mobile machinery onsite.

During the construction phase all operations will comply with the BS5228:2009 "*Noise and Vibration Control on Construction and Open Sites".* The nearest noise sensitive locations

(NSLs) in relation to population and human health is The Harbour Hotel Galway, located to the south-west of the site and residential dwellings located to the to the west and south-west of the Proposed Development, as detailed in Chapter 10 (Noise and Vibration).

Noise from onsite plant and equipment has been assessed in Chapter 10 (Noise and Vibration) and it was concluded that noise mitigation measures are recommended at all stages of construction to control noise and vibration emissions during the construction phase to minimise potential effects.

Site working hours will be undertaken in accordance with the requirements of the Grant of Planning from GCC (once issued). However, it is anticipated that normal site working hours will apply to the construction phase of the Proposed Development (07:00 to 19:00 Monday to Friday (excluding bank holidays) and 07:00 to 14:00 Saturdays). No works are envisaged to be carried out on Sundays or Bank Holidays. However, should there be a need to work on Sundays, Bank Holidays or outside the specified normal working hours, a written submission, with compelling reasons for the proposed deviation, seeking authorisation will be made by the Main Contractor (once appointed) to GCC. The Main Contractor (once appointed) must give the times and dates of the proposed work, and the mitigation measures that are to be used to minimise noise/disturbance. Adherence to these defined working hours will minimise the short-term noise effects on the surrounding population.

These site controls and mitigation measures are expected to effectively manage noise and vibration emissions during the construction phase. It is therefore concluded that the likely noise and vibration effect on population and human health during the construction phase will be negative, slight and short term in nature, which is considered overall not significant in EIA terms.

#### *4.5.1.8 Traffic and Transport*

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

The construction phase will generate traffic in the form of Heavy Goods Vehicles (HGVs) and staff vehicles. Chapter 12 (Material Assets-Traffic and Transport) of this EIAR has assessed the baseline road network and confirms that the dominant construction traffic route will be via the Lough Atalia Road. Construction trip generation has been calculated in Chapter 12 (Material Assets-Traffic and Transport). The CEMP (DNV, 2025) 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.

Based on the predicted trip generation and series on traffic control measures as detailed in Chapter 12 (Material Assets-Traffic and Transport) of this EIAR, the likely effect of traffic and transport on population and human health will be direct, short term, neutral and considered overall not significant in EIA terms.

#### *4.5.1.9 Landscape and Visual Impact*

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.

However, as detailed in Chapter 2 (Description of the Proposed Development) of this EIAR, the existing site is located within the existing operational area of Galway Port, a working harbour characterised by industrial and commercial uses, hardstanding surfaces, port infrastructure, and limited vegetation. The site is currently used for storage of wind turbine parts and bus parking, with the depot building for the latter present at the site's northeastern extent. As such, the baseline landscape and visual value of the site is low, and its current contribution to local visual amenity is limited.

During the construction phase, general construction, disturbance and site development has the potential to result in significant 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 presence of open park spaces, existing buildings and the installation of hoarding around the site during construction will further reduce the visual impacts to slight , short term and negative for the construction phase.

It is therefore concluded that the Proposed Development will have a slight, short to medium-term and negative effect on the landscape character of the site and consequently on population and human health, which is considered overall not significant in EIA terms.

#### *4.5.1.10 General Amenity and Tourism*

Temporary visual, noise and traffic effects may impact the general amenity of the area during construction. However, there are no major tourism assets or high-sensitivity receptors located on or immediately adjacent to the site. A hotel is situated approximately 250 meters from the Proposed Development, but it is not expected to experience significant effects.

In relation to heritage sites, Chapter 11 (Landscape and Visual), and Chapter 14 (Archaeology and Cultural Heritage) of this EIAR, has assessed heritage sites in greater detail.

Based on the assessments made in relation to noise and vibration, traffic and transport and air quality, there will be no significant effects on these facilities relating to general amenity and tourism.

### 4.5.2 Operational Phase

#### *4.5.2.1 Population Demographics*

The Proposed Development will provide 356 No. apartments and will cater for a wide range of people including families, older persons and young couples. The inclusion of a crèche facility will support young families and working parents, contributing to a more balanced community profile.

Overall, it is estimated the operational phase will generate approximately 20 jobs. Due to the fact that employees may either be already resident in the local area or may travel to and from the site from surrounding towns, the effect on population demographics has been assessed at both a local scale and county level. The sensitivity of the receptor has been identified as medium. The magnitude of the impact is low.

Based on the mobile nature of employees and the baseline population assessment, the likely effect on population demographics as result of the Proposed Development at a local scale will

be direct, short term and slight which is considered overall not significant in EIA terms. At a county scale, the likely effect on population demographics as a result of the Proposed Development will be both direct and indirect, short term, and slight which is considered overall not significant in EIA terms.

#### *4.5.2.2 Socio-economic*

The Proposed Development is expected to contribute positively to local socio-economic conditions. The addition of new housing will support housing demand in the study area and will help alleviate pressure on the housing market. The crèche facility will provide childcare services supporting working families and contributing to early childhood development. In addition, the provision of two café/restaurant units and a retail unit will enhance local service provision, create employment opportunities, and support economic activity within the area. It is estimated that the operational phase will generate approximately 20 no. jobs during the operational phase of the Proposed Development, having a positive impact both directly and indirectly to the local economy and employment.

In line with national policy objectives for inclusive and sustainable communities, the Proposed Development includes a minimum of 20% of residential units designated as Universal Design (UD) Homes. These units are distributed throughout the scheme and comprise a mix of 1-bed, 2-bed, and 3-bed apartments. These locations are illustrated and further detailed in the Universal Design Statement prepared by ALTU, which features as part of the Architectural Design Statement (2025), submitted with this application under a separate cover.

Each designated UD Home will be carefully planned to ensure accessibility, adaptability, and usability for people of all ages and abilities. This inclusive approach ensures that homes are futureproofed and responsive to the evolving needs of residents, promoting physical and mental wellbeing, social integration, and a high quality of life for all members of the community.

The Proposed Development also includes significant public realm improvements, including a new internal street and pedestrian network, upgrades to surrounding roads, and the provision of a new toucan pedestrian/cycle crossing. These interventions, alongside 741 No. cycle parking spaces, will promote active travel and improve access to recreational opportunities, supporting healthier, more sustainable lifestyles.

A Culture and Social Infrastructure Audit (C&SIA) was carried out by Thornton O'Connor (TOC) Town Planning (2025), which is submitted with this application under separate cover. This report established the capacity of the existing social infrastructure within a 1.5km study area surrounding the Proposed Development, to support the needs of the existing population and future residents. The following categories were utilised when assessing social infrastructure within the 1.5km radius study area:

- Education Facilities;
- Childcare;
- Social, Community and Cultural Facilities;
- Healthcare and Emergency Services;
- Open Space and Recreation
- Faith Institutions; and
- Retail Centres and Services.

The assessment concluded:

> *"There is a sufficient existing provision of community, cultural and social infrastructure in the vicinity of the subject site (i.e. within a c. 1.5 km radius) to support the proposed development. Overall, healthcare, sports and recreation, community, education, and other facilities are all well represented within the area and cater for the existing and proposed new residential community'.*

The C&SIA also concluded that there is a "*wide range of existing social and community infrastructure to support the development and this is an ideal location for the proposed residential development'*

It is therefore concluded the overall effect of the Proposed Development on socio-economic health will be slight, positive and long term, which is considered overall not significant in EIA terms.

#### *4.5.2.3 Human Health*

During the operational phase, potential risks to future occupants from asbestos, lead, and PAHs can be effectively mitigated through the use of barrier layers in areas where contaminated soils are to remain in situ as detailed in Chapter 6 (Land and Soils) of this EIAR. These barrier layers will comprise either the permanent development footprint (e.g. buildings, tarmac, or concrete hardstanding) or engineered capping layers within communal landscaped areas.

With the implementation of these measures, the potential effect on human health during the operational phase of the Proposed Development is assessed as neutral, long term and slight, which is therefore considered not significant in EIA terms.

**4.5.2.3.1** Mental Health and Wellbeing

The operational phase of the Proposed Development is expected to support mental and physical health and wellbeing, by improving access to housing and childcare, as well as providing communal open spaces and enhanced active travel routes, including improved pedestrian permeability and cycling facilities. These features encourage physical activity, facilitate social interaction, and foster connectivity within the community, providing direct, long-term benefits to residents' wellbeing. It is considered that the Proposed Development will result in a positive, long-term effect on mental health and wellbeing, which is considered not significant in EIA terms.

#### *4.5.2.4 Hydrology -Water Quality*

There will be no direct discharges to groundwater or surface water from the Proposed Development site. As outlined in Chapter 7 (Hydrology and Hydrogeology), with the implementation of appropriate mitigation measures, no significant sources of contamination are anticipated during the operational phase. The design for the proposed Development will include the use of barrier pipes for water supply in certain areas of the site to prevent potential permeation of contaminants into drinking water supplies. As such, no significant adverse effects on human health are expected. Based on the proposed mitigation measures, the likely effect of water quality on population and human health is considered to be direct, long-term, neutral, which is considered overall not significant in EIA terms.

#### *4.5.2.5 Air Quality*

During the operational phase, the Proposed Development may lead to minor changes in local air quality due to potential traffic activities associated with the Proposed Development. Chapter 8 (Air Quality) of this EIAR indicates that there will be an imperceptible effect on air quality in the vicinity of the site due to associated traffic flows of the Proposed Development. Existing residents and future tourists in the area will not experience significant air quality effects. Furthermore, sustainable modes of transport are encouraged through the pedestrian and cycle links to the surrounding area and the provision of bicycle parking.

Therefore, the overall effect of the Proposed Development on air quality and subsequently human health will be direct, neutral, imperceptible and long-term, which is considered overall not significant in EIA terms.

#### *4.5.2.6 Climate*

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 effects 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 effect will be long-term, localised, neutral and imperceptible.

During the operational phase of the Proposed Development, there is potential for the release of a number of GHG emissions to the atmosphere with the main emission sources arising from heating, domestic hot water, and lighting. However, the Proposed Development has been designed to reduce the effect to climate where possible. A number of measures have been incorporated into the design to ensure the operational phase emissions are minimised, as summarised in Chapter 9 (Climate).

It is therefore considered that no significant effects on climate change will arise during the operational phase of the Proposed Development. As a result, the effect on Population and Human Health is assessed as direct, long-term, negative, and slight which is considered overall, not significant in EIA terms.

#### *4.5.2.7 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 The Harbour Hotel Galway and have been listed in Chapter 10 (Noise and Vibration) of this EIAR. The main potential source of operational noise from the development is plant and equipment, traffic movements, car parking, creche play area and external public amenity spaces. Chapter 10 (Noise and Vibration) concluded that there will be no significant noise effects on the surround NSLs during the operational phase. Furthermore, there are no predicted vibration sources during the operational phase. Mitigation and monitoring measures will be incorporated to further reduce the potential for noise generation from the Proposed Development during the operational phase.

Based on the above assessment the likely effect of the Proposed Development on noise and vibration and subsequently human health will be direct, long term, negative and imperceptible, which is considered overall not significant in EIA terms.

#### *4.5.2.8 Traffic and Transport*

The Proposed Development has the potential to cause additional traffic, air emissions from increased traffic, this has the potential to cause congestion, thus impacting the human health of road users.

A full assessment of traffic and transport effects are presented in Chapter 12 (Material Assets-Traffic and Transport) of this EIAR. Chapter 12 has assessed the potential effects of the Proposed Development on the local road network. A detailed traffic assessment was undertaken by NRB Consulting Engineers Ltd using the industry-standard TRICS (Trip Rate Information Computer System) database to estimate the potential traffic generation associated with the Proposed Development as detailed in Chapter 12 (Material Assets-Traffic and Transport) of this EIAR. The TRICS analysis, based on a worst-case scenario assuming typical level of residential car parking, indicated that the Proposed Development would generate a low volume of vehicular trips during peak hours (approximately 91 Passenger Car Units (PCUs) two-way). However, due to the significantly reduced car parking provision (37 spaces for 356 units), the actual traffic generation is expected to be substantially lower.

As a result, the Proposed Development is not expected to give rise to any significant traffic-related effects on human health, such as increased air pollution, noise, or road safety risks.

Activity to the existing site is served by an extensive network of footpaths connecting the site to the local area and providing direct links to the high-quality public transport services locally and within the wider area. Eyre square is located approximately 550m (8-minute walking distance) to the north-west of the site and is served by 10 No. intracity bus routes. Furthermore, 10. No. Bus Eireann routes serve the nearby Galway bus station located 310 meters to the north of the Proposed Development site. Details of these bus routes are outlined in the Planning Report and Statement of Consistency (TOC, 2025), submitted with the planning application under a separate cover. There are also several proposed new bus routes for Eyre square, within the Busconnects scheme, which will enhance the connectivity of the Proposed Development with surrounding areas such as Kocknacarra, Oranmore and Castlegar and offer transport links to other suburbs and employment facilities in Galway.

The Proposed Development site is also located approximately 550 meters from Galway (Ceannt) Train station, which provides frequent and easy access to Dublin City, Limerick and Waterford. In terms of road infrastructure, to the west of the site, Dock Road connects to the city centre, providing easy access westwards towards Eyre Square and the main commercial areas of Galway City. To the north, Lough Atalia Road links to the N6, which offers routes east towards the M6 motorway, facilitating travel to Dublin and the national motorway network. Furthermore, the Proposed Development will promote and encourage sustainable modes of transport through various pedestrian and cycle links to the surrounding area and the provision of bicycle parking. The Proposed Development also includes reduced level of car parking provision, reflecting its highly accessible and central location as detailed in Chapter 12 (Material Assets-Traffic and Transport). This approach aligns with national planning guidance and promotes a shift towards more sustainable travel behaviour. Provision has also been made for car share spaces, and one set down space further supporting low car dependency and encouraging the use of alternative, more sustainable modes of transport.

The urban location of the Proposed Development Site, combined with the low traffic generation, supported by high quality walking and cycling facilities and its proximity to a wide

range of services and employment locations, will ultimately promote sustainable modes of transport and result in a neutral, long-term and slight effect on population and human health, which is considered overall not significant in EIA terms.

#### *4.5.2.9 Landscape and Visual Impact*

The potential landscape and visual effects of the Proposed Development are fully assessed in Chapter 11(Landscape and Visual Assessment) of this EIAR. The Proposed Development has the potential to cause visual effect during the Operational Phase. The site is currently an area of reclaimed land east of Lough Atalia Road, in what was previously the marshy channel between Galway Bay and Lough Atalia. The brownfield site is currently used for storage of wind turbine parts and bus parking, with the depot building for the latter present at the site's northeastern extent.

Significant changes will occur to the landscape of the site, primarily due to demolition of the existing buildings and construction of the Proposed Development comprising 4 no. mixed use buildings ranging in height from 6–13 storeys. However, these changes will be counterbalanced by the inclusion of extensive landscaping measures including numerous trees, hedges and ornamental planting.

Furthermore, the Proposed Development will transform the former industrial strip beside the Lough Atalia channel into a high-density residential neighbourhood, with generous provision of public open space (the Lough Atalia Walk and open space) and buildings of design and material quality.

The effect of the Proposed Development on landscape in relation to human health will be negligible, neutral, and long term for the operational phase, which is considered overall not significant in EIA terms.

#### *4.5.2.10 General Amenity and Tourism*

The site is located in close proximity to a range of healthcare, education, and recreational facilities. The availability of these services within walking or cycling distance is expected to support the integration of the new residents into the existing community and enhancements the overall amenity value of the area. The provision of public open space and pedestrian/cyclist connections within the Proposed Development will further contribute to local amenity, encouraging active lifestyles and social interaction among residents.

The local amenities and tourism sites referenced in Section 4.3 will remain in place during the Operational Phase of the Proposed Development. Furthermore, the potential viability of these amenities and tourist sites going forward will be strengthened from the increased population of the area. It is considered that the Proposed Development will result in a negligible, not significant, positive and long-term effect in terms of general amenity and tourism. As such, this effect is assessed as not significant in EIA terms in relation to population and human health.

### 4.5.3 Potential Cumulative Effects

The list of cumulative schemes has been detailed in Chapter 2 (Description of the Proposed Development) of this EIAR. Cumulative effects are summarised in Table 4-14.

*Table 4-14 Summary of Cumulative Effects*

| Topic | Description |
|---|---|
| Population demographics | The cumulative schemes along with the Proposed Development will result in an increase in the number of people in the surrounding area through construction and operational employees, future residents and service users (creche, retail and café). The Proposed Development will comprise 356 No. units, of which it is assumed that all units can reasonably accommodate families with children (with 1-bedroom units being included in this instance). The average household size in the Study Area recorded by the 2022 Census was 2.38 No. persons per household, which generates a total indicative population of 848 No. persons when applied to the proposed development The cumulative effects on population demographics will be neutral, moderate and long term. |
| Socio-economic | The Proposed Development in combination with existing and approved developments will continue to support the local economy both directly and indirectly through job creation and continued support of existing businesses. The cumulative effects on the socio-economic status of the surrounding area will be both direct and indirect, short to long term and positive. |
| Water quality, air quality, climate, noise and vibrations traffic and transport, landscape and visual Impact | Cumulative effects relating to water quality, air quality and climate, noise and vibrations, traffic and transport landscape and visual Impact, have been assessed in their respective chapters. It is expected that the control and mitigation measures implemented through the Proposed Development combined with those associated with the cumulative schemes will ensure there are no long term, negative, significant effects on population and human health. |

### 4.5.4 "Do Nothing" Effect

If the Proposed Development did not proceed, the site would remain as a brownfield storage site for wind turbines and bus parking, and there would be no immediate effect on the existing population or economic activity in the area. This would be an under-utilisation of zoned and serviceable urban lands to deliver significant, much needed housing, from a sustainable planning and development perspective.

## 4.6 Avoidance, Remedial and Mitigation Measures

### 4.6.1 Construction Phase

No specific mitigation measures are required during the construction phase in relation to population and human health, given the lack of direct, adverse effects resulting from the Proposed Development. The potential effects on the human environment relate to other environmental aspects such as Land and soils, water quality, air emissions, climate, noise and vibrations, traffic, and landscape and visual and where required, the related mitigation measures are dealt with in the corresponding chapters of 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, adverse effects resulting from the Proposed Development. The potential effects on the human environment relate to other environmental aspects such as Land and soils, water quality, air emissions, climate, noise and vibrations, traffic, and landscape and visual and where required, the related mitigation measures are dealt with in the corresponding chapters of this EIAR.

### 4.6.3 "Worst Case" Scenario

In the event that mitigation measures fail to minimise and / or prevent potential adverse effects, the following possibilities may occur:

- Contamination of water on the site;
- Release of asbestos fibres from ACMs, should they be present and disturbed during construction works;
- An increase of traffic within the surrounding roads and junctions of the site;
- An increase in noise caused during the construction phase can cause a disturbance any residential dwellings in close proximity to the site; and
- An increase in the production of dust that can be carried throughout the site and create adverse effects on the neighbouring environment.

However, 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 Effects

Residual effects are defined as '*The degree of environmental change that will occur after the proposed mitigation measures have taken effect.' (EPA, 2022).*

No negative residual effects in the context of population and human health are anticipated regarding this Proposed Development. This conclusion is based on the findings of the specialist assessments presented throughout this EIAR, including Hydrology and Hydrogeology, Land and Soils, Air Quality, Climate, Noise and Vibration, Traffic, and Landscape and Visual Impact. Where potential effects were identified, mitigation measures have been proposed and incorporated into the design and construction methodology. With these measures in place, no significant residual effects are expected to arise that would adversely affect human health or wellbeing.

It is considered that the Proposed Development will have a positive residual effect on population and socioeconomic aspects securing future employment and contributing positively to economic activity for residents living in the area.

## 4.8 Monitoring

No specific monitoring is proposed in relation to population and human health during the construction or operational phase. However, where required, monitoring in relation water quality, land and soils, air quality, climate, noise and vibration, traffic and transport and landscape and visual impact are identified in their respective Chapters in this EIAR.

## 4.9 Interactions

There are numerous inter-related environmental topics described in detail throughout this EIAR which are of relevance to population and human health.

### 4.9.1 Biodiversity

There is an interaction with biodiversity in relation to lighting within public open spaces. While lighting is necessary to ensure a safe and accessible environment for residents and the public, it has the potential to impact nocturnal species such as bats, otters, and seals. Mitigation measures, as outlined in Chapter 5 (Biodiversity), have been incorporated into the design to minimise these effects.

### 4.9.2 Land and Soils

During the construction phase, potential risks to construction workers may arise from exposure to ACMs and other soil contaminants (e.g. lead, PAHs, hydrocarbons). These risks will be effectively managed through the implementation of standard health and safety procedures, use of personal protective equipment (PPE), good site hygiene, and compliance with relevant asbestos and contaminated land regulations. Licensed contractors will undertake the removal and disposal of any asbestos or contaminated materials in accordance with statutory requirements.

During the operational phase, potential risks to future occupants from residual soil contamination (e.g. asbestos, lead and PAHs) will be mitigated by the incorporation of permanent barrier layers. These will include building footprints, hardstanding, and engineered capping layers in landscaped areas. This design approach ensures that no exposure pathways remain between future occupants and contaminated soils.

With the implementation of these measures, the potential effects of contaminated soils and asbestos on population and human health during both the construction and operational phases of the Proposed Development are assessed as neutral, short to long term and slight, and are therefore considered not significant in EIA terms.

### 4.9.3 Hydrology

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. No public health issues associated with the water conditions at the site have been identified for the construction phase or operational phase of the Proposed Development. There are no likely significant adverse effects as a result of water quality (Hydrology) and as such there will be no significant effects on population and human health.

### 4.9.4 Air Quality

The Proposed Development has the potential to generate dust during construction and emissions from traffic during both construction and operation, which could affect nearby sensitive receptors if not properly managed However, as outlined in Chapter 8 (Air Quality), no significant air quality effects are anticipated. All relevant ambient air quality legislative limits will be met, and appropriate mitigation measures will be implemented. As a result, the

predicted effect on air quality is not significant, with a neutral effect on population and human health.

### 4.9.5 Climate

Interactions between climate and human health have been considered with regard to GHG emissions and the potential long-term effects of climate change. As assessed in Chapter 9 (Climate), emissions associated with the Proposed Development are not significant, and the development has been designed to incorporate energy-efficient measures and climate resilience features, including appropriate drainage infrastructure. Flood risk has also been assessed and is considered not significant. As such, the overall effect on climate, and any indirect effects on population and human health, is considered to be neutral and not significant.

### 4.9.6 Noise and Vibration

Construction activities such as site clearance, building construction works, and trucks and vehicles entering and exiting the site have the potential to interact with the surrounding population and human health and cause noise disturbance. The impact assessment of noise and vibration has concluded that additional noise associated with the construction phase will not cause a significant adverse effect, with the implementation of proposed mitigation measures.

Operational phase noise effects have also been assessed in relation to traffic and plant equipment and no significant adverse effects will be experienced. As such, there will be no significant effect on population and human health.

### 4.9.7 Landscape and Visual

The Proposed Development will alter the visual appearance of the site which is predominantly a brownfield site including the existing buildings to be demolished. It is not considered that the Proposed Development by virtue of its visual appearance and in the context of the proposed zoning of the site of the Proposed Development and the suburban nature of the surrounding landscape, will cause any significant effects and as such there will be no significant effect on population and human health.

### 4.9.8 Material Assets-Traffic and Transport

Construction and operational activities will result in an increased number of traffic movements. There is a potential effect on population and human health in relation to the capacity and operation of the surrounding road network. The overall effect of the Proposed Development on the transportation infrastructure in the local area will not be significant and subsequently there will be no significant effect on population and human health.

### 4.9.9 Material Assets-Waste and Utilities

Improper removal, handling, or storage of hazardous or domestic waste, as well as extended disruption to electricity, telecommunications, water supply, or sewerage systems, could adversely affect Population and human health. However, as detailed in Chapter 13 of this EIAR, appropriate mitigation measures will be implemented. As a result, the predicted effect on material assets-waste and utilities is not significant, with a neutral effect on population and human health.

## 4.10 Difficulties Encountered When Compiling

Overall, there were no difficulties encountered when compiling this Chapter of the EIAR. All research was conducted through a desk top study.

## 4.11 Conclusion

The Proposed Development is expected to result in positive, long-term effects on population and human health, particularly through the provision of new housing, childcare facilities, open spaces and enhanced pedestrian and public transport permeability. During the construction phase, short-term positive effects are anticipated in relation to employment and economic activity, while temporary negative effects such as water quality, noise, dust, landscape and traffic disruption are considered, with appropriate mitigation measures outlined in the relevant chapters of this EIAR.

During the operational phase, the Proposed Development is not expected to result in significant adverse effects. Potential effects relating to water quality, air quality, climate, noise and vibrations, traffic and transport, and landscape and visual are considered not significant, and mitigation measures have been incorporated into the design and assessed in detail in the relevant chapters of the EIAR.

No residual significant negative effects on population or human health are anticipated.

## 4.12 References

ALTU 2025, Galway Port LRD Mixed Use Development Architectural Design Statement

Assessment of Health Impacts within National Environmental Regulation Process. Report commissioned by Environmental Protection Agency. Golder Associates. April 2015.

AWN Consulting, 2025 (AWN, 2025). Resource & Waste Management Plan for a Proposed Mixed-Use Development. Galway Port LRD, (RWMP).

DNV, 2025. Construction Environmental Management Plan (CEMP) (DNV, 2025). Galway Port Residential Scheme. Land Development Agency.

Environmental Protection Agency, May 2022 (EPA, 2022). Guidelines on the information to be contained in Environmental Effect Assessment Reports.

European Commission, 2017. Guidance on the preparation of the environmental impact assessment report (Directive 2011/92/EU as amended by 2014/52/EU).

Galway City Development Plan 2023–2029.

Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions. (European Communities 1999).

Healthy Ireland Framework 2013–2025.

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

ISEP 2022(Formally IEMA, 2022) Guide to Determining Significance for Human Health in Environmental Impact Assessment, Institute of Sustainability & Environmental Professionals

Ordinance Survey Ireland (OSI).

The Central Statistics Office (CSO).

Thornton O' Connor 2025, Culture and Social Infrastructure Audit.

Thornton O' Connor 2025, Planning Report and Statement of Consistency.

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

DNV was commissioned by the Land Development Agency (LDA) to prepare this Biodiversity Chapter in relation to an Environmental Impact Assessment Report (EIAR) prepared for a Large-Scale Residential Development (LRD) (hereafter referred to as the 'Proposed Development'), at Galway Port, Galway City (hereafter collectively referred to as the 'site', where appropriate).

This Biodiversity 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 report 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 report follows Guidelines for Ecological Impact Assessment in the UK and Ireland, by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2024) and supplemented by the National Roads Authority (2009) guidelines for Assessment of Ecological Impacts of National Road Schemes. This NRA guideline is considered a relevant and widely accepted reference for ecological assessment in Ireland. Although originally developed for road projects, the guidelines provide a robust framework for Ecological Impact Assessment (EcIA), including the valuation of ecological receptors, impact assessment, and mitigation planning. Their methodology aligns with best practice standards such as those set out by CIEEM and is frequently applied across various development types. Inclusion of these guidelines supports consistency, transparency, and professional rigour in the biodiversity chapter of an EIAR.

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 effects.
- 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

DNV is a multi-disciplinary consultancy specialising in the areas of the Environment, Waste Management and Planning. All surveying and reporting have been carried out by qualified and experienced ecologists and environmental consultants.

Hugh Rowlands (HR), Ecologist with DNV, undertook the partial desktop study and the preliminary walkover of the site (PEA). Brian Mc Closkey (BMcC), Ecologist with DNV, undertook the winter bird surveys and breeding scoping survey. Shane Cully (SC), Senior Ecologist, and BMcC completed the bat transect activity survey, while SC completed the

dedicated Otter survey. Ciara Barry-Hannon (CBH), Senior Ecologist with DNV authored this Biodiversity Chapter. Alice Clarke (AC), Senior Ecologist with DNV undertook the internal review, while Ben Lansbury (BL) Principal Ecologist with DNV, undertook the internal approval.

HR has a B.A. (Mod.) in Zoology and a M.Sc. in Biodiversity and Conservation from Trinity College Dublin, and a PgDip in GIS and Remote Sensing from the University of Ulster. HR has a wealth of experience in biodiversity mapping, desktop research, literature review and reporting, as well as practical field experience including habitat mapping, invasive species surveys, and ornithology surveys.

BMcC is an experienced Ornithologist with a BSc in Planning and Environmental management from the Technological University of Dublin (TUD) and 12 years of bird survey experience, including three years of professional Ornithology work. BMcC is a longstanding and active member of Bird Watch Ireland and is also the author of several articles in UK birding publication Birdwatch Magazine. BMcC is highly experienced in all survey methodologies and with surveying all species groups of Irish birds and migrants, having provided a range of ornithology survey work for ecological consultancies, e.g., vantage points surveys of gulls, terns, raptors, waders and wildfowl; hinterland surveys of the above as well as riverine species; and breeding waders and country birds.

SC has a B.Sc. (Hons) in Botany from the University of Galway and 3 years' experience as an Ecological Consultant. SC has extensive experience surveying bats, birds, mammals, plants, habitats, reptiles, amphibians, and invasive species. SC is also experienced in obtaining bat derogation licences from the NPWS and holds a bat disturbance licence (DER/BAT 2024-107). SC's experience in ecological report writing includes but is not limited to Appropriate Assessment (AA) Screenings and Natura Impact Statements (NIS), Ecological Impact Assessments (EcIA), Bat Reports, Constraints Reports, Invasive Species Management Plans (ISMP), and EIAR chapters.

CBH authored this Biodiversity Chapter and is an Ecologist with DNV. CBH has 3 years of ecological consultancy experience, with a BSc. (Hons) in Wildlife Biology from Munster Technological University (formerly ITT) and a wealth of experience in desktop research, literature review and reporting, as well as practical field and laboratory experience. CBH has prepared several Stage I and Stage II AA Reports. Additionally, CBH has supported the preparations of several Biodiversity Chapters for EIAR. CBH is also a Qualifying member of the Chartered Institute of Ecology and Environmental Management (CIEEM).

AC reviewed this Biodiversity Chapter and is an Ecologist with DNV. AC is a skilled general ecologist with six years' experience; she is an Associate member of CIEEM (ACIEEM) with an MSc in Ecological Management and Conservation Biology from Queen's University Belfast. AC has a wealth of experience authoring and reviewing Screenings for AA, NIS, EcIA and Biodiversity Chapters for EIAR. Subsequently, she is very familiar with the process of ecological assessment and the relevant legislation. She is knowledgeable in a range of survey techniques, including bats, mammals (particularly badger and otter), birds, amphibians, invasive species and habitat surveys.

BL is a Principal Ecologist with over a decade of experience in both the private and public sectors, currently working at DNV He holds an MSc in Environmental Consultancy and a BSc in Marine and Freshwater Biology and is a member of the Chartered Institute of Ecology and Environmental Management (MCIEEM). BL has led ecological input on a wide range of projects including residential developments, transport infrastructure, renewable energy, and

conservation initiatives. His expertise spans project and team management, ecological survey design, planning support, and report preparation. Notable projects include managing ecological assessments for a 500-home development in Devon, leading ornithological work for a solar farm near Tamar Estuaries SPA and overseeing biodiversity planning for enhancements at Longleat Safari Park. He is licensed for protected species work and trained in field identification, first aid, and railway safety.

### 5.1.2 Relevant Legislation and Policy Context

An ecological impact assessment is a process of identifying, quantifying, and evaluating potential effects of development-related or other actions on habitats, species and ecosystems (CIEEM, 2024). The Proposed Development is sub-threshold for an Environmental Impact Assessment (EIA) under the Planning and Development Regulations 2001 , as amended.

When an EcIA is undertaken as part of an EIA process it is subject to the EIA Regulations (under the Planning and Development Regulations 2001). An EcIA is not a statutory requirement, however it is a best practice evaluation process. This EcIA is provided to assist the Competent Authority with its decision making in respect of the Proposed Development.

There are a number of pieces of legislation, regulations and policies specific to ecology which underpin assessment of the likely significant effects of the Proposed Development on the receiving biodiversity environment. These may be applicable at a European, National or Local level. Legislation at the International level relevant to the Proposed Development are listed below:

- *Council Directive 92/43/EEC* on the Conservation of Natural Habitats and of Wild Fauna and Flora; hereafter the 'Habitats Directive'.
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EIARs), Environmental Protection Agency (EPA, 2022).
- *Directive 2009/147/EEC*, hereafter the 'Birds Directive'.
- *Directive 2011/92/EU*, hereafter the 'EIA Directive'.
- EU Regulation 1143/2014, on Invasive Alien Species.
- *Convention on the Conservation of European Wildlife and Natural Habitats 1982*, hereafter the 'Bern Convention'
- *The Convention on the Conservation of Migratory Species of Wild Animals 1983*, hereafter the 'Bonn Convention'.
- *Ramsar Convention on Wetlands 1971*, hereafter referred to as 'Ramsar'.
- *Water Framework Directive 2000/60/EC*, hereafter the 'WFD'.

National legislation and policy relevant to the Proposed Development are listed below:

- Wildlife Act 1976, as amended.
- Flora (Protection) Order 2022.
- The Planning and Development Act 2000 as amended.
- The Planning and Development Act, 2024, as amended.
- National Biodiversity Plan 2023-2030.

Additionally, Natural 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 Special Areas of Conservation (SAC) and/or Special Protection Area

(SPA) sites. Although many NHA designations are not yet fully in force under the Wildlife Acts (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.

Local plans and policies relevant to the Proposed Development are listed below:

- *Galway City Development Plan (2023-2029),*
- *Galway County Development Plan (2022-2028)*
- *Galway City Biodiversity Action Plan (2014-2024 (present)).*

Further details on legislation and policy relevant to the Proposed Development are detailed in Volume III, Appendix I, of the EIAR.

## 5.2 Study Methodology

This Biodiversity Chapter has been undertaken to support 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.

### 5.2.1 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 significant effects at the appropriate stage of the Proposed Development.

### 5.2.2 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 2023 and updated in November 2024 and June 2025, relied on the following sources:

- Information on species records 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*;
- 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://housinggovie.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 Section 5.14, References.

#### *5.2.2.1 Bats*

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 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

Additionally, the NBDC website (www.nbdc.ie) was also interrogated for historical records of bats within the R55 10km grid square. According to Collins (2023), Irish bats typically have a Core Sustenance Zone (CSZ) of under 5km. A CSZ is defined as "*the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the resilience and conservation status of the colony using the roost*". A study by Sheil *et al.,* (1999) found Leisler's bats (*Nyctalus leisleri*) had a maximum foraging range of 13.4km. A similar study by Waters *et al.*, (1999) found Leisler's bats flew a mean maximum distance of 4.2km from the roost. The NBDC database offers a maximum search range of 10km. Therefore, this distance was chosen as the most suitable range to assess the effects on bat foraging and commuting.

#### *5.2.2.2 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, 2024). 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).*"

#### *5.2.2.3 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 EcIA reports such as this

Biodiversity Chapter 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., effects 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 Biospheres; and
- Regional development plans to identify any remaining sites or areas designated for nature conservation at a local level.

### 5.2.3 Field Surveys

To determine the likely ecological constraints at the site, a multidisciplinary walkover field survey was carried out on the 2nd of May 2024. This survey covered the following aspects:

- Habitat mapping to level 3 (Fossitt 2000)
- Preliminary Bat Roost Assessment and Habitat Suitability Survey

- Bird Scoping Survey
- Invasive Flora Survey
- A search for signs of protected fauna (e.g., mammals, reptiles, amphibians)

Details of the survey methods are given in the below sections.

#### *5.2.3.1 Habitats and Invasive Flora*

Habitat surveys of the site were conducted by DNV on the 2nd of May 2024 and updated in June 2024. 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. The habitats at the site were also assessed for their potential to support protected and/or notable fauna.

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.

Further dedicated habitat surveys were not required in 2025, owing to the nature of the habitats present on site (brownfield, heavily urbanised) which are considered unlikely to significantly change in the time that lapsed between the May 2024 survey and this submission. However, it should be noted that records were taken, where required, of any change/notable observation during the targeted bat and mammal surveys.

#### *5.2.3.2 Bats*

##### *5.2.3.2.1 Preliminary Habitat and Roost Suitability*

A daytime inspection of the site was undertaken on the 2nd of May 2024. The aim of the inspection was to search for indications of the presence of roosting bats, and to assess the habitat for its ability to support commuting and foraging bats. Buildings and trees on site were visually assessed from the ground with the aid of a torch and binoculars.

The roost inspection comprised a detailed inspection of structures and trees on site. These were subject to exterior and interior inspections (where possible/warranted) to search for evidence of bat use. This includes live and dead specimens, droppings, feeding remains, oil staining and noise (Collins 2023). Buildings were assessed for cracks and crevices, or entry points to the roof that might support roosting bats, while trees were searched for Potential Roosting Features (PRFs) such as hollow trunks, knot holes, peeling bark, splits, cracks, and crevices (Collins 2023; Andrews 2018).

Collins (2023) recommends that structures and trees are assessed for their ability to support roosting bats under separate categorisations using professional judgement and sub-categories as presented in Table 4.1 (Collins, 2023):

- Negligible – No suitable features observed, however, a small element of uncertainty remain;
- Low – A structure with one or more roost features as used by individual bats opportunistically at any time of year;
- Moderate – A structure with one or more roost features that could be used by bats on a regular basis or by a larger number of bats; and

- High – A structure 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. These features have the potential to support high conservation status roosts.

Trees are categorized separately according to Table 4.2 of Collins (2023). These classifications are:

- NONE – Either no PRFs in the tree or highly unlikely to be any;
- FAR – Further assessment required to establish if PRFs are present in the tree; and
- PRF – A tree with at least one PRF present.

Where a tree contains at least one PRF, each PRF is further assessed according to Table 6.2 (Collins 2023). PRFs are scored as either:

- PRF-I – PRF is only suitable for individual bats or very small numbers of bats either due to size or lack of suitable surrounding habitats.
- PRF-M – PRF is suitable for multiple bats and may therefore be used by a maternity colony.

#### *5.2.3.2.2 Bat Activity Survey*

The site was assessed by an experienced ecologist in relation to the potential bat foraging habitat and commuting routes. The survey was undertaken to best practice guidance (Collins, 2023 and Marnell et al., 2022) during suitable weather conditions, as detailed below in Table 5-1 below.

*Table 5-1 Survey effort for dusk activity surveys undertaken at the Site*

| Survey no. | Date | Sunset Time | Start Time | Finish Time | Weather Conditions |
|---|---|---|---|---|---|
| Transect Survey 1 of 1 | 04/06/2025 | 21:57 | 21:55 | 23:30 | Start of survey: Overcast, wind Beaufort 2, temp 13ºC.<br><br>End of survey: Drizzle, wind Beaufort 2, temp 11ºC. |

The surveyor was equipped with an Elekon Batlogger M2 detector and powerful L.E.D. torch and head torches. Surveys started at sunset and continued for 1-2 hours, along a predesigned transect route with regular point counts, as presented in Figure 5-1 below.




*Figure 5-1 Bat transect survey route and point count locations*

#### *5.2.3.2.3 Data Analysis*

Species were identified from recordings using Elekon's BatExplorer software (Version 2.1.10.1) and Kaleidoscope Pro software. Bat data was analysed, and species assigned to each record with reference to species identification guides such as Russ (2012).

Each record i.e., a sequence of bat calls/pulses, is noted as a bat pass; to indicate the level of bat activity for each species recorded. Each bat pass does not correlate to an individual bat but is representative of bat activity levels. Some bats such as *Pipistrelle* species may continuously fly around a habitat or feature, therefore, it is possible that a series of bat passes within a similar time frame is representative of an individual bat. On the other hand, Leisler's bats (*Nyctalus leisleri*) tend to travel through an area quickly, and as such, an individual sequence or bat pass is more likely to be indicative of individual bats.

### *5.2.3.3 Birds*

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, (2025). 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.

Each survey consists of a combination of walked transects of the site (being walked at a slow, ambling pace, stopping to scan priority habitat/features where appropriate) and vantage point observation from fixed points, as required. The flight-line survey component consists of vantage point observation by a surveyor using binoculars and identification guides where necessary to identify all target species in flight over the site.

All bird surveys were undertaken using:

- Opticron 8x42 binoculars (or equivalent).
- Opticron 20x Telescope (or equivalent).
- Agreed survey methodology.
- A4 map of the survey area.

#### *5.2.3.3.1 Bird Scoping Survey*

A bird scoping survey was carried out on the 2nd of May 2024 to scope out the breeding and non-breeding bird potential at the site based on habitats. Additionally, all bird species encountered during the survey were recorded and activity noted where possible.

#### *5.2.3.3.2 Breeding Bird Surveys*

To inform an evaluation of the on-site habitats for bird species, a single breeding bird survey was carried out on the 4th of June 2025 to determine the requirement for a suite of breeding bird surveys during the 2025 bird nesting season which runs from March – August, inclusive. It was determined that further breeding bird surveys were not required based on the low level of bird activity recorded and low habitat suitability present on the highly urbanised Site for breeding birds. The result of this survey is provided below in Section 5.3.4.3.2.

The breeding bird survey was completed in the early morning, commencing at or near dawn and lasting approximately 1.5 to 2.5 hours in duration. Survey dates and weather conditions are presented below in Table 5-2.

*Table 5-2 Date, Duration and Weather Conditions During the Breeding Bird Survey at the Proposed Development Site*

| Date | Duration (Hrs) | Weather Conditions/ |
|---|---|---|
| 04/06/2025 | 3 | Wind: F2; Light drizzle; 13°C; Visibility: good-excellent; Cloud: 8/8 |

#### *5.2.3.3.3 Wintering Bird Surveys*

Owing to the proximity of the Special Protection Area: Inner Galway Bay SPA (004031), and, to inform an evaluation of the on-site habitats for wintering bird species, 12 no. wintering bird surveys were conducted at the site during the winter 2024-2025 bird season. The objective of these surveys was:

- To assess the potential usage of the site by waterbirds during the winter months as an *ex-situ* site; and
- To determine the composition, numbers, frequency, and heights of species in flight over the site of the Proposed Development, if any, in order to inform decisions on potential disturbance to flight-lines of birds commuting to/from roost sites and/or between feeding sites as a result of the construction of the proposed buildings.

As the Proposed Development includes buildings up to 13-storeys in height, flight-line obstruction/collision risk is deemed to be a *potential* cause for concern and must be taken into consideration, in this instance. The flight-line surveys focus on those Species of Conservation Interest (SCI) species that are characterised as “poor” fliers and considered to be more at risk of collision (see Eirgrid, 2012, 2016 & 2020). The most at-risk groups (classified as ‘medium’ and ‘high’ collision risk species) include species commonly listed as SCIs such as wader species; waterfowl such as geese, swan, and duck species; and some raptor species. Gulls such as Herring Gull (*Larus argentatus)* are classed as ‘low’ collision risk species due to their superior manoeuvrability when flying and, therefore, are not classified as ‘at-risk’ species in terms of in-flight collisions with structures.

The wintering bird surveys comprised a visit every two weeks[1] from the months of October 2024 – March 2025 inclusive, with monthly visits counting the bird assemblage during a high tide and low tide event.

The surveys were carried out in suitable weather conditions and within daylight hours. Each transect lasted up to 3.75 hours in length. The transect routes were reversed during each visit in order to reduce the potential for time bias. Details of dates, weather conditions and timings are presented below in Table 5-3.

[1] +/- a few days owing to survey constraints e.g., weekends, bank holidays, etc.

*Table 5-3 Dates, Duration and Weather Conditions during the Wintering Bird Surveys at the Proposed Development Site*

| Date | Start/Finish Times | Duration (Hrs) | Weather Conditions |
|---|---|---|---|
| 31/10/2024 | 14:00-17:05 | 3 hours | Wind – F2<br>Precipitation – dry<br>Temp – 14°C<br>Visibility – excellent<br>Cloud – 75% increasing to 100% |
| 12/11/2024 | 13:30-17:00 | 3.5 hours | Wind – F1<br>Precipitation – dry<br>Temp – 11°C dropping to 10°C<br>Visibility – poor (dense fog for most of the day)<br>Cloud – full cloud cover |
| 25/11/2024 | 13:30-16:30 | 3 hours | Wind – F4 dropping to F3<br>Precipitation – dry<br>Temp – 8°C dropping to 7°C<br>Visibility – excellent<br>Cloud – 50% cloud cover |
| 16/12/2024 | 13:00-16:00 | 3 hours | Wind – F4<br>Precipitation – dry but rain towards the end of the survey<br>Temp – 11°C<br>Visibility – excellent<br>Cloud – 100% cloud cover |
| 06/01/2025 | 11:30-15:00 | 3.5 hours | Wind – F5<br>Precipitation – dry<br>Temp – 4°C<br>Visibility – Excellent<br>Cloud – 100% at the beginning dropping to <25% at the end |
| 20/01/2025 | 14:00-17:00 | 3 hours | Wind – F1<br>Precipitation - Dry<br>Temperature – 8°C<br>Visibility – excellent<br>Cloud – Full cloud cover |
| 04/02/2025 | 14:00-16:30 | 2.5 hours | Wind – F4<br>Precipitation – Wet to begin with then dry<br>Temperature – 7°C<br>Visibility – excellent<br>Cloud – Full cloud cover at the start then 75% at the end<br>Duration – 2.5 hours (14:00 – 16:30) |
| 19/02/2025 | 14:00-17:30 | 3.5 hours | Wind – F5<br>Precipitation – Wet to begin with then dry<br>Temperature – 11°C<br>Visibility – excellent<br>Cloud – Full cloud cover |
| 28/02/2025 | 14:00-17:45 | 3.75 hours | Wind – F3<br>Precipitation – Dry<br>Temperature – 9°C<br>Visibility – excellent<br>Cloud – 50% |
| 05/03/2025 | 14:00-17:30 | 3.5 hours | Wind – F4<br>Precipitation – Dry<br>Temperature – 11°C<br>Visibility – excellent<br>Cloud – Full cloud cover |
| 21/03/2025 | 14:45-18:15 | 3.5 hours | Wind – F2 |

| Date | Start/Finish Times | Duration (Hrs) | Weather Conditions |
|---|---|---|---|
| | | | Precipitation – Dry with rain at the end of the survey<br>Temperature – 13°C dropping to 12°C<br>Visibility – excellent<br>Cloud – started as 75% increasing to full cloud cover |
| 31/03/2025 | 14:00-17:00 | 3 hours | Wind – F2<br>Precipitation – Dry.<br>Temperature – 16°C<br>Visibility – excellent<br>Cloud – Full cloud cover |

#### *5.2.3.4 Mammal Surveys*

A systematic search for mammals was carried out in conjunction with the ecological walkovers completed on the 2nd of May 2025.

During this survey, the site was searched for tracks and signs of mammals e.g., scat, prints, hair, and burrows as per best practice guidelines. The habitat types recorded throughout the survey area were used to assist in identifying the fauna considered likely to utilise the area. This survey was carried out at a suitable time for mammal surveys and no difficulties were encountered in this regard.

Furthermore, any incidental observations of evidence for badgers (*Meles meles*) were recorded, were they encountered 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.

All waterbodies and adjacent habitats within 150m of the site were assessed for the presence of otter (*Lutra lutra*) and for the suitability to support otters. This involved searching for associated field signs, such as spraints, footprints, anal jelly, holts and couches to best practice guidelines (NRA, 2008). A particular focus was placed on the Galway Bay estuary along the eastern and southern boundaries of the site.

The winter/early spring period is considered to be advantageous when surveying for mammals, due to the vegetation tending to have died back, allowing easier identification of mammal dwellings located in dense scrub.

#### *5.2.3.5 Dedicated Otter Survey*

A dedicated otter survey was conducted on the 4th of June 2025 by BMcC, a suitably experienced ecologist, in accordance with best practice guidance outlined by CIEEM and detailed in resources such as *Monitoring the Otter (Chanin. P, 2003)*. The survey methodology involved a systematic search of suitable habitats, rivers, streams, lakes, estuaries, and wetlands, within at least 200 metres of the Proposed Development. Fieldwork was timed to avoid periods of high-water flow and adverse weather conditions such as heavy rain, frost, or snow, which can obscure evidence, and was ideally carried out during late afternoon when otter activity is more likely. The focus of the survey was on identifying signs of otter presence and activity, including spraints (droppings), footprints, feeding remains, slides, and potential resting sites such as holts and couches. The surveyor walked both banks of watercourses where relevant and where access allowed, inspecting prominent features such as rocks, tree

roots, and under bridges. Were it required, camera traps would be subsequently deployed at suspected holts to confirm usage and monitor activity, particularly in sensitive areas such as natal holts. However, this was not required based on a lack of suspected holts/activity during the otter survey. Any evidence of otter activity is ordinarily recorded with GPS coordinates, photographs, and habitat descriptions; however, a lack of evidence would result in the absence of this data. Please refer to Section 5.3.4.4.2.2. Surveys were conducted without causing a disturbance and in compliance with legal protections under both the Habitats Directive and the Wildlife Act (Ireland).

#### *5.2.3.6 General Faunal Surveys*

A general fauna survey of the site was carried out in conjunction with the walkover field survey on the 2nd of May 2025 The habitat types recorded throughout the survey area were used to assist in identifying the fauna considered likely to utilise the area, such as reptiles or amphibians (as per HGBI, 1998). Furthermore, the site was searched for tracks and signs of mammals as per Bang and Dahlstrom (2001) and the *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes* by the National Road Authority (NRA, 2005). This survey considered 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 exist or no targeted surveys were carried out for this assessment.

Furthermore, it should be noted that during the course of all surveys at the site of the Proposed Development, cognisance was given to other species of fauna that might use the site. These are included in this assessment where applicable.

### 5.2.4 Ecological Assessment

This Biodiversity 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, 2024); 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.

#### *5.2.4.1 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 of the EIAR. 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.

#### *5.2.4.2 Impact Assessment*

As per the NRA guidelines (2009), 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 Guideline (EPA, 2022), presented in Appendix 5-2 of the EIAR. These guidelines set out a number of parameters that should be considered when determining which elements of the Proposed Development could constitute impact 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 which affects 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.

#### *5.2.4.3 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 (see Section 5.1.2) were reviewed to identify any potential for negative cumulative impacts with the Proposed Development. Additionally, existing planning permissions from the past five years (from 2020 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.

#### *5.2.4.4 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[2] for any

[2] These are not compensatory measures in the context of the requirements of Article 6(4) of the Habitats Directive as they would not be compensating for an impact that would adversely affect the integrity of any European site. Any potential impact on European sites is assessed in the NIS. For clarity, in this instance, the NIS concluded that the Proposed Development will not result in such an impact on any European site

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 ecological impact assessment 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 an ecological impact assessment, 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[3].
- 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.

### 5.2.5 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.
- The dedicated otter survey was carried out on the 4th of June 2025, and, while otter surveys can be carried out year-round, under good weather conditions, the ideal time is in early spring/autumn when vegetation has died back. However, owing to the distinct lack of vegetation cover on the site, which is heavily modified, within an already heavily urbanised landscape, this is not considered to present a significant limitation to this assessment.

[3] As above: These are not compensatory measures in the context of the requirements of Article 6(4) of the Habitats Directive as they would not be compensating for an impact that would adversely affect the integrity of any European site. Any potential impact on European sites is assessed in the NIS.

## 5.3 The Existing and Receiving Environment (Baseline Situation)

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

### 5.3.1 Geology, Hydrogeology and Hydrology

The site is located in the *Galway Bay South-East* Catchment (I.D. 29) and in the *Carrowmoneash [Oranmore]_SC_010* sub-catchment (I.D. 29_6).

The site of the Proposed Development is located approximately 600m to the east of the River Corrib (IE_WE_30C020600). The River Corrib deposits into the Corrib Estuary transitional waterbody (IE_WE_170_0700), which is immediately adjacent to the site of the Proposed Development. The site is situated on the *Clarinbridge* groundwater body (IE_WE_G_0008), and the vulnerability to contamination of said groundwater from human activities is classified as predominantly 'Low', with a small section to the south of the site being classified as 'Moderate' (GSI, 2025). The Aquifer type in the surrounding area is 'Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones' (GSI, 2025).

The soil underneath the site of the Proposed Development is classified as 'Deep well drained mineral soil derived from mainly basic parent materials' and 'Made', and the underlying quaternary sediments are a combination of 'Urban' and 'Till derived from limestones' (GSI, 2025). The Waterbody Status for the waterbodies relevant to the site as recorded by the EPA (2022) in accordance with European Communities Regulations 2003 (SI no. 722/2003) are provided in Table 5-4.

*Table 5-4 WFD Risk and Water Body Status.*

| Waterbody Name | Water body; EU code | Location from Site | Distance from Site (km) | WFD water body status (2016-2021) | WFD 3rd cycle Risk Status | Hydraulic Connection to the Site |
|---|---|---|---|---|---|---|
| **Surface Water Bodies** | | | | | | |
| River Corrib | IE_WE_30C 020600 | West | 0.62 | Good | Not at risk | Upstream of the site |
| Corrib Estuary | IE_WE_170_ 0700 | South | 0.0 | Moderate | Not at risk | Immediately adjacent to the site |
| **Groundwater Bodies** | | | | | | |
| Clarinbridge Groundwater Body | IE_EA_G_00 08 | N/A | N/A | Good | Review | Underlying groundwater-body |

### 5.3.2 Designated Sites

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 (2009/4147/EC) seeks to protect birds of special importance by the designation of Special Protection Areas (SPAs). It is the responsibility of each member state to designate SPAs and SACs, both of which will form part of Natura 2000, a network of protected sites throughout the European Community. SACs are selected for the conservation of Annex I habitats (including priority types which are in danger of disappearance) and Annex II species (other than birds). SPAs are selected for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats. The annexed habitats and species for which each site is selected correspond to the qualifying interests of the sites; from these, the conservation objectives of the site are derived.

All European sites potentially linked to the Proposed Development site have been identified and fully assessed in the AA Screening Report (Stage 1 AA, 2025a) and NIS (DNV, 2025b) accompanying this submission under separate cover. A summary of the AA conclusions is given below in Section 5.3.2.1

Other nationally or internationally designated sites potentially linked to the Proposed Development site are identified in Section 5.3.2.2

#### *5.3.2.1 European Sites*

The following is extracted from the AA Screening for this site (DNV, 2025a), which is provided in full, under separate cover:

"*The Proposed Development at Galway Port, Co. Galway, has been assessed taking into account:*

- *The nature, size and location of the proposed works and possible impacts arising from the site during construction and operation.*
- *The QIs and conservation objectives of the European sites.*
- *The potential for in-combination effects arising from other plans and projects.*

*In conclusion, upon the examination, analysis and evaluation of the relevant information and applying the precautionary principle, it is concluded by the authors of this report that the possibility cannot be excluded that the Proposed Development will have a significant effect on any of the European sites listed below:*

- *Galway Bay Complex SAC (000268),*
- *Inner Galway Bay SPA (004031),*
- *Lough Corrib SAC (000297),*
- *Lough Corrib SPA (004042).*

*On the basis of the screening exercise carried out above, it can be concluded, on the basis of the best scientific knowledge available and objective information, that the possibility of any significant effects on the above five listed European sites, whether arising from the project itself or in combination with other plans and projects,* ***cannot be excluded*** *in light of the above listed European sites' conservation objectives. Thus, there is a requirement to proceed to*

*Stage 2 of the Appropriate Assessment process; and a NIS has been prepared and accompanies this submission under separate cover*[4]".

The following is extracted from the Natura Impact Statement (NIS) for the site, which is included in full, as part of this application, under separate cover:

"*This Natura Impact Statement details the findings of the Stage 2 Appropriate Assessment conducted to further examine the potential direct and indirect impacts of the construction and operational phases of the Proposed Development on the following European sites:*

- *Galway Bay Complex SAC (000268),*
- *Inner Galway Bay SPA (004031),*
- *Lough Corrib SAC (000297),*
- *Lough Corrib SPA (004042).*

*The above sites were identified by a screening exercise that assessed likely significant effects of a range of impacts that have the potential to arise from the Proposed Development. The Appropriate Assessment investigated the potential direct and indirect effects of the proposed works, during the construction phase, on the integrity and qualifying interests of the above European Site, alone and in combination with other plans and projects, taking into account the site's structure, function and conservation objectives. There is no potential for significant effects during Operation.*

*Where potentially significant effects were identified, a range of mitigation and avoidance measures have been suggested to avoid them. This NIS has concluded that, once the avoidance and mitigation measures are implemented as proposed, the Proposed Development will not have an adverse effect on the integrity of the above European sites, individually or in combination with other plans and projects. Where applicable, a suite of monitoring surveys has been proposed to confirm the efficacy of said measures in relation to ensuring no adverse impacts on the habitats of the relevant European sites have occurred.*

*As a result of the complete, precise and definitive findings in of this NIS, it has been concluded, beyond reasonable scientific doubt, that the Proposed Development will have no significant adverse effects on the QIs, SCIs and on the integrity and extent of the aforementioned European sites. Accordingly, the Proposed Development will not adversely affect the integrity of any relevant European site*".

As such, European sites are not considered further within this Chapter.

#### *5.3.2.2 Natural Heritage Areas/proposed Natural Heritage Areas (NHA/pNHA)*

Natural 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.

[4] The NIS report is also available for review in Appendix 5-4 of this EIAR.

Potential impact pathways (S-P-R links) to relevant NHA/pNHAs are discussed in Section 5.3.2.6 below.

#### *5.3.2.3 Irish Wetland Bird Survey (I-WeBs)*

An I-WeBS site refers to a designated wetland area in Ireland that is monitored as part of the Irish Wetland Bird Survey (I-WeBS), a national programme coordinated by BirdWatch Ireland in partnership with the National Parks and Wildlife Service (NPWS). The survey tracks population trends of wintering waterbirds and assesses the condition of their wetland habitats. Since its inception over 25 years ago, I-WeBS has covered approximately 250 sites and 750 subsites annually, providing critical data for the conservation of over 50 species of migratory waterbirds. These sites are essential for understanding ecological health, informing environmental policy, and evaluating the impacts of development and climate change on wetland ecosystems.

Galway Bay is a designated I-WeBS Site, Site code: 0G403 (Figure 5-2). There are numerous subsites within this site, however, the two of most relevance to this Report are: Lough Atalia (subsite code: OG032), and Nimmo's Pier and Dock's (Subsite code: OG498) which occur adjacent to the Proposed Development.

Lough Atalia is a tidal lagoon located immediately east of Galway city centre. It is bordered by urban infrastructure but retains significant ecological value, particularly for wintering and migratory bird species. The shoreline supports a variety of habitats, including mudflats and saltmarsh, which attract waders, gulls, and waterfowl. The area is also a popular walking route, offering opportunities for public engagement with nature.

Nimmo's Pier, which is situated at the mouth of the River Corrib, is a historic maritime structure designed by Scottish engineer Alexander Nimmo in the early 19th century. It remains a functioning pier and is a well-known birdwatching location. The site supports a range of seabirds, including gulls, terns, cormorants, and oystercatchers, and provides important roosting and foraging habitat for species using the wider Galway Bay area.

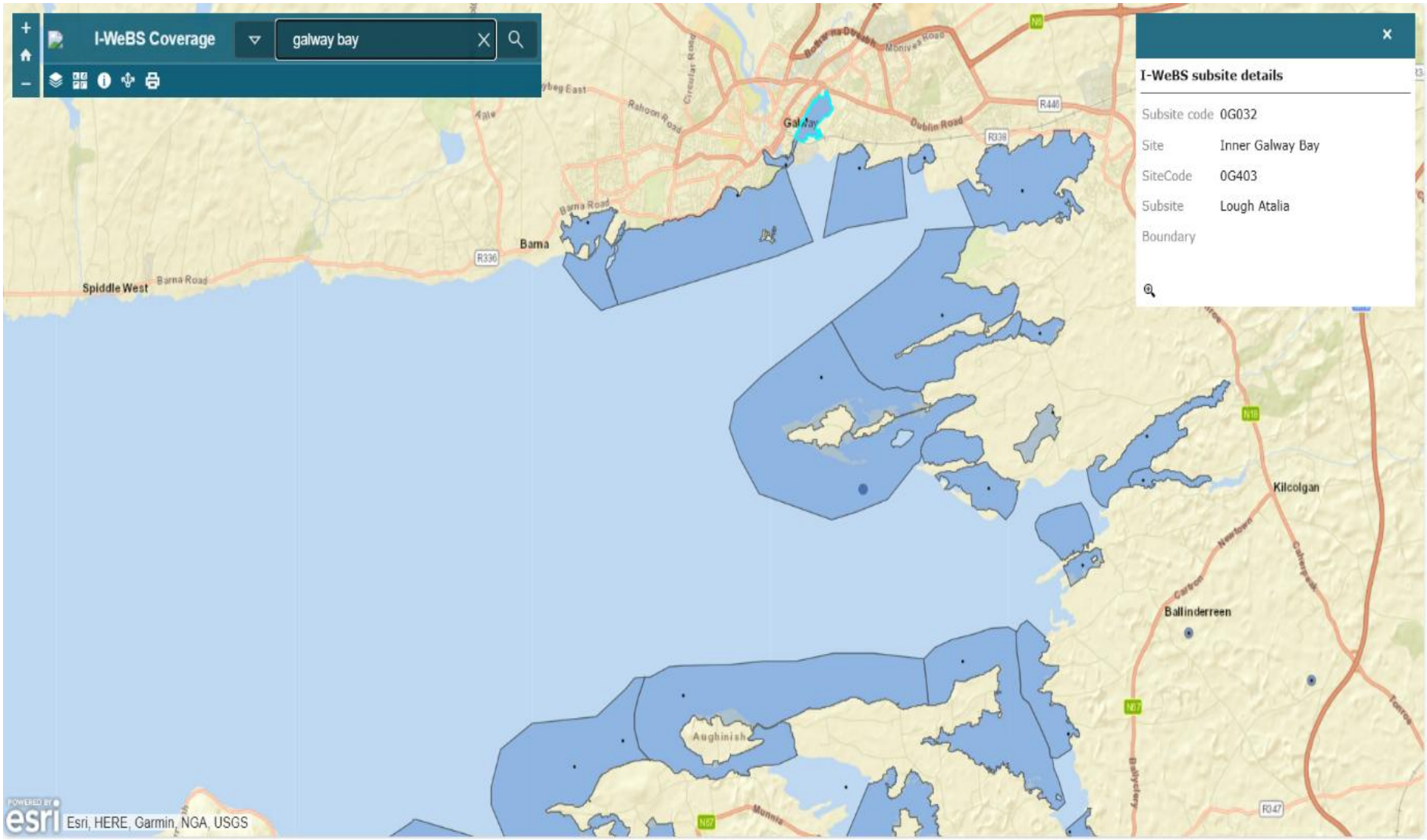



*Figure 5-2 Showing Galway Bay, designated I-WeBS Site.*

#### *5.3.2.4 Ramsar Site*

A Ramsar Site is a wetland area designated under the Ramsar Convention on Wetlands of International Importance, an international treaty adopted in 1971 to promote the conservation and sustainable use of wetlands. These sites are recognized for their ecological, botanical, zoological, limnological, or hydrological significance, particularly as habitats for waterfowl and other biodiversity.

Galway Bay, specifically Inner Galway Bay, is designated as a Ramsar Site (Site Code: 838) and was officially listed on 7 June 1996 (Figure 5-3). Covering an area of approximately 11,904 hectares, it is a large, marine-dominated wetland located on Ireland's west coast. The site features a diverse shoreline composed of bedrock, shingle, sandy beaches, and fringing salt marshes, along with intertidal sand and mudflats, small islands, and rocky islets.

This Ramsar site supports:

- A significant colony of common seal (*Phoca vitulina*)
- A breeding population of otter (*Lutra lutra*)

In addition, it also supports five bird species listed in Annex I of the EU Birds Directive, including:

- Black-throated diver (*Gavia arctica*)
- Great northern diver (*Gavia immer*)
- Golden plover (*Pluvialis apricaria*)
- Sandwich tern (*Thalasseus sandvicensis*)
- Common tern (*Sterna hirundo*)

The site is also used for recreation and education, though it faces ecological pressures from aquaculture, urban expansion, eutrophication, and overharvesting of species such as the purple sea urchin (*Paracentrotus lividus*).

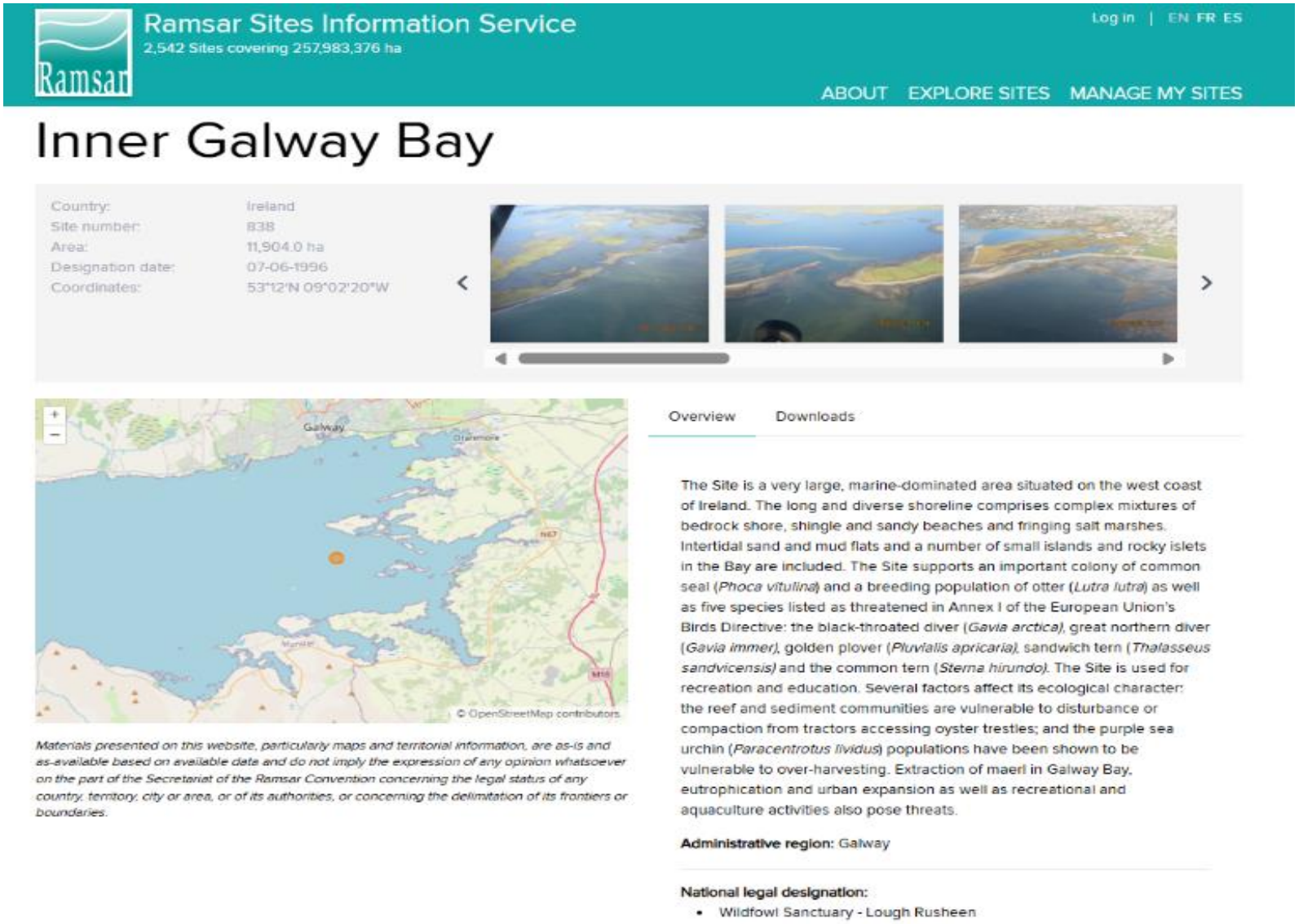



*Figure 5-3 Showing Inner Galway Bay, Designated RAMSAR Site*

#### *5.3.2.5 Important Bird Areas (IBAs)*

Important Bird and Biodiversity Areas (IBAs) are sites of international significance for the conservation of bird populations, identified using standardized, globally recognized criteria developed by BirdLife International. These areas support key species during breeding, wintering or migration, and are often critical for maintaining global bird diversity. While not legally protected by themselves, IBAs often overlap with statutory conservation designations such as Special Protection Areas (SPAs) and Ramsar Sites.

Galway Bay, specifically Inner Galway Bay, is designated as an IBA under the code IE083. The site comprises the shallow, more sheltered part of the bay, located on the west coast of Ireland between County Galway and County Clare. It is partially protected from the Atlantic Ocean by the Aran Islands, creating a unique marine and coastal environment.

This IBA supports:

- Internationally important populations of wintering waterbirds, including species such as the Great Northern Diver (*Gavia immer*), Light-bellied Brent Goose (*Branta bernicla hrota),* and Black-tailed Godwit (*Limosa limosa*).
- Extensive intertidal habitats, including mudflats, sandflats, and saltmarshes, which provide essential feeding and roosting grounds.
- A diverse assemblage of seabirds, waders, and wildfowl, many of which are listed under Annex I of the EU Birds Directive.

The site is also used for aquaculture, fishing, and recreation, and is subject to pressures from urban development and water quality issues, making its conservation status particularly important for regional biodiversity.

#### *5.3.2.6 S-P-R links to Other Designated Sites*

Potential impact pathways are discussed in the following sections in the context of the Proposed Development as described in Section 5.4.

##### *5.3.2.6.1 Hydrological Pathways*

The site is immediately adjacent to Galway Bay and Lough Atalia, and as such, a potential hydrological pathway exists between the site and any designated sites in these waters. There is one designated site within this area; *Galway Bay Complex pNHA (000268)*. The boundary of this pNHA overlaps with the European sites in Galway Bay (*Galway Bay Complex SAC* and *Inner Galway Bay SPA*), and as such, this pNHA can be screened out by proxy as per the screening decisions and mitigation measures outlined in the accompanying NIS (DNV, 2025b). Therefore, the hydrological pathway to this designated site is not discussed further in this chapter.

While the Proposed Development is downstream of *Lough Corrib pNHA (000297)*, the Lough is designated for mobile aquatic species such as otter (*Lutra lutra*). The boundary of this pNHA overlaps with two European sites: Lough Corrib SAC & SPA, both of which have been assessed and mitigated for in the NIS report which is available under separate cover and appended to this Report (Appendix 5-4). As such, this pNHA can also be screened out by proxy as per the screening decisions and mitigation measures outlined in the accompanying NIS (DNV, 2025a).

Given the distance to the next nearest designated site (*Black Head-Poulsallagh Complex (000020)*; >17km) via Galway Bay, no other designated sites are considered as having hydrological pathways with the Proposed Development.

#### *5.3.2.6.2 Hydrogeological Pathways*

During groundworks and other construction activities, the ground will be exposed and any potential accidental discharges to ground could potentially migrate vertically downward to the underlying bedrock aquifer and laterally within the aquifer to the downgradient/overlapping Galway Bay Complex pNHA. As such a hydrogeological pathway can be considered to exist between the Proposed Development and this designated site. However, as per the previous section, this pNHA overlaps the boundary of Galway Bay Complex SAC and as a result, is assessed and screened by proxy in the NIS, which is appended to this Report (Appendix 5-4).

Given the distance to the next nearest designated site (*Black Head-Poulsallagh Complex (000020)*; >17km) via Galway Bay, no other designated sites are considered as having hydrogeological pathways with the Proposed Development.

#### *5.3.2.6.3 Air/Land Pathways*

The construction and operational phases of the Proposed Development could introduce dust, noise and vibrational impacts transferable via air and land pathways, as well as increased lighting and human activity at the site and in the vicinity of the site. The site is located on the coast of the Irish Sea and is immediately adjacent to the Galway Bay Complex pNHA and Inner Galway Bay SPA. Therefore, a land and air pathway exists between the Proposed Development and these designated sites. As per the previous section above, the pNHA is assessed and mitigated for by proxy in the NIS, due to overlapping boundaries with Galway Bay Complex SAC, and can be screened out accordingly, as per the screening decisions and mitigation measures outlined in the accompanying NIS (DNV, 2025a), which is appended to this Report (Appendix 5-4).

Further assessment of construction phase noise and vibration impacts on protected sites (specifically SPAs and SACs and overlapping pNHAs by proxy) are provided for in Section 10.5.1.3 of this Report.

Given the distance to the next nearest designated site (*Lough Corrib pNHA (000297); 1.6km via air)*, no other designated sites are considered as having air/land pathways with the Proposed Development.

In addition, as with the above pNHA sites, the following sites also have overlapping boundaries with Galway Bay Complex SAC and Inner Galway Bay SPA, and can also be screened out for potential hydrological, hydrogeological, and land/air pathways by proxy as per the screening decisions and mitigation measures outlined in the accompanying NIS:

- Galway Bay I-WeBS Site (Site code: 0G403)
- Galway Bay Ramsar Site (Site code: 838)
- Galway Bay IBA Site (Site code: IE083)

#### *5.3.2.7 Summary of S-P-R Assessment*

The site is located immediately adjacent to Galway Bay and Lough Atalia, creating a potential hydrological connection between the site and designated conservation areas within these waterbodies. One such designated site is the Galway Bay Complex pNHA (Site Code: 000268), whose boundary overlaps with the Galway Bay Complex SAC and the Inner Galway Bay SPA. Additionally, the Proposed Development is situated downstream of Lough Corrib pNHA (Site Code: 000297), which is designated for mobile aquatic species such as otter (Lutra lutra) and a variety of bird species. The next nearest designated site with a potential hydrological connection is the Black Head–Poulsallagh Complex pNHA (Site Code: 000020), located over 17 km away via Galway Bay. However, given this distance, no hydrological or hydrogeological pathways are considered to exist between the Proposed Development and the Black Head–Poulsallagh Complex pNHA.

It is considered that during groundworks and other construction activities, exposed ground may result in accidental discharges (e.g., polluted soil/sediment, fuel) that could migrate vertically into the underlying bedrock aquifer and laterally toward the downgradient Galway Bay Complex pNHA, establishing a potential hydrogeological pathway.

In terms of air and land-based pathways, the construction phase may introduce dust, noise, vibration, increased lighting, and human activity, all of which could affect nearby sensitive receptors. The site's coastal location adjacent to the Galway Bay Complex pNHA and Inner Galway Bay supports the existence of such pathways. The next nearest designated site with potential air/land connectivity is Lough Corrib pNHA, located approximately 1.6 km away. No other designated sites are considered to have relevant air or land pathways with the Proposed Development.

As the boundaries of the Galway Bay Complex pNHA and Lough Corrib pNHA overlap with Natura 2000 sites (SACs and SPAs), potential impacts on these areas have by proxy been fully assessed and mitigated for within the accompanying NIS.

In addition, no indirect pathways to any nationally or internationally designated sites (excl. SACs/SPAs) were identified.

Further information for all designated sites that have been considered and assessed in this section are shown in Figure 5-4. These sites are considered to be of national importance.

Galway Bay is an area of exceptional ecological value, designated under multiple conservation frameworks, as identified in this report, including the Irish Wetland Bird Survey (I-WeBS) (Site Code: 0G403), the Ramsar Convention (Site Code: 838), and BirdLife IBA network (Site Code: IE083).

These designations reflect the Bay's critical role in supporting internationally important populations of wintering and migratory waterbirds, as well as its diverse intertidal and subtidal habitats. The Proposed Development, located adjacent to Galway Bay, has the potential to exert a range of direct and indirect pressures on these sensitive ecological receptors.

Key concerns include increased disturbance from construction and operation phase related noise, lighting, and human activity, which may disrupt foraging and roosting behaviour of bird species. In addition to the potential for surface water runoff, sedimentation, and accidental pollution during both construction and operational phases, which could degrade water quality and intertidal habitats, thereby affecting invertebrate prey availability and overall ecosystem

function. In terms of land/air impacts, airborne pollutants released during the construction phase to the adjacent coastal areas could potentially further compound these impacts.

However, as with Section 5.3.2.6.3 above, having regard for these sites and their ecological sensitivities, and the overlap between these sites and Galway Bay Complex SAC (000268) and Inner Galway Bay SPA (004031), it is considered that impacts on same arising from the Proposed Development have been considered and mitigated in the NIS report that accompanies this submission.

#### *5.3.2.8 Relevant Designated Sites*

A designated site will only be at risk from likely significant effects where an S-P-R link of note exists between the Proposed Development and the designated site. All designated sites considered as part of the S-P-R method are listed in Table 5-5 and their relative location to the Site is shown in Figure 5-5. Those sites with notable S-P-R links to the Proposed Development are assessed further in this report as KERs of 'National Importance' (pNHAs and NHAs) or 'International Importance' (SACs/SPAs, UNESCO sites, IWeBs sites, Ramsar sites, IBAs, etc.).

As no other designated sites with notable S-P-R links to the Proposed Development were identified in the preceding steps, no further assessment of potential impacts on designated sites is required in this report.

*Table 5-5 Designated sites Considered with the Source-Pathway-Receptor (S-P-R) Method to Establish Notable Links Between the Sources of Effects Arising from the Proposed Development and any Relevant Designated Sites. Those sites with Notable S-P-R links that are Further Assessed in this Chapter are Highlighted in Green (if any).*

| Site Name & Code (Receptor) | Designation Rationale / Site Description | Potential Pathway to receptors |
|---|---|---|
| **Potential Natural Heritage Areas (pNHA)** | | |
| Galway Bay Complex pNHA (000268) | *no designation rationale or site description available, assumed to overlap with Galway Bay Complex SAC (NPWS, 2013a) and Inner Galway Bay SPA (NPWS, 2013b).*<br><br>**Habitats**<br>• Mudflats and sandflats not covered by seawater at low tide [1140]<br>• Coastal lagoons [1150]<br>• Large shallow inlets and bays [1160]<br>• Reefs [1170]<br>• Perennial vegetation of stony banks [1220]<br>• Vegetated sea cliffs of the Atlantic and Baltic Coasts [1230]<br>• Salicornia and other annuals colonizing mud and sand [1310]<br>• Atlantic salt meadows (Gl*auco-Puccinellietalia maritimae*) [1330]<br>• Mediterranean salt meadows (*Juncetalia maritimi*) [1410]<br>• Turloughs [3180]<br>• *Juniperus communis* formations on heaths or calcareous grasslands [5130]<br>• Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210]<br>• Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [7210]<br>• Alkaline fens [7230]<br>• Limestone pavements [8240]<br>**QI Species**<br>• Otter (*Lutra lutra*) [1355]<br>• Harbour seal (*Phoca vitulina*) [1365]<br>**SCI Birds**<br>• Common Teal (*Anas crecca*) [A052]<br>• Eurasian Wigeon (*Anas penelope*) [A050]<br>• Grey Heron (*Ardea cinerea*) [A028]<br>• Ruddy Turnstone (*Arenaria interpres*) [A169]<br>• Brent Goose (*Branta bernicla hrota*) [A046]<br>• Dunlin (*Calidris alpina*) [A149] | **Land/Air/Hydrological** – these pathways have been assessed by proxy in the AA Screening and NIS.<br><br>**Mitigation provided within NIS to include water quality protection measures, protection from noise, light and other visual disturbance to species.** |

| Site Name & Code (Receptor) | Designation Rationale / Site Description | Potential Pathway to receptors |
|---|---|---|
| | • Common Ringed Plover (*Charadrius hiaticula*) [A137]<br>• Black-headed Gull (*Chroicocephalus ridibundus*) [A179]<br>• Black-throated Diver (*Gavia arctica*) [A002]<br>• Great Northern Diver (*Gavia immer*) [A003]<br>• Mew Gull (*Larus canus*) [A182]<br>• Bar-tailed Godwit (*Limosa lapponica*) [A157]<br>• Red-breasted Merganser (*Mergus serrator*) [A069]<br>• Eurasian Curlew (*Numenius arquata*) [A160]<br>• Great Cormorant (*Phalacrocorax carbo*) [A017]<br>• Eurasian Golden Plover (*Pluvialis apricaria*) [A140]<br>• Common Tern (*Sterna hirundo*) [A193]<br>• Sandwich Tern (*Sterna sandvicensis*) [A191]<br>• Common Redshank (*Tringa totanus*) [A162]<br>• Northern Lapwing (*Vanellus vanellus*) [A142] | |
| Lough Corrib pNHA (000297) | *no designation rationale or site description available, assumed to overlap with Lough Corrib SAC (NPWS, 2017)*<br><br>**Habitats**<br>• Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110]<br>• Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoeto-Nanojuncetea* [3130]<br>• Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp. [3140]<br>• Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]<br>• Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210]<br>• *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410]<br>• Active raised bogs [7110]<br>• Degraded raised bogs still capable of natural regeneration [7120]<br>• Depressions on peat substrates of the *Rhynchosporion* [7150]<br>• Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [7210]<br>• Petrifying springs with tufa formation (*Cratoneurion*) [7220]<br>• Alkaline fens [7230] | **Hydrological (Indirect)** – Given the designation of Lough Corrib for mobile aquatic species, a hydrological pathway exists between the Proposed Development and the species therein.<br><br>**Mitigation provided within NIS to include water quality protection measures, protection from noise, light and other visual disturbance to species.** |

| Site Name & Code (Receptor) | Designation Rationale / Site Description | Potential Pathway to receptors |
|---|---|---|
| | • Limestone pavements [8240]<br>• Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]<br>• Bog woodland [91D0]<br><br>**Species**<br>• Freshwater pearl mussel (*Margaritifera margaritifera*) [1029]<br>• White-clawed crayfish (*Austropotamobius pallipes*) [1092]<br>• Sea lamprey (*Petromyzon marinus*) [1095]<br>• Brook lamprey (*Lampetra planeri*) [1096]<br>• Salmon (*Salmo salar*) [1106]<br>• Lesser horseshoe bat (*Rhinolophus hipposideros)* [1303]<br>• Otter (*Lutra lutra*) [1355]<br>• Slender Naiad (*Najas flexilis*) [1833]<br>• Slender green feather moss (*Hamatocaulis vernicosus*) [6216] | |
| Black Head-Poulsallagh Complex pNHA (000020) | *no designation rationale or site description available, assumed to overlap with Black Head-Poulsallagh Complex SAC (000020)*<br><br>**Habitats**<br>• Reefs [1170]<br>• Perennial vegetation of stony banks [1220]<br>• Fixed coastal dunes with herbaceous vegetation ("grey dunes") [2130]<br>• Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]<br>• Alpine and Boreal heaths [4060]<br>• Juniperus communis formations on heaths or calcareous grasslands [5130]<br>• Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210]<br>• Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) [6510]<br>• Petrifying springs with tufa formation (*Cratoneurion*) [7220]<br>• Limestone pavements [8240]<br>• Submerged or partially submerged sea caves [8330]<br><br>**Species**<br>• Petalwort (*Petalophyllum ralfsii*) | **None** – given the distance (>16km) between the Proposed Development and this designated site, no pathway exists. |
| **Other Designated Sites** | | |

| Site Name & Code (Receptor) | Designation Rationale / Site Description | Potential Pathway to receptors |
|---|---|---|
| I-WeBS Site<br><br>(Site code: 0G403) | *There are numerous subsites within this site, however the two of most relevance to this Report are: Lough Atalia (subsite code: OG032), and Nimmo's Pier and Dock's (Subsite code: OG498) which occur adjacent to the Proposed Development.*<br><br>*Lough Atalia is a tidal lagoon located immediately east of Galway city centre. It is bordered by urban infrastructure but retains significant ecological value, particularly for wintering and migratory bird species. The shoreline supports a variety of habitats, including mudflats and saltmarsh, which attract waders, gulls, and waterfowl. The area is also a popular walking route, offering opportunities for public engagement with nature.*<br><br>*While Nimmo's Pier, which is situated at the mouth of the River Corrib, is a historic maritime structure designed by Scottish engineer Alexander Nimmo in the early 19th century. It remains a functioning pier and is a well-known birdwatching location. The site supports a range of seabirds, including gulls, terns, cormorants, and oystercatchers, and provides important roosting and foraging habitat for species using the wider Galway Bay area.* | **Land/Air/Hydrological** – these pathways have been assessed by proxy in the AA Screening and NIS.<br><br>**Mitigation provided within NIS to include water quality protection measures, protection from noise, light and other visual disturbance to species.** |
| Ramsar Site<br><br>(Site Code: 838) | *Covering an area of approximately 11,904 hectares, it is a large, marine-dominated wetland located on Ireland's west coast. The site features a diverse shoreline composed of bedrock, shingle, sandy beaches, and fringing salt marshes, along with intertidal sand and mudflats, small islands, and rocky islets.*<br><br>*This Ramsar site supports:*<br><br>• *A significant colony of common seal (Phoca vitulina)*<br><br>• *A breeding population of otter (Lutra lutra)*<br><br>*In addition, it also supports five bird species listed in Annex I of the EU Birds Directive, including:*<br><br>• *Black-throated diver (Gavia arctica)*<br><br>• *Great northern diver (Gavia immer)*<br><br>• *Golden plover (Pluvialis apricaria)* | **Land/Air/Hydrological** – these pathways have been assessed by proxy in the AA Screening and NIS.<br><br>**Mitigation provided within NIS to include water quality protection measures, protection from noise, light and other visual disturbance to species.** |

| Site Name & Code (Receptor) | Designation Rationale / Site Description | Potential Pathway to receptors |
|---|---|---|
| | • *Sandwich tern (Thalasseus sandvicensis)*<br>• *Common tern (Sterna hirundo)* | |
| IBA Site<br>(Site code: IE083) | *This IBA supports:*<br>• *Internationally important populations of wintering waterbirds, including species such as the Great Northern Diver (Gavia immer), Light-bellied Brent Goose (Branta bernicla hrota), and Black-tailed Godwit (Limosa limosa).*<br>• *Extensive intertidal habitats, including mudflats, sandflats, and saltmarshes, which provide essential feeding and roosting grounds.*<br>• *A diverse assemblage of seabirds, waders, and wildfowl, many of which are listed under Annex I of the EU Birds Directive.* | **Land/Air/Hydrological** – these pathways have been assessed by proxy in the AA Screening and NIS.<br>**Mitigation provided within NIS to include water quality protection measures, protection from noise, light and other visual disturbance to species.** |

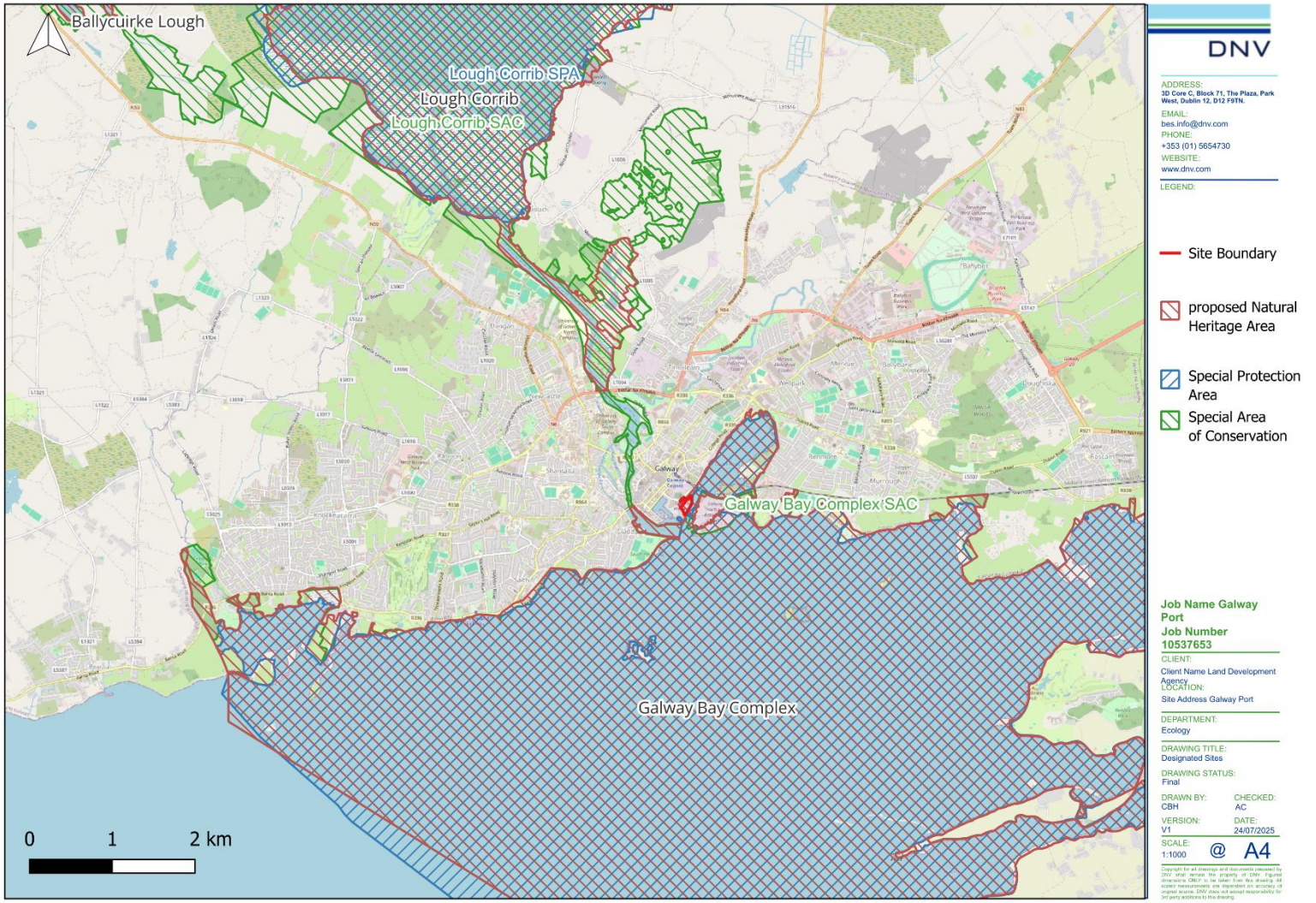



*Figure 5-4 Nationally Designated sites within the Potential Zone of Influence of the Proposed Development*

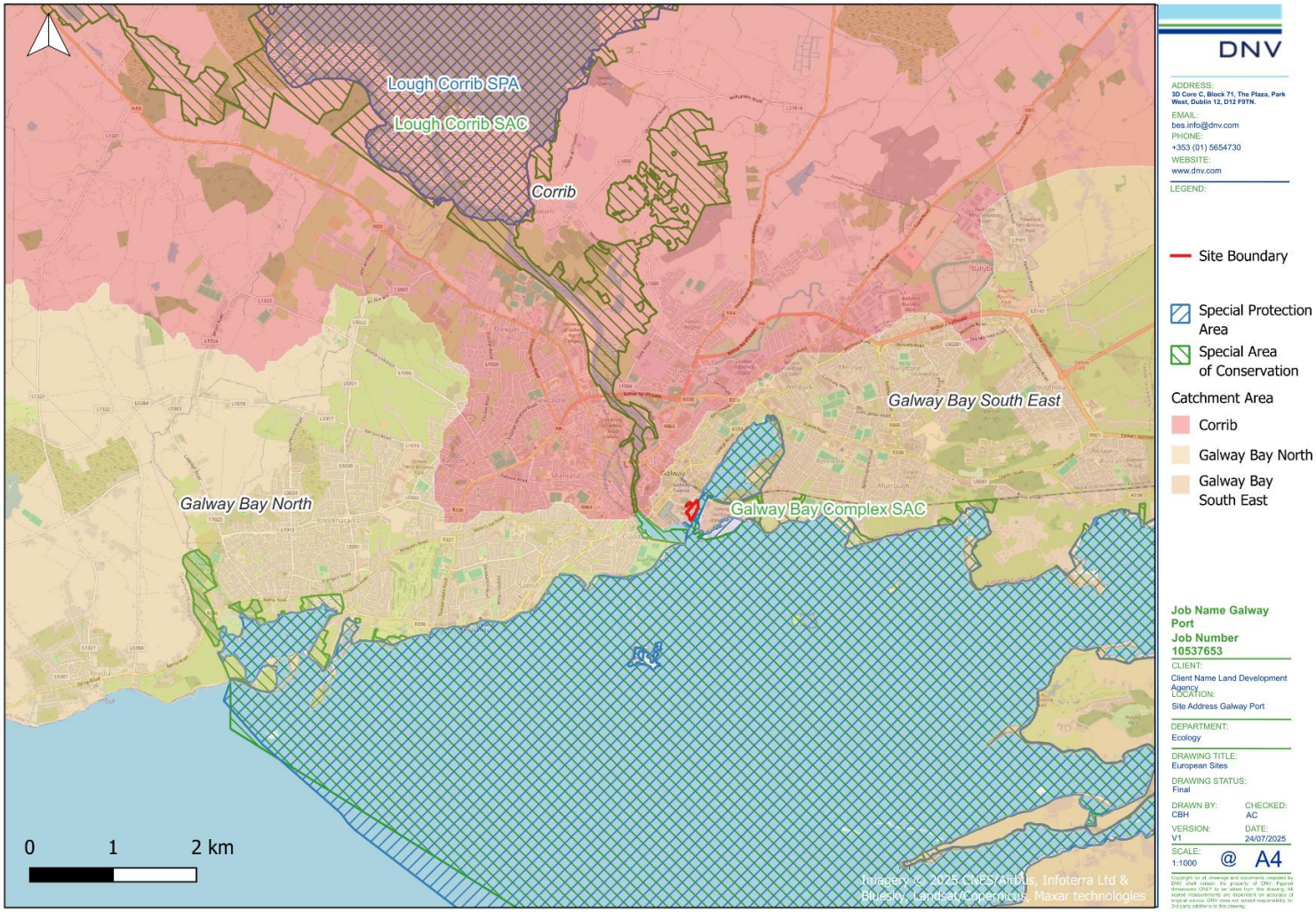



*Figure 5-5 European sites within the Vicinity of the Proposed Development (Assessed in full in the accompanying AA Screening / NIS)*

### 5.3.3 Habitats

The habitats present within the site, as recorded during the field survey, are described in this section, and summarised below. site photographs of these habitats are included in Appendix 5-3 of this EIAR, and maps of the habitats present on site and within the vicinity of the site are presented Figure 5-6 and Figure 5-7, below.

The site is a heavily modified and anthropogenically influenced area, primarily consisting of buildings and artificial surfaces (classified as BL3 – Buildings and Artificial Surfaces), dominated by hardstanding area, with few buildings present on site. Currently, the site is used for storage purposes, a detailed description of current land use is provided in Chapter 2 (Description of the Proposed Development). This land cover type is widely recognized as offering negligible ecological value due to their impermeable nature, lack of soil structure, and absence of natural vegetation. The dominance of hardstanding and built infrastructure across the site significantly limits opportunities for colonization by native flora and fauna.

A small, low-quality patch of dry meadows and grassy verge (GS2) is present along the northeast, northwest, and northern boundaries of the site. However, this habitat is fragmented, species-poor, and lacks structural diversity. It appears to be the result of incidental colonization rather than intentional ecological management, and it does not support any notable plant species or communities of conservation interest. No trees, shrubs, or flowering plants of ecological significance were recorded during the site survey, further underscoring the limited biodiversity value of the area.

Within the footprint of the Proposed Development, vegetation is virtually absent, with the exception of the aforementioned GS2 habitat. The lack of vegetative cover is indicative of made ground conditions, where soil profiles are often disturbed, compacted, or replaced with construction fill, rendering them unsuitable for the establishment of diverse or native plant communities.

Importantly, no invasive alien plant species were identified on the site, with the sole exception of a single stand of sycamore (*Acer pseudoplatanus*) located in the northeast section (outside of the red line boundary). While sycamore is not listed as a high-risk invasive species in Ireland, its presence is consistent with disturbed or unmanaged urban environments.

In summary, the site is characterized by artificial surfaces, disturbed ground, and low-quality, species-poor vegetation. These features collectively indicate that the site is of low ecological value and is representative of made ground with limited potential for supporting biodiversity. As a result, habitats on site are considered to be of Less than Local Importance.

#### *5.3.3.1 Buildings and Artificial Surfaces (BL3)*

The site is a heavily modified and anthropogenically influenced area, primarily consisting of buildings and artificial surfaces (classified as BL3 - Buildings and Artificial Surfaces), dominated by hardstanding area, with few buildings present on site. Currently the site is used for storage purposes, a detailed description of current land use is provided in Chapter 2 (Description of the Proposed Development). These land cover types are widely recognized as offering negligible ecological value due to their impermeable nature, lack of soil structure, and absence of natural vegetation. The dominance of hardstanding and built infrastructure across the site significantly limits opportunities for colonization by native flora and fauna. This habitat has been assessed as being of ‘Less than local importance’.

#### *5.3.3.2 Dry Meadows & Grassy Verges (GS2)*

A small, low-quality patch of dry meadows and grassy verge (GS2) is present along the northeast, northwest, and northern boundaries of the site. However, this habitat is fragmented, species-poor, and lacks structural diversity. It appears to be the result of incidental colonization rather than intentional ecological management, and it does not support any notable plant species or communities of conservation interest. No trees, shrubs, or flowering plants of ecological significance were recorded during the site survey, further underscoring the limited biodiversity value of the area. This habitat has been assessed as being of 'Local Importance – Lower Value'.

#### *5.3.3.3 Adjacent Habitats: Galway Bay Complex*

The site is immediately adjacent to the water connecting Lough Atalia to Galway Bay. These are important marine habitats and fall with designated European sites and can provide habitats for a wide range of species.

Galway Bay hosts a rich mosaic of marine and coastal habitats, many of which are protected under Irish and European conservation designations. Key habitats include reefs, kelp forests, sea caves, intertidal mudflats and sandflats, coastal lagoons, saltmarshes, and vegetated sea cliffs. The bay supports a wide range of biodiversity, including common seals, otters, and numerous seabird species, and is home to several Special Areas of Conservation (SACs), such as the Galway Bay Complex, Inishmore, and the Blackhead-Poulsallagh Complex.

Lough Atalia is a 50-hectare estuarine lagoon located on the eastern edge of Galway City. It is a tidal waterbody with a shallow sill at its inlet, meaning that around 80% of its area remains submerged even at low tide. The lagoon features soft, anoxic mudflats, with limited vegetation due to pollution, though some areas support algae such as *Chaetomorpha linum* and Enteromorpha species. Despite its degraded condition, Lough Atalia is ecologically significant for wintering waterbirds like Gadwall, Teal, Wigeon, and Shelduck, and is also known for sightings of otters and breeding Common Terns in summer. It forms part of the Galway Bay Complex SAC and is a valuable urban wildlife site.

As such Lough Atalia and Galway Bay are considered as being of 'International/National importance.

While there is some overlap on the mapped boundary for Galway Bay SAC and 1130 estuaries (Annex I) habitat (Figure 5-7), this is considered a digitisation[56] error as there is no actual overlap in the real world as the site comprises built land. Therefore, there are no Qualifying Interest (QI) habitats associated with the Galway Bay Complex SAC (or Lough Corrib SAC which lies 5km north) or 1130 estuaries habitat, present within the site boundaries. This

[5] Special Area of Conservation (SAC) boundaries provided by the National Parks and Wildlife Service (NPWS) are currently presented in the Irish Transverse Mercator (ITM) projection. Most boundaries were originally digitised from Ordnance Survey of Ireland 1:10,560 six-inch raster mapping in the Irish Grid projection. While suitable for general planning and assessment, these legacy boundaries may contain minor inaccuracies such as gaps, overlaps, or misalignments, particularly near county borders. NPWS is actively updating SAC boundaries using modern 1:5,000 OSI vector mapping in ITM. These revised boundaries will be formalised through Statutory Instruments (SIs) as they are completed. Over time, the dataset will increasingly reflect this improved spatial accuracy.

[6] National Parks and Wildlife Service (NPWS). Download Boundary Data – Designated Site Data.
Available at: https://www.npws.ie/maps-and-data/designated-site-data/download-boundary-data

confirms that the site does not support any habitats of European conservation importance and is not functionally connected to these designated European sites.




*Figure 5-6 Habitat Map*

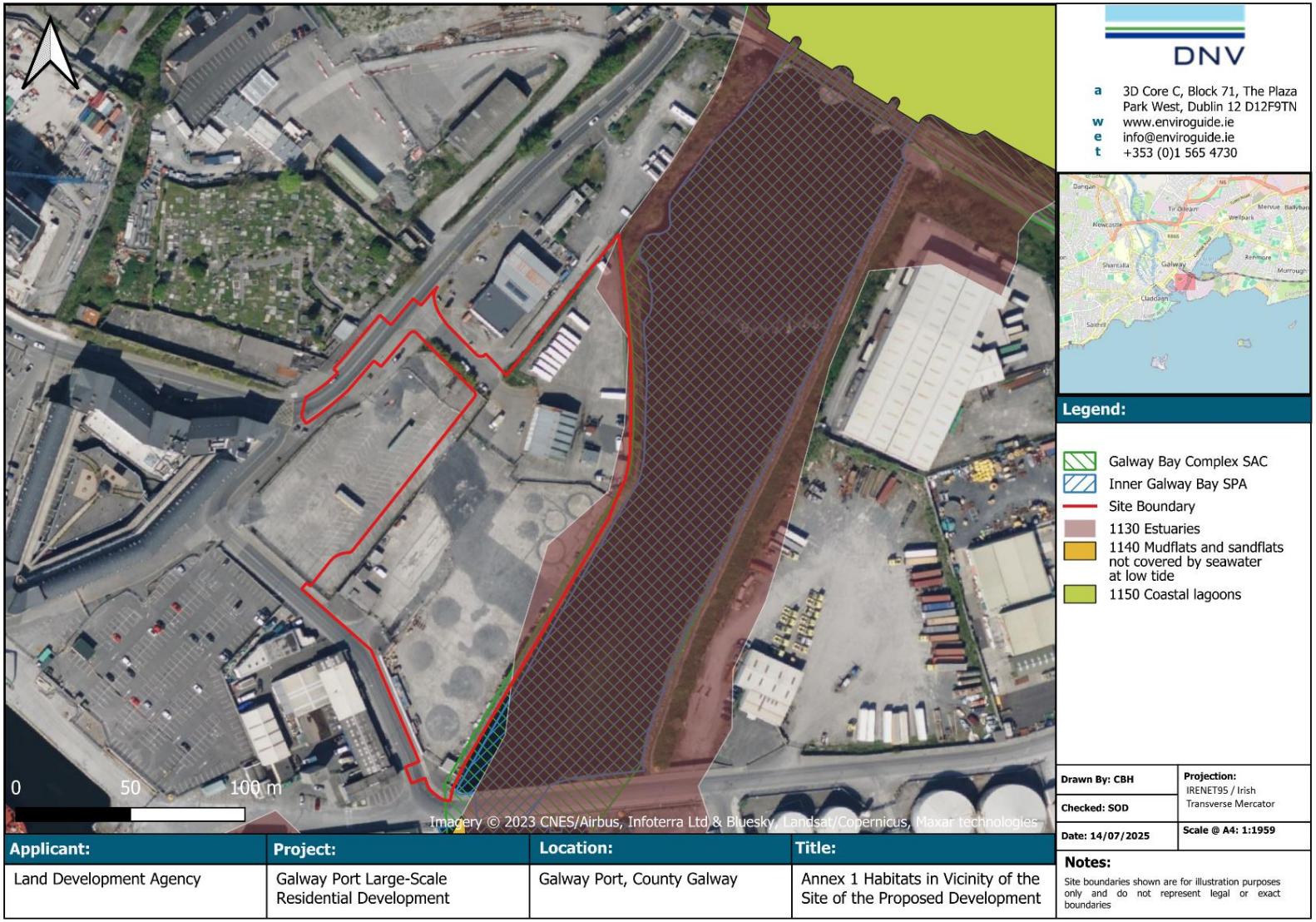



*Figure 5-7 Annex 1 Habitats in Vicinity of the Proposed Development (QGIS, 2025)*

### 5.3.4 Species and Species Groups

It should be noted here that, although the site itself is of low ecological value for flora and fauna, its proximity to ecologically sensitive areas, namely Galway Bay, Lough Atalia, and Lough Corrib, necessitates the application of the precautionary principle, and thus a higher value assignment for most species groups, in the interest of carrying out a robust assessment of the project on ecological features extant within the site, and it's immediate surrounds, which it is connected to, and could ultimately potentially impact.

#### *5.3.4.1 Flora*

##### *5.3.4.1.1 Rare and Protected Flora*

The site of the Proposed Development is located within the Ordnance Survey 2km grid square M32C and immediately adjacent to M22X. Species records from the NBDC online database show these grid squares were studied for the presence of rare and/or protected species within the last 20 years.

No protected flora from the last 20 years have been recorded within the grid squares, and 4 regionally threatened or vulnerable plant species occurred within the 2km Grid squares (Table 5-6The FPO Bryophytes database was also checked for rare and protected flora records within the vicinity of the Proposed Development from the last 20 years.

*Table 5-6 Records of rare or protected flora for the relevant 2km grid squares (M32C, M22X) associated with the Site (NBDC)*

| Name | Grid square(s) | Date of last record | Database | Designation |
|---|---|---|---|---|
| **Greater Knapweed** (*Centaurea scabiosa*) | M32C | 31/12/2010 | BSBI tetrad data for Ireland | Threatened Species: Near threatened |
| **Green Field-speedwell** (*Veronica agrestis*) | M22X | 01/05/2014 | Ireland's BioBlitz | Threatened Species: Near threatened |
| **Slender Tufted-sedge** (*Carex acuta*) | M22X | 01/05/2014 | Ireland's BioBlitz | Threatened Species: Near threatened |
| **Strawberry-tree** (*Arbutus unedo*) | M22X | 01/05/2014 | Ireland's BioBlitz | Threatened Species: Near threatened |

##### *5.3.4.1.2 Invasive Flora*

There are records for 15 species of flora in the last 20 years considered to be invasive within the grid square which encompass the site of the Proposed Development. Details of these records are listed in Table 5-7.

*Table 5-7 Records of Invasive Flora for the Surrounding 2km grid Squares Associated with the Site from the NBDC*

| Species | Grid square (s) | Date of last record | Source | Designations |
|---|---|---|---|---|
| **Butterfly-bush** (*Buddleja davidii*) | M32C, M22X | 17/07/2019 | Vascular plants: Online Atlas of Vascular Plants 2012 Onwards | Medium Impact Invasive Species |
| **Japanese Knotweed** (*Fallopia japonica*) | M32C, M22X | 10/08/2017 | National Invasive Species Database | High Impact Invasive Species<br><br>Regulation S.I. 477 (Ireland) |
| **Narrow-leaved Ragwort** (*Senecio inaequidens*) | M32C | 16/08/2019 | Vascular plants: Online Atlas of Vascular Plants 2012 Onwards | Medium Impact Invasive Species |
| **Sycamore** (*Acer pseudoplatanus*) | M32C | 17/07/2019 | Vascular plants: Online Atlas of Vascular Plants 2012 Onwards | Medium Impact Invasive Species |
| **Three-cornered Garlic** (*Allium triquetrum*) | M32C, M22X | 18/04/2021 | Vascular plants: Online Atlas of Vascular Plants 2012 Onwards | Medium Impact Invasive Species<br><br>Regulation S.I. 477 (Ireland) |
| **Wild Parsnip** (*Pastinaca sativa*) | M32C | 16/08/2019 | Vascular plants: Online Atlas of Vascular Plants 2012 Onwards | Medium Impact Invasive Species |
| **Canadian Waterweed** (*Elodea canadensis*) | M22X | 26/08/2017 | Vascular plants: Online Atlas of Vascular Plants 2012 Onwards | High Impact Invasive Species<br><br>Regulation S.I. 477 (Ireland) |
| **Cherry Laurel** (*Prunus laurocerasus*) | M22X | 25/10/2024 | National Invasive Species Database | High Impact Invasive Species |
| **Common Broomrape** (*Orobanche minor*) | M22X | 21/06/2017 | Vascular plants: Online Atlas of Vascular Plants 2012 Onwards | Medium Impact Invasive Species |

| Species | Grid square (s) | Date of last record | Source | Designations |
|---|---|---|---|---|
| **Evergreen Oak** (*Quercus ilex*) | M22X | 12/05/2020 | Vascular plants: Online Atlas of Vascular Plants 2012 Onwards | Medium Impact Invasive Species |
| **Giant Rhubarb** (*Gunnera tinctoria*) | M22X | 30/11/2009 | National Invasive Species Database | High Impact Invasive Species<br><br>Regulation S.I. 477 (Ireland) |
| **Sycamore** (*Acer pseudoplatanus*) | M22X | 15/07/2022 | Vascular plants: Online Atlas of Vascular Plants 2012 Onwards | Medium Impact Invasive Species |

#### *5.3.4.1.3 Field Study Results*

No invasive alien plant species were identified on the site, with the sole exception of a single stand of sycamore located in the northeast section, just outside the red line boundary. While sycamore is not listed as a high-risk invasive species in Ireland, its presence is consistent with disturbed or unmanaged urban environments and is generally considered not to contribute positively to the ecological value of the site.

However, it is noted that sycamore is traditionally considered to be an invasive species due to its ability to outcompete native tree species and its supposedly low contribution to local biodiversity by supporting fewer insect species than native tree species (Leslie, 2005). However, sycamore's invasiveness is considered to be more of an issue in some sensitive native woodland settings and not in urban, anthropogenic environments such as the site in question. Sycamore has also been found to support relatively high numbers of lichen species, including rarer species, when compared to native tree species (Leslie, 2005). Sycamore is therefore not considered to be a negative presence at this site and in fact provides suitable nesting and foraging habitat for local birds and invertebrate species and thus can be viewed as being positive for biodiversity in the context of the urban location of the site. Given the low quantity of sycamore present, and the lack of established woodland in the vicinity of the site, the invasive species on site are considered to be of 'Local Importance (Lower Value)'.

Additionally, no rare and/or protected bryophyte records exist within the immediate vicinity of the Proposed Development. The nearest protected bryophyte record is of *Bryum salinum*, which is located approximately 5.5km east of the site.

In summary, the site is characterized by artificial surfaces, disturbed ground, and low-quality, species-poor vegetation. Furthermore, there are no Qualifying Interest (QI) habitats associated with the Galway Bay Complex SAC or Lough Corrib SAC present within the site boundaries. This confirms that the site does not support any habitats of European conservation importance and is not functionally connected to these designated European

sites. These features collectively indicate that the site is of low ecological value and is representative of made ground with limited potential for supporting biodiversity.

#### *5.3.4.2 Bats*

##### *5.3.4.2.1 Desk Study Results*

A total of seven bat species have been recorded within the 10km grid square within which the site is located, presented below in Table 5-8.

*Table 5-8 Records of bats for the Surrounding 10km Grid Square Associated with the Site from the NBDC*

| Species | Grid square(s) | Date of last record | Database | Designation |
|---|---|---|---|---|
| **Brown Long-eared Bat** (*Plecotus auritus*) | M32C | 22/08/2018 | National Bat Database of Ireland | Protected Species: EU Habitats Directive<br><br>Protected Species: EU Habitats Directive (Annex IV)<br><br>Protected Species: Wildlife Acts |
| **Common Pipistrelle** (*Pipistrellus pipistrellus*) | M32C, M22X | 18/09/2020, 21/05/2016 | National Bat Database of Ireland | |
| **Lesser Noctule** (*Nyctalus leisleri*) | M32C, M22X | 09/10/2015, 20/09/2022 | National Bat Database of Ireland | |
| **Nauthusius's Pippistrelle** (*Pipistrellus athusii*) | M32C | 20/08/2018 | National Bat Database of Ireland | |
| **Soprano Pipistrelle** (*Pipistrellus pygmaeus*) | M32C, M22X | 18/09/2020, 20/09/2022 | National Bat Database of Ireland | |
| **Daubenton's Bat** (*Myotis daubentonii*) | M32C, M22X | 09/10/2015, 04/08/2021 | National Bat Database of Ireland | |

The suitability index for specific bat species is presented in Table 5-9. The landscape suitability index is high for three bat species listed below, medium-high for two species, medium for three species and low for one species. The Proposed Development site (Figure 5-8) is located in an area with an overall Medium-High (29.44) suitability for bats in general.

*Table 5-9 Landscape Suitability Index for individual bat species (source: NBDC). Those Species that have been Recorded in the NDBC Database within the S90 10km grid square are Highlighted in Green*

| Bat Species | Suitability Index (10km Grid Square) |
|---|---|
| **Soprano pipistrelle** *(Pipistrellus pygmaeus)* | 49 (High) |
| **Brown Longed-eared bat** *(Plecotus auritus)* | 36 (Medium - High) |

| Bat Species | Suitability Index (10km Grid Square) |
|---|---|
| **Common pipistrelle** *(Pipistrellus pipistrellus)* | 40 (High) |
| **Lesser horseshoe bat** *(Rhinolophus hipposideros)* | 0 (Low) |
| **Leisler's bat** *(Nyctalus leisleri)* | 41 (High) |
| **Whiskered bat** *(Myotis mystacinus)* | 22 (Medium) |
| **Daubenton's bat** *(Myotis daubentonii)* | 24 (Medium) |
| **Nathusius' pipistrelle** (*Pipistrellus nathusii*) | 24 (Medium) |
| **Natterer's bat** *(Myotis nattereri)* | 29 (Medium - High) |

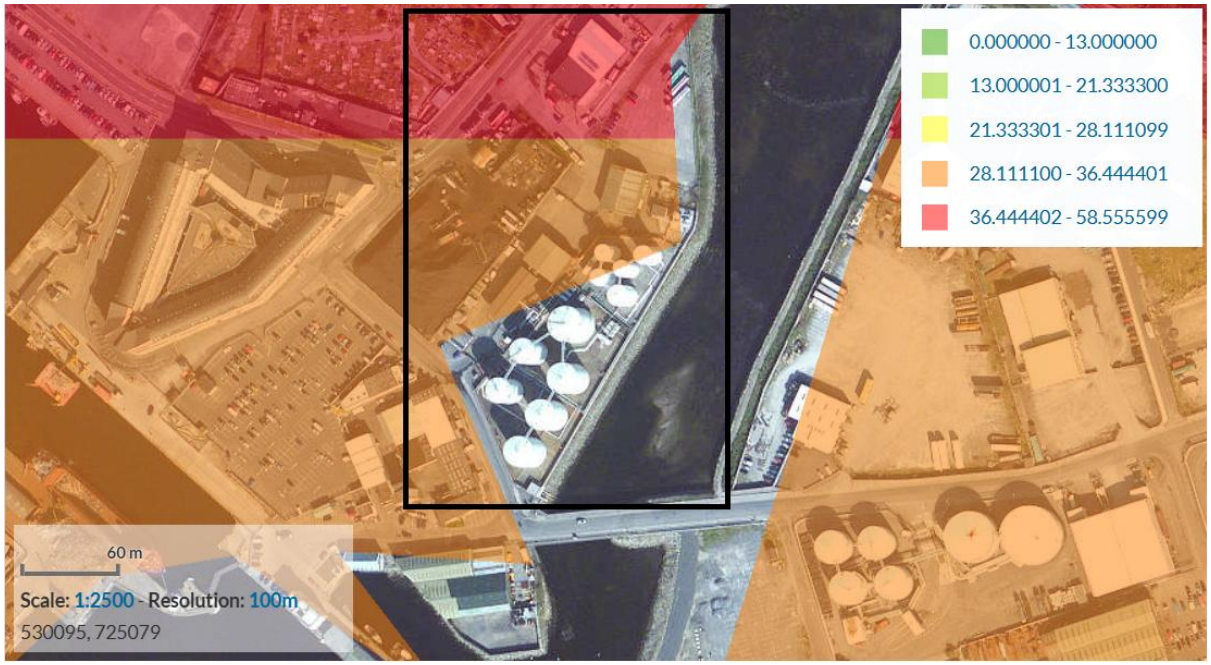



*Figure 5-8 Bat Landscape Suitability Model (all bats) surrounding the Proposed Development Site (adapted from NBDC)*

#### *5.3.4.2.2 Field Study Results*

##### *5.3.4.2.2.1 Daytime Bat Roost Assessment*

A preliminary bat roost and habitat suitability assessment survey was undertaken on the 2nd of May 2024 to evaluate the potential of on-site features to support roosting, commuting, or foraging bats. The assessment included a visual inspection of the buildings present on site, which currently include a 2-storey office-type building at the site's northern extent (used by a bus company), a single-storey building to the southwest (understood to be a substation) and a pumphouse to the south (adjacent to the bridge traversing the Lough Atalia outlet)., as well as any trees or vegetative features that could offer suitable roosting or navigational opportunities. The buildings were found to have 'Negligible' potential to support roosting bats, defined as "*negligible presence of suitable roosting features*" (Collins, 2023), due to the absence of suitable access points such as cracks, crevices, or voids typically used by bats for shelter. The structures were considered relatively modern, well-sealed, and lacking features such as soffits, loose roof tiles, or exposed beams that might otherwise provide roosting opportunities. As such, further surveys on the buildings were not required, per best practice guidance.

#### *5.3.4.2.2.2 Preliminary Habitat Suitability Assessment*

In addition to the above, the site was found to be devoid of linear landscape features such as hedgerows, treelines, or watercourses, which are commonly used by bats for commuting and foraging. The absence of these features significantly reduces the likelihood of the site being used as flight corridor or feeding ground. Furthermore, in the absence of suitable roosting structures such as mature trees, buildings with crevices, or underground features, the likelihood of the site supporting bat roosts is considered low. The limited and fragmented vegetation present on site is species-poor and lacks the floral diversity necessary to support insect populations that form the primary food source for most bat species. As such, the site offers negligible suitability for bats in terms of both roosting and foraging potential. However, owing to the proximity of the site to Galway Bay and Lough Atalia, the site was precautionarily given a higher suitability rating of 'Low', defined as "*there are some suitable but isolated commuting and foraging features*" (Collins, 2023).

#### *5.3.4.2.2.3 Bat Activity Transect Surveys*

A bat transect survey was completed on the 4th of June 2025. The survey followed standard methodology, including timed transects and the use of bat detectors to record echolocation calls as described in Section 5.2.3.2.2, above. The results showed that no bat activity was recorded during the survey period, and no individuals were observed or detected acoustically.

The absence of bat records is likely attributable to the limited habitat suitability within the site/survey area. As previously mentioned, the site is dominated by built infrastructure, with minimal green space, a lack of mature trees/hedgerows, and no significant waterbodies present within the site itself, all of which are key features that typically support foraging and commuting bats. Furthermore, the site is ecologically isolated and does not function as a corridor for mammal movement, owing to the surrounding urban environment of Galway City that borders much of the site.

Additionally, high levels of artificial lighting, noise pollution, and human disturbance associated with the Galway City urban environment which makes up the wider surrounds may further deter/reduce bat activity and/or presence. These factors collectively suggest that the site offers low ecological value for bats and is unlikely to support significant bat populations or serve as a commuting corridor.

However, accounting for the proximity of the site to Galway Bay and estuary, where bat species could commute/forage along the shoreline, particularly in the presence of scrub vegetation which would support prey invertebrate, the site is considered to be of Local Importance (Higher Value) for bats.

### *5.3.4.3 Birds*

#### *5.3.4.3.1 Desk Study Results*

A total of 141 bird species have been recorded within the M22X and M32C 2km grid squares. Of these, 51 are amber listed birds and 20 are red listed birds as identified on the Birds of Conservational Concern in Ireland (BoCCI) (Gilbert et al. 2021). These results are consistent with the geographical nature of the site which is bound by Galway Bay and Lough Atalia.

Details of all amber and red listed species recorded are detailed in Table 5-10. The remaining species are all green listed[7].

*Table 5-10 Details of Amber and Red Listed Species within the 2km grid squares Encompassing the Site (NBDC)*

| Species | Date of record | BoCCI Status |
|---|---|---|
| **Arctic Tern** (*Sterna paradisaea*) | 07/07/2016 | Amber |
| **Barn Swallow** (*Hirundo rustica*) | 02/07/2017 | Amber |
| **Bar-tailed Godwit** (*Limosa lapponica*) | 07/03/2020 | Amber |
| **Black Guillemot** (*Cepphus grylle*) | 05/02/2005 | Amber |
| **Black-tailed Godwit** (*Limosa limosa*) | 31/12/2011 | Amber |
| **Brent Goose** (*Branta bernicla*) | 07/03/2020 | Amber |
| **Common Coot** (*Fulica atra*) | 31/12/2011 | Amber |
| **Common Guillemot** (*Uria aalge*) | 31/12/2011 | Amber |
| **Common Kestrel** (*Falco tinnunculus*) | 22/08/2016 | Amber |
| **Common Kingfisher** (*Alcedo atthis*) | 31/12/2011 | Amber |
| **Common Linnet** (*Carduelis cannabina*) | 15/04/2023 | Amber |
| **Common Sandpiper** (*Actitis hypoleucos*) | 31/12/2011 | Amber |
| **Common Shelduck** (*Tadorna tadorna*) | 15/04/2023 | Amber |
| **Common Snipe** (*Gallinago gallinago*) | 17/01/2023 | Amber |
| **Common Starling** (*Sturnus vulgaris*) | 30/04/2023 | Amber |
| **Common Swift** (*Apus apus*) | 08/07/2022 | Amber |
| **Common Tern** (*Sterna hirundo*) | 19/05/2019 | Amber |
| **Eurasian Oystercatcher** (*Haematopus ostralegus*) | 15/04/2023 | Amber |

[7] And therefore excluded from the above table.

| Species | Date of record | BoCCI Status |
|---|---|---|
| **Eurasian Sparrowhawk** (*Accipiter nisus*) | 23/07/2014 | Amber |
| **Eurasian Teal** (*Anas crecca*) | 03/12/2022 | Amber |
| **European Greenfinch** (*Carduelis chloris*) | 09/07/2017 | Amber |
| **European Robin** (*Erithacus rubecula*) | 10/09/2012 | Amber |
| **European Shag** (*Phalacrocorax aristotelis*) | 07/03/2020 | Amber |
| **Gadwall** (*Anas strepera*) | 15/04/2023 | Amber |
| **Goldcrest** (*Regulus regulus*) | 31/12/2011 | Amber |
| **Great Black-backed Gull** (*Larus marinus*) | 12/09/2012 | Amber |
| **Great Cormorant** (*Phalacrocorax carbo*) | 11/10/2022 | Amber |
| **Great Crested Grebe** (*Podiceps cristatus*) | 31/12/2011 | Amber |
| **Great Northern Diver** (*Gavia immer*) | 11/03/2020 | Amber |
| **Great Spotted Woodpecker** (*Dendrocopos major*) | 11/12/1988 | Amber |
| **Greater Scaup** (*Aythya marila*) | 31/12/2011 | Amber |
| **Hen Harrier** (*Circus cyaneus*) | 20/10/2021 | Amber |
| **House Martin** (*Delichon urbicum*) | 12/09/2012 | Amber |
| **House Sparrow** (*Passer domesticus*) | 19/01/2023 | Amber |
| **Lesser Black-backed Gull** (*Larus fuscus*) | 31/12/2011 | Amber |
| **Little Grebe** (*Tachybaptus ruficollis*) | 03/12/2022 | Amber |
| **Little Gull** (*Larus minutus*) | 31/12/2011 | Amber |
| **Mediterranean Gull** (*Larus melanocephalus*) | 05/02/2005 | Amber |
| **Mew Gull** (*Larus canus*) | 07/03/2020 | Amber |

| Species | Date of record | BoCCI Status |
|---|---|---|
| **Mistle Thrush** (*Turdus viscivorus*) | 21/02/2015 | Amber |
| **Mute Swan** (*Cygnus olor*) | 06/02/2023 | Amber |
| **Northern Gannet** (*Morus bassanus*) | 31/12/2011 | Amber |
| **Northern Wheatear** (*Oenanthe oenanthe*) | 15/10/2018 | Amber |
| **Razorbill** (*Alca torda*) | 31/12/2011 | Amber |
| **Red Knot** (*Calidris canutus*) | 31/12/2011 | Amber |
| **Red-throated Diver** (*Gavia stellata*) | 31/12/2011 | Amber |
| **Sand Martin** (*Riparia riparia*) | 13/04/2023 | Amber |
| **Sandwich Tern** (*Sterna sandvicensis*) | 19/05/2019 | Amber |
| **Sky Lark** (*Alauda arvensis*) | 31/12/2011 | Amber |
| **Stonechat** (*Saxicola torquata*) | 10/12/2017 | Amber |
| **Whooper Swan** (*Cygnus cygnus*) | 31/12/2011 | Amber |
| **Balearic Shearwater** (*Puffinus mauretanicus*) | 18/04/2018 | Red |
| **Barn Owl** (*Tyto alba*) | 10/12/2022 | Red |
| **Black-headed Gull** (*Larus ridibundus*) | 11/03/2020 | Red |
| **Common Goldeneye** (*Bucephala clangula*) | 31/12/2011 | Red |
| **Common Pochard** (*Aythya ferina*) | 11/03/2020 | Red |
| **Common Redshank** (*Tringa totanus*) | 11/03/2020 | Red |
| **Common Scoter** (*Melanitta nigra*) | 31/12/2011 | Red |
| **Corn Crake** (*Crex crex*) | 31/05/2023 | Red |
| **Dunlin** (*Calidris alpina*) | 12/01/2013 | Red |

| Species | Date of record | BoCCI Status |
|---|---|---|
| **Eurasian Curlew** (*Numenius arquata*) | 16/02/2021 | **Red** |
| **Eurasian Wigeon** (*Anas penelope*) | 15/04/2023 | **Red** |
| **Eurasian Woodcock** (*Scolopax rusticola*) | 25/05/2023 | **Red** |
| **European Golden Plover** (*Pluvialis apricaria*) | 24/02/2017 | **Red** |
| **Grey Wagtail** (*Motacilla cinerea*) | 12/09/2012 | **Red** |
| **Herring Gull** (*Larus argentatus*) | 19/01/2022 | **Red** |
| **Long-tailed Duck** (*Clangula hyemalis*) | 31/12/2011 | **Red** |
| **Meadow Pipit** (*Anthus pratensis*) | 31/12/2011 | **Red** |
| **Northern Lapwing** (*Vanellus vanellus*) | 03/12/2022 | **Red** |
| **Tufted Duck** (*Aythya fuligula*) | 10/09/2012 | **Red** |
| **Twite** (*Carduelis flavirostris*) | 09/09/2012 | **Red** |

#### *5.3.4.3.2 Field Study Results*

##### *5.3.4.3.2.1 Preliminary Bird Survey Results*

A walkover survey was conducted on 2nd of May 2024 to record bird species present on site. During the survey, a total of seven bird species were observed, as detailed in Table 5-11. These included five species listed as Amber, and two species listed as Green under the Birds of Conservation Concern in Ireland (BoCCI) 2021 assessment (Gilbert et al., 2021). The presence of an Amber-listed species, such as Herring Gull (*Larus argentatus*), is notable, as this species has experienced significant population declines in recent decades, primarily due to changes in food availability and breeding habitat loss. Other Amber-listed species recorded include the Common Tern (*Sterna hirundo*), Cormorant (*Phalacrocorax carbo*), Lesser Black-backed Gull (*Larus fuscus*), and Mute Swan (*Cygnus olor*), all of which are considered to be of moderate conservation concern due to factors such as restricted breeding ranges, localized declines, or dependence on vulnerable habitats.

The remaining two species; Goldfinch (*Carduelis carduelis*) and Rock Pipit (*Anthus petrosus),* are Green-listed, indicating stable populations with no immediate conservation concerns.

Overall, the bird assemblage recorded reflects the site's proximity to coastal and urban environments, with several species likely using adjacent aquatic habitats for foraging or roosting.

However, the site itself offers very limited nesting or foraging opportunities due to the heavily modified nature of the site which has resulted in the dominance of artificial surfaces and a distinct absence of diverse vegetation or structural habitat features.

While the presence of species of conservation concern highlights the ecological value of the surrounding area, the site's contribution to avian biodiversity is considered low. This initial walkover survey informed the need for additional targeted breeding and wintering bird surveys at the site, discussed in more detail in the subsequent sections.

*Table 5-11 Bird Species Recorded During Walkover Survey on the 2nd of May 2024*

| Species | BoCCI Status |
|---|---|
| **Herring Gull** (*Larus argentatus*) | Amber |
| **Common Tern** (*Sterna hirundo*) | Amber |
| **Cormorant** (*Phalacrocorax carbo*) | Amber |
| **Lesser Black-backed Gull** (*Larus fuscus*) | Amber |
| **Mute Swan** (*Cygnus olor*) | Amber |
| **Goldfinch** (*Carduelis carduelis*) | Green |
| **Rock Pipit** (*Anthus petrosus*) | Green |

#### *5.3.4.3.2.2 Wintering Bird Surveys*

A total of 12 winter bird surveys have been conducted at the site between October 2024 and March 2025. A total of 37 species of bird were observed flying over or in proximity to the site. The species and their conservation status (BoCCI) are described in Table 5-12. Overall, the bird assemblage recorded reflects the site's proximity to coastal and urban environments, with several species likely using adjacent aquatic habitats for foraging or roosting. As a result, despite the site's low habitat suitability to support bird species, the site has been assigned as 'Local Importance – Higher Value' for wintering bird species. The conditions and dates for each survey are described in Table 5-3 above.

*Table 5-12 Birds Recorded at the Proposed Development Site During Wintering Bird Surveys*

| Species | Scientific name | BoCCI Status | Dates recorded | Activity |
|---|---|---|---|---|
| Cormorant | *Phalacrocorax carbo* | Amber | 31st October 2024<br>12th November 2024<br>25th November 2024<br>5th March 2025<br>21st March 2025 | Flyover at the site and seen in Lough Atalia. |
| Mallard | *Anas platyrhynchos* | Amber | 31st October 2024 | Flyover at the site and seen in Lough Atalia. |

| Species | Scientific name | BoCCI Status | Dates recorded | Activity |
|---|---|---|---|---|
| | | | 25th November 2024<br>20th January 2025<br>19th February 2025 | |
| European Herring Gull | *Larus argentatus* | Amber | 31st October 2024<br>12th November 2024<br>25th November 2024<br>16th December 2024<br>6th January 2025<br>20th January 2025<br>19th February 2025<br>28th February 2025<br>5th March 2025<br>21st March 2025<br>31st March 2025 | Regular flyover at the site and seen in Lough Atalia. |
| Linnet | *Linaria cannabina* | Amber | 31st October 2024 | Seen in the vicinity of the site |
| Kingfisher | *Alcedo atthis* | Amber | 31st October 2024<br>12th November 2024<br>25th November 2024<br>16th December 2024<br>6th January 2025<br>20th January 2025<br>4th February 2025<br>19th February 2025 | Regularly seen in the vicinity of the site, along adjacent water channel and in Lough Atalia. |
| Mute Swan | *Cygnus olor* | Amber | 31st October 2024<br>12th November 2024<br>25th November 2024<br>16th December 2024<br>28th February 2025<br>5th March 2025<br>31st March 2025 | Regularly seen in the vicinity of the site, along adjacent water channel and in Lough Atalia. |
| Wigeon | *Mareca penelope* | Amber | 31st October 2024<br>12th November 2024<br>19th February 2025 | Seen in Lough Atalia. |

| Species | Scientific name | BoCCI Status | Dates recorded | Activity |
|---|---|---|---|---|
| Teal | *Anas crecca* | Amber | 31st October 2024<br>12th November 2024<br>25th November 2024<br>16th December 2024<br>19th February 2025 | Seen in Lough Atalia. |
| Greenshank | *Tringa nebularia* | Green | 31st October 2024<br>12th November 2024<br>25th November 2024<br>16th December 2024<br>19th February 2025 | Seen in Lough Atalia. |
| Great Black-backed Gull | *Larus marinus* | Amber | 31st October 2024<br>12th November 2024<br>25th November 2024<br>16th December 2024<br>20th January 2025<br>19th February 2025<br>5th March 2025<br>31st March 2025 | Regular flyover at the site and seen in Lough Atalia. |
| Curlew | *Numenius arquata* | Red | 31st October 2024 | Seen in Lough Atalia. |
| Grey Heron | *Ardea cinerea* | Green | 12th November 2024<br>25th November 2024<br>16th December 2024<br>19th February 2025<br>28th February 2025 | Seen in adjacent water channel and in Lough Atalia. |
| House Sparrow | *Passer domesticus* | Amber | 12th November 2024<br>25th November 2024 | Seen on site, in the vicinity of the site, and along adjacent water channel. |
| Starling | *Sturnus vulgaris* | Amber | 31st October 2024<br>12th November 2024<br>25th November 2024 | Seen on site, in the vicinity of the site, and along adjacent water channel. |
| Little Grebe | *Tachybaptus ruficollis* | Green | 12th November 2024<br>25th November 2024 | Seen in Lough Atalia. |
| Gadwall | *Mareca strepera* | Amber | 12th November 2024 | Seen in Lough Atalia. |

| Species | Scientific name | BoCCI Status | Dates recorded | Activity |
|---|---|---|---|---|
| | | | 25th November 2024<br>16th December 2024<br>20th January 2025<br>4th February 2025 | |
| Redshank | *Tringa totanus* | Red | 12th November 2024<br>25th November 2024<br>16th December 2024<br>6th January 2025<br>20th January 2025<br>4th February 2025<br>19th February 2025 | Flyover along adjacent water channel and seen in Lough Atalia. |
| Turnstone | *Arenaria interpes* | Amber | 12th November 2024<br>25th November 2024<br>16th December 2024<br>6th January 2025<br>4th February 2025 | Seen in Lough Atalia. |
| Lapwing | *Vanellus vanellus* | Red | 12th November 2024<br>25th November 2024<br>16th December 2024 | Seen in Lough Atalia. |
| Snipe | *Gallinago gallinago* | Red | 12th November 2024<br>25th November 2024 | Seen in Lough Atalia. |
| Common Gull | *Larus canus* | Amber | 12th November 2024<br>16th December 2024<br>6th January 2025<br>20th January 2025<br>4th February 2025<br>19th February 2025<br>28th February 2025<br>5th March 2025<br>21st March 2025 | Regular flyover at the site and seen in Lough Atalia. |
| Ringed Plover | *Charadrius hiaticula* | Amber | 12th November 2024 | Seen in Lough Atalia. |
| Black-headed Gull | *Larus ridibundus* | Amber | 31st October 2024<br>12th November 2024 | Regular flyover at the site and seen in Lough Atalia. |

| Species | Scientific name | BoCCI Status | Dates recorded | Activity |
|---|---|---|---|---|
| | | | 25th November 2024<br>16th December 2024<br>6th January 2025<br>20th January 2025<br>4th February 2025<br>19th February 2025<br>28th February 2025<br>5th March 2025<br>21st March 2025<br>31st March 2025 | |
| Little Egret | *Egretta garzetta* | Green | 25th November 2024<br>6th January 2025<br>20th January 2025 | Flyover along the adjacent water channel. |
| Shelduck | *Tadorna tadorna* | Amber | 25th November 2024<br>16th December 2024 | Seen in Lough Atalia. |
| Greenfinch | *Chloris chloris* | Amber | 25th November 2024<br>19th February 2025 | Seen on site, in the vicinity of the site, and along adjacent water channel. |
| Peregrine Falcon | *Falco peregrinus* | Green | 6th January 2025<br>4th February 2025 | Seen flying over the site. |
| Meadow Pipit | *Anthus pratensis* | Red | 20th January 2025<br>5th March 2025 | Seen using the site. |
| Stock Dove | *Columba oenas* | Red | 20th January 2025 | Flew over the site. |
| Oystercatcher | *Haematopus ostralegus* | Red | 20th January 2025<br>19th February<br>21st March 2025 | In the waters adjacent to the site. |
| Hooded Crow | *Corvus cornix* | Green | 4th February 2025 | In waters adjacent to the site. |
| Great Northern Diver | *Gavia immer* | Amber | 4th February 2025<br>28th February 2025 | Flew adjacent to the site. |
| Rock Pipit | *Anthus petrosus* | Green | 5th March 2025<br>31st March 2025 | Calling and singing in the vicinity of (but entirely outside) the site. |

| Species | Scientific name | BoCCI Status | Dates recorded | Activity |
|---|---|---|---|---|
| Guillemot | *Uria aalge* | Amber | 21st March 2025 | Recorded offshore in the vicinity of (but entirely outside) the site. |
| Shag | *Phalacrocorax aristotelis* | Amber | 21st March 2025 | Recorded offshore in the vicinity of (but entirely outside) the site. |
| Red-throated Diver | *Gavia stellata* | Amber | 21st March 2025 | Recorded offshore in the vicinity of (but entirely outside) the site. |
| Sandwich Tern | *Sterna sandvicensis* | Amber | 21st March 2025 | Recorded offshore in the vicinity of (but entirely outside) the Site. |
| Lesser Black-backed Gull | *Larus fuscus* | Amber | 31st March 2025 | Flew over the site. |

#### *5.3.4.3.2.3 Breeding Bird Surveys*

The results of the breeding bird survey carried out on the 4th of June 2025 determined that there were no signs of breeding birds using the site. Some flyovers were observed, this included common species such as Blackbird (*Turdus merula*). Several Common Tern (*Sterna hirundo*) were recorded using the estuary. This species is known to breed in Lough Atalia. Finally, Kingfisher (*Alcedo atthis*) was observed flying along the estuary also.

It should be noted that Kingfisher was recorded at every winter bird survey carried out for this site also. Nesting preferences for this species are typically near slow-moving or still freshwater bodies like rivers, streams, lakes, or canals, and are located on steep, soft earth banks that are easy to dig into. Accounting for the above, it is considered that Kingfisher is breeding close by but not within or immediately adjacent to the site. While birds are not considered to be breeding on-site, owing to a lack of suitable habitat, the site is considered to be of 'Local Importance (Higher Value)' for breeding birds, owing to its proximity to Galway Bay and Lough Atalia, and the presence of small buildings on site which could provide potential nesting habitat for use by Gull species in the future (Gulls are known to nest on building roofs). All species recorded during this survey are shown below in Table 5-13, while survey conditions are provided in Table 5-2 above.

*Table 5-13 Birds Recorded at the Site During the Three breeding Bird Surveys (those shaded amber are SCI species)*

| Species | Scientific name | BoCCI Status | Dates recorded | Activity |
|---|---|---|---|---|
| Blackbird | *Turdus merula* | Green | 4th June 2025 | Possible breeder. Species observed in breeding season in suitable nesting habitat |
| Black-headed Gull | *Larus ridibundus* | Amber | 4th June 2025 | Non-breeding. Flyovers only. |

| Species | Scientific name | BoCCI Status | Dates recorded | Activity |
|---|---|---|---|---|
| Common Tern | *Sterna hirundo* | Amber | 4th June 2025 | The birds nesting on Lough Atalia were flying up and down the river and over the site carrying food from the sea back to the lake. |
| Grey Heron | *Ardea cinerea* | Green | 4th June 2025 | Non-breeder. Feeding along the river. (outside the RLB) |
| Herring Gull | *Larus argentatus* | Amber | 4th June 2025 | Possible breeder. Species observed in breeding season in suitable nesting habitat |
| Kingfisher | *Alcedo atthis* | Amber | 4th June 2025 | Almost certainly breeding along the river (outside RLB). |
| Linnet | *Linaria cannabina* | Amber | 4th June 2025 | Possible breeder. Species observed in breeding season in suitable nesting habitat |
| Mallard | *Anas platyrhynchos* | Amber | 4th June 2025 | Four on the river (outside the RLB) |
| Pied Wagtail | *Motacilla alba yarrelli* | Green | 4th June 2025 | Probable breeding. Pair observed in suitable nesting habitat in breeding season |
| Robin | *Erithacus rubecula* | Green | 4th June 2025 | Probable breeding. Pair observed in suitable nesting habitat in breeding season (in vegetation along river i.e., outside the RLB) |
| Rock Pipit | *Anthus petrosus* | Green | 4th June 2025 | Probable breeding. Pair observed in suitable nesting habitat in breeding season (along river i.e., outside the RLB) |
| Swallow | *Hirundo rustica* | Amber | 4th June 2025 | Non-breeder. Foraging over the site. |
| Wren | *Troglodytes troglodytes* | Green | 4th June 2025 | Probable breeding. Pair observed in suitable nesting habitat in breeding season (in vegetation just outside the RLB) |

#### *5.3.4.4 Mammals (excluding bats)*

##### *5.3.4.4.1 Desk Study Results*

Records for terrestrial mammals were obtained from the NBDC online database for the last 20 years. Table 5-14 lists these species, their date of last record and summarises their protected status/designation. In total, 18 terrestrial mammal species (14 native and 4 non-native or

invasive) were recorded within the grid squares which encompass the Proposed Development site.

*Table 5-14 Records of Terrestrial and Marine Mammals (native and non-native) for the M32C and M22X 2km Grid Squares Associated with the Site from the NBDC*

| Species | Grid square(s) | Date of last record | Source | Designation |
|---|---|---|---|---|
| **NATIVE SPECIES (TERRESTRIAL)** | | | | |
| **European Otter** (*Lutra lutra*) | M32C, M22X | 25/02/2017, 28/06/2017 | Mammals of Ireland 2016-2025 | Wildlife Act 1976 (as amended)<br>EU Habitats Directive – Annex II & IV |
| **Pine Marten** (*Martes martes*) | M22X | 02/05/2021 | Mammals of Ireland 2016-2015 | Wildlife Act 1976 (as amended)<br>EU Habitats Directive – Annex V |
| **Eurasian Badger** (*Meles meles*) | M32C | 24/04/2007 | Road Kill Survey | Wildlife Act 1976 (as amended) |
| **Eurasian Red Squirrel** (*Sciurus vulgaris*) | M32C, M22X | 13/04/2022, 05/09/2022 | Mammals of Ireland 2016-2025 | Wildlife Act 1976 (as amended) |
| **West European Hedgehog** *(Erinaceus europaeus)* | M32C, M22X | 24/07/2023, 03/10/2023 | Hedgehogs of Ireland | Wildlife Act 1976 (as amended) |
| **Irish Hare** (*Lepus timidus* subsp. *hibernicus*) | M32C, M22X | 07/02/2007, 21/03/2007 | Road Kill Survey, Mammals of Ireland 2016-2025 | Wildlife Act 1976 (as amended)<br>EU Habitats Directive – Annex V |
| **Red Fox** (*Vulpes vulpes*) | M32C, M22X | 15/10/2013, 19/05/2012 | Atlas of Mammals in Ireland 2010-2015, Mammals of Ireland 2016-2025 | Not legally protected |
| **Wood Mouse** (*Apodemus sylvaticus*) | M22X | 08/10/2014 | Atlas of Mammals in Ireland 2010-2015 | Not legally protected |
| **NATIVE SPECIES (MARINE)** | | | | |

| Species | Grid square(s) | Date of last record | Source | Designation |
|---|---|---|---|---|
| **Bottle-nosed Dolphin** (*Tursiops truncatus*) | M32C, M22X | 09/07/2023, 29/06/2022 | IWDG Casual Cetacean Sightings | Wildlife Act 1976 (as amended)<br>EU Habitats Directive – Annex II and IV |
| **Common Dolphin** (*Delphinus delphis*) | M32C, M22X | 08/05/2023, 14/10/2021 | IWDG Casual Cetacean Sightings,<br>IWDG Cetacean Strandings Database | Wildlife Act 1976 (as amended)<br>EU Habitats Directive – Annex IV |
| **Striped Dolphin** (*Stenella coeruleoalba*) | M32C, M22X | 27/02/2009, 24/02/2020 | IWDG Cetacean Strandings Database | Wildlife Act 1976 (as amended)<br>EU Habitats Directive – Annex IV |
| **Common Porpoise** (*Phocoena phocoena)* | M22X | 07/08/2017 | IWDG Cetacean Strandings Database | Wildlife Act 1976 (as amended)<br>EU Habitats Directive – Annex II and IV<br>Threatened Species: OSPAR Convention |
| **Common Seal** (*Phoca vitulina*) | M32C, M22X | 06/01/2024, 19/05/2020 | Explore Your Shore,<br>iNaturalist Marine Species Records for Ireland | Wildlife Act 1976 (as amended)<br>EU Habitats Directive – Annex II and V |
| **Grey Seal** (*Halichoerus grypus*) | M32C, M22X | 25/11/2023, 30/06/2017 | Explore Your Shore, Mammals of Ireland 2016-2025 | Wildlife Act 1976 (as amended)<br>EU Habitats Directive – Annex II and V |
| **NON-NATIVE AND INVASIVE SPECIES (TERRESTRIAL)** | | | | |
| **American Mink** (*Mustela vison*) | M32C, M22X | 08/09/2013, 22/07/2016 | Atlas of Mammals in Ireland 2010-2015,<br>National Invasive Species Database | High Impact Invasive Species<br>Regulation S.I. 477 (Ireland) |

| Species | Grid square(s) | Date of last record | Source | Designation |
|---|---|---|---|---|
| **Brown Rat** (*Rattus norvegicus*) | M32C | 22/11/2017 | National Invasive Species Database | High Impact Invasive Species<br>Regulation S.I. 477 (Ireland) |
| **Bank Vole** (*Myodes glareolus*) | M22X | 08/10/2014 | Atlas of Mammals in Ireland 2010-2015 | Medium Impact Invasive Species |
| **European Rabbit** (*Oryctolagus cuniculus*) | M32C, M22X | 11/11/2012, 18/05/2016 | Atlas of Mammals in Ireland 2010-2015,<br>Mammals of Ireland 2016-2025 | Medium Impact Invasive Species |

#### *5.3.4.4.2 Field Study Results*

##### *5.3.4.4.2.1 General Mammal Survey Results*

A mammal survey was conducted on 2nd of May 2024, during which no evidence of mammal activity or use of the site was recorded. The site largely lacks the ecological features necessary to support terrestrial mammals, including vegetative cover, natural soil profiles, and structural diversity. These deficiencies preclude the presence of suitable foraging, sheltering, or breeding opportunities for species such as the Badger (*Meles meles*) European Hedgehog (*Erinaceus europaeus*), Irish Stoat (*Mustela erminea hibernica*), wood mouse (*Apodemus sylvaticus*), and Pygmy Shrew (*Sorex minutus*).

As a result, the site has been assessed as being of 'Local Importance – Lower Value' for small mammal species.

However, marine species such as Otter (*Lutra lutra*) and Harbour Seal (*Phoca vitulina*) are known to use the adjacent waters. While the site itself does not provide suitable habitat for these species, and no evidence of their use of the site was observed, the precautionary principle has been applied due to its proximity to the aquatic environment. As such, the site is considered to be of 'Local Importance (Higher Value)' for Otters and marine mammals.

##### *5.3.4.4.2.2 Otter Survey Results*

The dedicated otter survey which was completed on the 4th of June 2025, found no evidence of otter holt or activity within the site or nearby shoreline. However, a single otter was observed foraging in the bay during the survey, confirming the otters presence in the area. Per the previous section, the site is considered to be of 'Local Importance (Higher Value)' for Otter.

#### *5.3.4.5 Amphibians*

##### *5.3.4.5.1 Desk Study Results*

No amphibians have been recorded in either the M32C or M22X 2km grid squares within the last 20 years.

#### *5.3.4.5.2 Field Study Results*

Amphibians require moist environments with access to standing waterbodies for breeding, but urban areas such as this, often lack ponds, wetlands, or slow-moving streams. Additionally, the heavily urbanised landscape which includes roads, buildings, and paved surfaces, within the site and wider surrounds, would further disrupt their ability to forage and commute between habitats, which is critical during seasonal migrations. The scarcity of vegetation and natural cover on site would also expose them to predators and environmental stress, while pollution and artificial lighting would serve to further degrade habitat quality. These combined factors make urban environments, such as the Proposed Development site inhospitable for sustaining healthy amphibian populations.

No amphibians were recorded during the site walkover on the 2nd of May 2024 nor was there any suitable habitat present. As such the site is considered to be of 'Less than Local Importance' for amphibians.

### *5.3.4.6 Reptiles*

#### *5.3.4.6.1 Desk Study Results*

No reptiles have been recorded in either the M32C or M22X 2km grid squares within the last 20 years.

#### *5.3.4.6.2 Field Study Results*

No reptiles were recorded on site during the May 2024 walkover survey. Common lizard (*Zootoca vivipara*) is ubiquitous across Ireland and inhabits a wide range of habitats including modified landscapes such as this. However, in heavily urbanised sites such as this, the potential for Common Lizard to occur is generally low, unless:

- There are pockets of semi-natural habitat (e.g. brownfield sites, railway embankments, overgrown gardens).
- The site includes sunny, undisturbed areas (for basking and thermoregulation) with vegetation cover and invertebrate prey.
- There is connectivity to nearby suitable habitats (e.g. green corridors, hedgerows).

While overall there is a distinct lack of these features at site of the Proposed Development, especially exposed soil, vegetation structure (for cover and invertebrate prey), and refuges, there is some suitable habitat in the form of large areas of exposed stone (for basking). As such, a precautionary approach is adopted, and it is presumed that common lizard is present at the site. The site is therefore considered to be of 'Local Importance (Lower Value)' for this species.

### *5.3.4.7 Invertebrates*

#### *5.3.4.7.1 Desk Study Results*

There are 10 species of invertebrate (including molluscs) recorded in the M32C and M22X grid squares within the last 20 years. Of these, 3 are considered invasive (Table 5-15).

*Table 5-15 Records of Invertebrates for the M32C and M22X 2km Grid Squares Associated with the Site from the NBDC*

| Species | Grid square(s) | Date of last record | Source | Designation |
|---|---|---|---|---|
| **Native Species** | | | | |
| Large Red Tailed Bumble Bee (*Bombus (Melanobombus) lapidarius)* | M32C<br>M22X | 26/08/2022<br>30/04/2023 | Bees of Ireland | Threatened Species: Near threatened |
| Moss Carder-bee (Bombus (*Thoracombus) muscorum*) | M32C<br>M22X | 25/05/2022<br>26/08/2022 | Bees of Ireland | Threatened Species: Near threatened |
| Spire Snail (*Ventrosia ventrose)* | M32C | 31/10/2016 | Irish Lagoon Surveys | Threatened Species: Vulnerable |
| Red-tailed Carder Bee (Bombus (*Thoracombus) ruderarius*) | M22X | 14/06/2019 | Bees of Ireland | Threatened Species: Vulnerable |
| Common Oyster (*Ostrea edulis*) | M22X | 16/08/2022 | Explore Your Shore | Threatened Species: OSPAR Convention |
| Dog Whelk (*Nucella lapillus*) | M22X | 16/03/2024 | Explore Your Shore | Threatened Species: OSPAR Convention |
| Ear Pond Snail (*Radix auricularia*) | M22X | 02/05/2014 | Ireland's BioBlitz | Threatened Species: Vulnerable |
| **Invasive Species** | | | | |
| Portuguese Oyster (*Crassostrea gigas*) | M22X | 05/08/2023 | Explore Your Shore | High Impact Invasive Species |
| Zebra Mussel (*Dreissena (Dreissena) polymorpha*) | M22X | 21/06/2018 | A national macroinvertebrate dataset collected for the biomonitoring of Ireland's river network, 2007–2018 (EPA) | High Impact Invasive Species, Regulation S.I. 477 (Ireland) |
| Budapest Slug (*Tandonia budapestensis*) | M22X | 02/05/2014 | Ireland's BioBlitz | Medium Impact Invasive Species |

#### 5.3.4.7.2 Field Study Results

No rare or protected invertebrate species were recorded during the site visit conducted in May 2024. The survey found a distinct lack of ecological features typically associated with supporting diverse or significant invertebrate populations. The site is characterised by a heavily urbanised landscape with minimal vegetation cover, no standing or flowing waterbodies, and limited structural diversity in terms of microhabitats such as dead wood, flowering plants, or undisturbed soil. These conditions significantly reduce the availability of foraging, breeding, and sheltering opportunities for both terrestrial and aquatic invertebrates.

However, the site is located immediately adjacent to Lough Atalia and Galway Bay, two ecologically important waterbodies known to support a range of aquatic and semi-aquatic invertebrate species. While the site itself lacks suitable habitat, its proximity to these waterbodies may offer some indirect ecological value, particularly in terms of potential connectivity or edge effects.

Therefore, applying the precautionary principle, the site is considered to be of 'Local Importance (Higher value)' for invertebrates, despite the absence of notable invertebrate records during the survey.

### 5.3.4.8 Fish

#### 5.3.4.8.1 Desk Study Results

There are 23 species of fish recorded in the M32C and M22X grid squares within the last 20 years. Of these, 2 are endangered (Table 5-16).

*Table 5-16 Records of Fish for the M32C and M22X 2km grid Squares Associated with the Site from the NBDC*

| Species | Grid square(s) | Date of last record | Source | Designation |
|---|---|---|---|---|
| **European Eel** (*Anguilla anguilla*) | M22X | 19/10/2024 | Explore Your Shore | Threatened Species: Critically Endangered. |
| **Thornback Ray** (*Raja clavata*) | M22X | 18/04/2023 | Explore Your Shore | Threatened Species: OSPAR Convention. |

#### 5.3.4.8.2 Field Study Results

The site does not contain any waterbodies, and, as such, targeted fish surveys were not done. However, although the site itself does not contain any standing or flowing waterbodies, it is situated immediately adjacent to a watercourse that connects Lough Atalia to Galway Bay. This proximity to a hydrologically linked system enhances the ecological relevance of the site, particularly in relation to aquatic fauna. Lough Atalia and Galway Bay are known to support a variety of fish species, including estuarine and marine taxa, some of which may utilize transitional waters and adjacent habitats for foraging, migration, or spawning. Therefore, surveys to confirm same were not required, and, while no direct aquatic habitat is present within the site boundary, the potential for indirect ecological connectivity cannot be discounted.

Applying the precautionary principle, which advocates for erring on the side of environmental protection in the face of uncertainty, the site is therefore considered to be of 'Local Importance (Higher Value)' for fish.

This classification reflects the site's proximity to these nearby aquatic ecosystems, despite the absence of intrinsic water features.

#### *5.3.4.9 Other Protected and/or Notable Species*

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. Mayo. No suitably sheltered and moist habitats available.
  - Slender Naiad (*Najas flexilis*) – A clear water, lowland lake species. Generally found within inland lakes. No suitable habitat available at the site. Nearest records occur upstream of the Development site.
- **Fauna**
  - White-clawed Crayfish (*Austropotamobius pallipes*) – Not present in Galway Bay.
  - Freshwater Pearl Mussel (*Margaritifera margaritifera*) – Nearest known records are associated with Lough Corrib and are upstream of the Proposed Development.
  - Natterjack Toad (*Epidalea calamita*) – Distribution restricted to few coastal sites. Not present in Galway Bay.
  - Kerry Slug (*Geomalacus maculosus*) – Distribution restricted to south and west of Ireland. Not present in Galway Bay.

### 5.3.5 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)[8].

Fauna that has the potential to utilise the site and immediate area of the Proposed 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 impacts of the Proposed Development on the identified KERs are assessed in Section 5.5. Table 5-17 below summarises the evaluation rating assigned to each ecological feature and the rationale behind these evaluations is also provided.

[8] It should be noted that in addition to mitigations outlined in the Natura Impact Statement, mitigation measures are also included in the CEMP and this report that will by poxy serve to protect all habitats and species of Galway bay irrespective of their evaluation here and whether or not they are put forward as KERs.

*Table 5-17 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) |
|---|---|---|---|
| **DESIGNATED SITES** | | | |
| European sites | International Importance | Four European sites lie within the ZOI of the Proposed Development, however, mitigation as outlined in the accompanying NIS has ruled out the potential for significant effects on the integrity of any of these European sites because of the Proposed Development. Thus, European sites are not considered further within this report. | No |
| Nationally designated sites (pNHAs, NHAs) | National Importance | These designated sites within the ZOI of the Proposed Development are sufficiently mitigated by proxy by the mitigation measures outlined in the NIS so that no impacts on their designated features are anticipated as a result of the Proposed Development. | No |
| International sites (I-WeBs. Ramsar, IBA) | International Importance | | No |
| **HABITATS** | | | |
| Buildings and Artificial Surfaces (BL3) | Less than Local Importance | This habitat is man-made and of little to no value. | No |
| Dry Meadows & Grassy Verges (GS2) | Local Importance (Lower Value) | The loss of this very small section of low value habitat will not be of significance. | No |
| **LINKED AND ADJACENT HABITATS** | | | |
| Habitats of Galway Bay and Lough Atalia | National/International Importance | This habitat is directly outside the site boundary to the south and east, however, these habitats are sufficiently mitigated by proxy by the mitigation measures outlined in the NIS so that no impacts on their designated features are anticipated as a result of the Proposed Development. | No |
| Species of Galway Bay and Lough Atalia | National/International Importance | Species such as seal are known to occur in the waters of Galway Bay, impacts on these species are sufficiently mitigated by proxy by the mitigation measures outlined in the NIS so that no impacts on their designated features are anticipated as a result of the Proposed Development.<br><br>However, it should be noted that in addition to mitigations outlined in the Appropriate Assessment, mitigation measures are also included in the CEMP and below that will serve to protect all habitats and species of Galway bay. | No |

| Species / Species Group | Evaluation | Rationale | Key Ecological Receptor (KER) |
|---|---|---|---|
| **SPECIES AND SPECIES GROUPS** | | | |
| **Bat Assemblage** | Local Importance (Higher Value) | No roosting bats were identified at the site, nor were any bats recorded visually or acoustically during the transect survey. However, owing to the site's location in an area of high bat suitability, near Galway bay, it is considered that the potential for bats to occur cannot be ruled out, and mitigations are proposed. | **Yes** |
| **Wintering Bird Assemblage** | Local Importance (Higher Value) | A variety of red, amber, and green listed wintering birds were recorded utilizing the site and the Galway Bay to the east and south, with some infrequent occurrences of Annex I species. Wintering birds may be subject to impacts in the absence of mitigation. | **Yes** |
| **Breeding Bird Assemblage** | Local Importance (Higher Value) | A variety of red, amber, and green species listed were recorded at the site.<br>Bird species utilizing the site have the potential to be significantly affected by the Proposed Development in the absence of mitigation. | **Yes** |
| **Larger Terrestrial Mammals** | Local Importance (Higher Value) | No resting sites for mammals such as badger or otter were identified at the site nor were any resting sites located within 150m of the site along the Bay. Similarly, no evidence of foraging or commuting mammals was identified at or within 150m of the site and it is presumed the site is not of importance to badger.<br>Otter, however, are known to frequent the bay and were observed within the waters of the bay during field surveys. As such otter has the potential to be significantly impacted by the Proposed Development in the absence of mitigation. | **Yes** |
| Small Terrestrial Mammals:<br>Eurasian pygmy shrew (*Sorex minutus*).<br>Irish hare (*Lepus timidus subsp. hibernicus*). | Local Importance (Lower Value) | There are no suitable habitats on site for small mammal species, and as such, mitigations for impacts on same are not required. | No |

| Species / Species Group | Evaluation | Rationale | Key Ecological Receptor (KER) |
|---|---|---|---|
| Irish stoat (*Mustela erminea subsp. hibernica*).<br>West European hedgehog (*Erinaceus europaeus*).<br>Wood mouse (*Apodemus sylvaticus*) | | | |
| Amphibians | Less than Local Importance | There are no suitable habitats present on site to support amphibians | No |
| Common Lizard | Local Importance (lower Value) | Some suitable habitats in areas of hard standing may provide basking spots. No desk study records but this species is widespread throughout Ireland and thus presumed present. | No |
| Invasive Species | Local Importance (Lower Value) | As this is not a high-level invasive species and the level of infestation is limited to a single sycamore tree, the need for mitigations beyond best practice for the treatment of same is not envisaged. | No |
| **Invertebrates** | Local Importance (Higher Value) | Owing to the highly modified nature of and lack of vegetation/waterbodies within the site, there is little suitable habitat present to support invertebrate species. However, owing to the site's proximity to Galway Bay, the potential for impact on same arising from the Proposed Development is considered possible, | **Yes** |
| **Fish** | Local Importance (Higher Value) | There are no suitable habitats present on site to support fish, owing to the proximity of the site to Galway bay, the potential for impact on same arising from the Proposed Development is considered possible, | **yes** |

## 5.4 Characteristics of the Proposed Development

### 5.4.1 Site Location & Description

The Proposed Development site is approximately 1.621 hectares and is located within the existing operational area of Galway Port at Dock Road and Lough Atalia Road, Galway City. The site also extends to include parts of Dock Road and Lough Atalia Road to the southwest and northwest, respectively for road infrastructure works and water services and infrastructure works. The site is somewhat irregular in shape and is generally bound to as follows: by the

Lough Atalia inlet/outlet to the east; by Dock Road to the south and southwest; and by lands in use for port activities and as a service station to the west.

For further site location information and current site usage details, please refer to Chapter 2 (Description of the Proposed Development) of this EIAR Report. The Site Location is also provided in Figure 5-9 below.

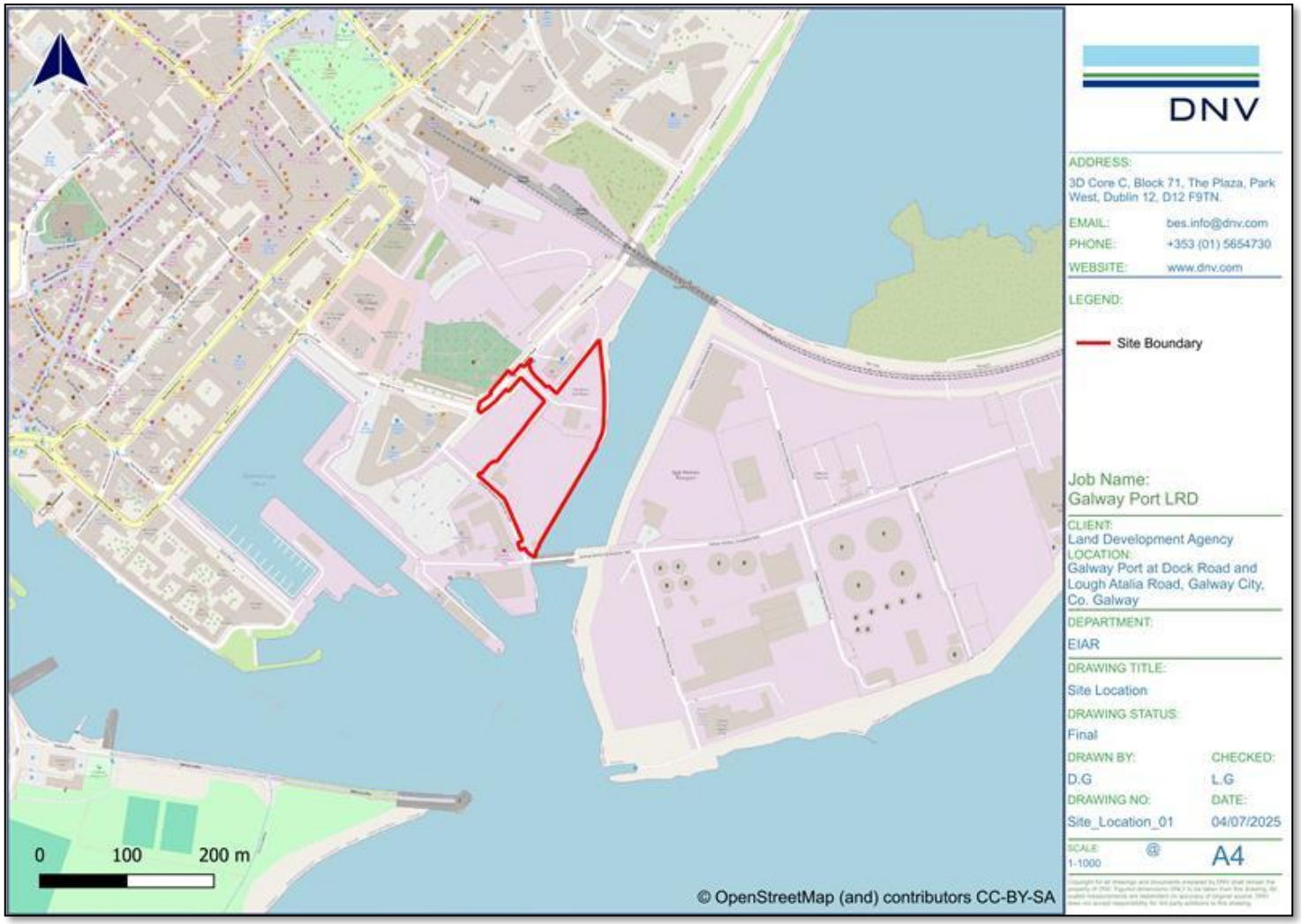



*Figure 5-9 Site Location (QGIS, 2025).*

### 5.4.2 Proposed Development Description

A comprehensive description of the Proposed Development is presented in Chapter 2 (Description of the Proposed Development) of this EIAR, while Figure 5-10 shows the Proposed Site Layout, and Figure 5-11 Proposed Phasing Plan (Altu Architects, 2025) below.




*Figure 5-10 Site Layout (Altu Architects, 2025)*




*Figure 5-11 Proposed Phasing Plan (Altu Architects, 2025)*

#### *5.4.2.1 Drainage & Water Supply*

#### *5.4.2.2 Potable Water*

The following summarises the potable water design provided in the Civil works Design Report (TOBIN, 2025) under separate cover:

The proposed water supply for the development involves connecting a 200mm watermain to an existing 300mm Uisce Éireann watermain located along Lough Atalia Road, just north of the site entrance. This 200mm pipe size meets Uisce Éireann's specifications for servicing the development. The watermain layout is detailed in the Civil Works Design Report and shown on drawing no. 11910-2001. A pre-connection enquiry for the water demand of 400 residential units was submitted to Uisce Éireann, and a Confirmation of Feasibility was received. All watermain designs will undergo a full review by Uisce Éireann before a formal connection offer is issued.

#### *5.4.2.3 Surface Water*

According to the Civil Works Design Report (TOBIN, 2025) provided under separate cover, the following is proposed in relation to surface water:

The proposed stormwater drainage system has been designed to manage all surface water runoff generated from hard surfaces within the development, including roads and rooftops. As part of the system, all surface water will first pass through oil and petrol interceptors, which are engineered to remove hydrocarbons and other pollutants. Following this treatment, the water will be directed to one of two proposed attenuation units, which are designed to temporarily store runoff and control the rate of discharge, thereby reducing the risk of downstream flooding and improving water quality.

Embedded SuDs measures are detailed in Section 5.6.2 below.

#### *5.4.2.4 Foul Drainage*

Foul water from the Proposed Development will be treated at the Mutton Island Wastewater Treatment Plant (WwTP), which is located approximately 1.6 kilometres (km) to the south of the site (in Galway Bay). Mutton Island WwTP has capacity (total of 170,000 population equivalent (pe)) available to accommodate the Proposed Development's foul drainage. As such, foul water impacts can be ruled out and are not discussed further within this Report.

According to the Civil Works Design Report (TOBIN, 2025) provided under separate cover, the following is proposed in relation to foul drainage:

The proposed wastewater network for the development will operate via gravity discharge to an existing combined sewer located at the north-west corner of the site. The foul sewer system has been designed using Causeway Flow software and is illustrated in drawing no. 11910-2002. A pre-connection enquiry for wastewater discharge from 400 residential units was submitted to Uisce Éireann, and a Confirmation of Feasibility was received, which is included in Appendix D of the Civil Works Design Report. All foul sewer designs will be reviewed and approved by Uisce Éireann before a formal connection offer is issued. In accordance with Section 3.6 of Uisce Éireann's Code of Practice for Wastewater Infrastructure (UE-CDS-5030-03),

the dry weather flow (DWF) is calculated at 450 litres per dwelling, equating to 2.7 population equivalent (P.E.) per unit, including a 10% infiltration rate. The pipework, also designed using Causeway Flow, will consist of thermoplastic structured wall pipes with a maximum diameter of 225mm and gradients ranging from 1/60 to 1/200. Flow velocities within the network comply with the required range of greater than 0.75 m/s (self-cleansing velocity) and less than 2.5 m/s, as specified in the Code of Practice.

### 5.4.3 Landscape Plan

The Proposed Landscape Plan has been prepared by Stephen Diamond Associates, Chartered Landscape Architects (December 2024). An overview of the Master Landscape Design is included below but can be viewed in further detail under separate cover, accompanying this application.

The Proposed Landscape Plan includes the following elements:

- Grass Lawns; free-draining, back-filled, seed sown with low maintenance grass.
- Wildflower Meadows; sown with native plant mix, low maintenance, cut a maximum of 1-2 times per annum)
- Planting Shrubs, Perennials, & Groundcover; flowering, shade tolerant and pollen rich plants.
- Native Trees and Hedgerows; Comprising native tree species to include clear and multi-stemmed trees, and a;
- Green Wall; with climbing plants.

(See Figure 5-12).

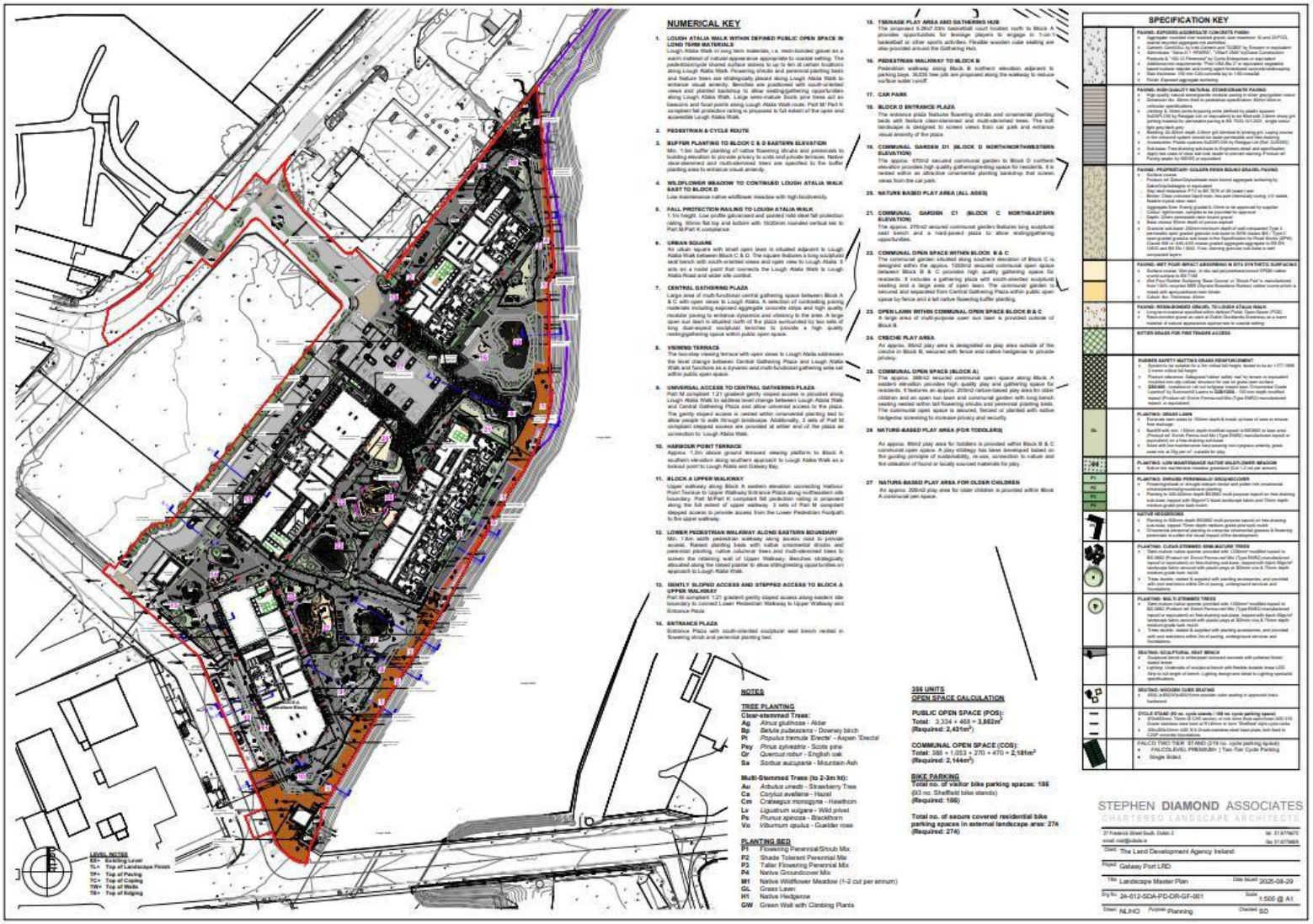



*Figure 5-12 Proposed Landscape Masterplan (Stephen Diamond Associates, July 2025).*

### 5.4.4 Lighting Plan

The outdoor lighting report and drawing produced by Axiseng (2025) detail the approach to public lighting at the Proposed Development. The accompany this application under separate cover.

### 5.4.1 Description of the Construction phase

#### *5.4.1.1 Construction Schedule*

The Proposed Development will be executed in two distinct phases to facilitate a staged occupation. The proposed sequence of construction outlined below is subject to confirmation once the building contract has been awarded and on completion of the Detailed Construction Management Plan for agreement with Galway City Council. The overall duration of the project is anticipated to span approximately 27 months (excluding the demolition phase), starting with Blocks A and B, followed by Blocks C and D.

Sequencing of the various phases proposed is as follows:

**Demolition Phase (Approximately 3 months):**

- Demolition of the existing office / bus depot building (370.2 sq m) and ancillary building (26.0 sq m);
- Partial demolition of the existing ESB sub-station and ancillary building (67.4 sq m); and
- Demolition of existing boundary walls at the south-west and north-west of the site.

**Construction Phase 1 (Approximately 15 months):**

- Construction of Blocks A and B (186 no. units);
- Road works along Dock Road;
- New internal street and parking court;
- Upgrade of road adjacent to petrol filling station;
- Installation of toucan crossing and associated footpath; and
- Landscaping around public square, courtyard and Lough Atalia Walk.

**Construction Phase 2 (Approximately 12 months):**

- Construction of Blocks C and D (170 no. residential units); and
- Completion of landscaping, including the remainder of Lough Atalia Walk.

#### *5.4.1.2 Water Drainage during Construction*

During construction, surface water will be managed as follows:

- Weather conditions and typical seasonal weather variations will be taken into account when planning stripping of topsoil and excavations with the objective of minimizing soil erosion.
- All oils, fuels, paints and other chemicals will be stored in a secure bunded hardstand area. Refuelling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any surface water inlets (where not possible, such activities are to be carried out off site).

- Concrete batching will take place off site and wash down and wash out of concrete trucks will take place off site (at authorized concrete batching plant locations in full compliance with relevant planning and environmental consents).
- The construction compound will include adequate staff welfare facilities including foul drainage and potable water supply. Foul drainage discharge from the construction compound will be tankered off-site to a licensed facility until a connection to the public foul drainage network has been established.

These measures are best practice measures and in line with the Greater Dublin Regional Code of Practice for Drainage Works (Dublin City Council, 2021). The first objective of the Code of Practice is Compliance with best environmental practices and relevant environmental legislation such as the Water Framework Directive.

### 5.4.2 Description of the Operational phase

The operational phase of the Proposed Development will see the use of the site as intended through the occupation of residential dwellings and operation of the associated crèche, 2 no. café/restaurants and 1 no. retail unit.

It is anticipated that road use (vehicular, cyclists and pedestrian activity) along Lough Atalia Road will increase from the existing baseline as a result of the Proposed Development due to an increase in residential traffic in the area.

## 5.5 Potential Effects of the Proposed Development

### 5.5.1 Construction phase

#### *5.5.1.1 Effects on Fauna*

##### *5.5.1.1.1 Bats*

A Preliminary Bat Roost and Habitat Suitability Assessment conducted in May 2024 found that the site offers negligible potential for roosting, commuting, or foraging bats. The bat transect survey which was carried out in June 2025 recorded no bat activity, with no individuals observed or detected acoustically. Although the site is located near Galway Bay and Lough Atalia, which may support bats at a broader landscape scale, the site itself was assessed as having Low suitability due to its limited habitat value and urban context, and subsequently 'Negligible' suitability to support bats upon completion of the transect surveys.

Although no bat activity was recorded during the survey and the site itself offers limited habitat value, it is located within an area classified as having medium to high suitability for bats, according to the NBDC Bat Habitat Suitability Index. Furthermore, the site's proximity to Galway Bay and the estuarine environment increases the likelihood that bat species may be present in the wider area, as estuaries and shorelines can be rich in insect prey, especially near mudflats, saltmarshes, or areas with high organic content, attracting species like *Pipistrellus* and *Myotis*. As such, these species could be using nearby estuarine/shoreline habitats for commuting or foraging. It is considered that potential impacts may arise from increased noise, artificial lighting, and human activity, which can disrupt bat behaviour and reduce habitat quality in the surrounding area.

Applying the precautionary principle, the construction phase of Proposed Development, has the potential to result in a *negative, short-term impact, of slight* effect on the local bat assemblage in the absence of appropriate mitigation.

#### *5.5.1.1.2 Wintering Birds*

Although the site itself is of low ecological value for avifauna, its proximity to ecologically sensitive areas, namely Galway Bay, Lough Atalia, and Lough Corrib, necessitates the application of the precautionary principle, and thus a higher value, for robust assessment of the project on ecological features extant within the site, and it's immediate surrounds, which it is connected to, and could potentially impact.

During construction, increased noise and dust levels, along with the loss of limited nesting habitat, and increased human presence, may cause *short-term, negative, moderate* impacts on local bird populations.

Such disturbances can disrupt bird behaviour, reduce habitat quality, and affect species of conservation concern that rely on the adjacent aquatic and coastal environments for foraging, roosting, and breeding. Furthermore, water quality impacts arising from the construction phase of the Proposed Development could further displace protected bird species by negatively impacting on prey availability.

As a result, in the absence of appropriate mitigation, it is considered that water quality impacts arising from the Proposed Development, has the potential to result in *short term, negative* impacts of *moderate* significance on bird species.

#### *5.5.1.1.3 Breeding Birds*

As with the previous Section, while the site itself is of low ecological value for avifauna, increased water quality impacts, noise, dust, and human presence during the construction phase could result in disturbance/displacement to local birds breeding in the area. This would present a *Short-term, negative, moderate* impact.

#### *5.5.1.1.4 Large Terrestrial Mammals*

The mammal survey found no evidence of terrestrial mammal activity or use of the site. Situated within a heavily urbanised environment, the site lacks the ecological features typically required to support non-volant mammals, such as vegetative cover, natural soils, and structural habitat diversity. It is ecologically isolated, bordered by dense infrastructure that forms part of the existing urban fabric of Galway City, and does not function as a commuting corridor or habitat linkage for species such as badger, European hedgehog, or pygmy shrew.

Although no evidence of marine mammals was recorded during the walkover or dedicated otter survey, the site lies adjacent to Lough Atalia and Galway Bay, which are known to support species such as otter (*Lutra lutra*) and harbour seal (*Phoca vitulina*). While the site itself does not provide suitable breeding or foraging habitat for terrestrial or aquatic mammals, its proximity to these designated aquatic environments means that mobile species may occasionally and opportunistically traverse or investigate the site. This is particularly plausible for otters, which are known to travel overland between water bodies and may explore adjacent terrestrial areas. However, the site lacks key features typically associated with otter habitat, such as freshwater access, dense riparian vegetation, or undisturbed resting places.

As such, while the site may be marginally used by mobile species, it does not provide the ecological functions, such as foraging, breeding, or shelter, necessary to qualify it as a functional buffer zone. A true buffer zone would typically offer transitional or supportive habitat that mitigates edge effects, supports ecological connectivity, or provides a protective margin around a designated site. In contrast, the site's artificial surfaces, lack of vegetation, and absence of natural features mean it does not fulfil these roles.

In summary, while the site may be occasionally traversed by mobile species like otter due to its proximity to Galway Bay, it does not meet the criteria to be considered a buffer zone in ecological or planning terms. The Proposed Development is therefore unlikely to result in significant impacts on non-volant terrestrial mammals. However, indirect impacts on adjacent aquatic habitats, such as disturbance, pollution, or habitat degradation via water quality impacts, could potentially affect marine mammals.

These risks represent a *short term, negative impact of moderate significance* in the absence of mitigation.

#### *5.5.1.1.5 Invertebrates*

During the construction phase of the Proposed Development, potential effects on invertebrates, despite the site's limited ecological value, should be considered in light of its proximity to Lough Atalia and Galway Bay. Although no rare or protected invertebrate species were recorded during the May 2024 survey, and the site itself is heavily urbanised with minimal vegetation, no waterbodies, and limited microhabitat diversity, indirect impacts may still arise. Construction activities could generate dust and airborne particulates, which may settle on adjacent vegetation or water surfaces, potentially affecting invertebrate food sources and respiratory systems (of bivalves for example). Surface water runoff, particularly if contaminated with sediments or pollutants, poses a risk to water quality in nearby aquatic habitats, potentially harming sensitive invertebrate communities. Noise and vibration from machinery, while less impactful for most invertebrates, could disturb soil-dwelling species in adjacent areas. Artificial lighting during night-time works may disrupt nocturnal invertebrate behaviour, especially in semi-natural habitats nearby. Collectively, these risks represent a *short term, negative* impact of *moderate* significance. These potential indirect effects should be carefully managed through appropriate mitigation measures.

#### *5.5.1.1.6 Fish*

During the construction phase of the Proposed Development, potential indirect effects on fish species must be considered due to the site's immediate proximity to a watercourse that connects Lough Atalia to Galway Bay. Although the site itself contains no standing or flowing waterbodies, its location adjacent to a hydrologically linked system enhances its ecological relevance, particularly for aquatic fauna. Lough Atalia and Galway Bay support a variety of estuarine and marine fish species, some of which may utilise transitional waters and nearby habitats for foraging, migration, or spawning. Construction activities could result in surface water runoff, sedimentation, or accidental pollutant discharge, all of which pose risks to water quality and aquatic habitat integrity. Such impacts could disrupt fish behaviour, reduce food availability, or impair spawning success.

Additionally, increased noise and vibration from construction works may disturb sensitive species, particularly during key migratory or breeding periods. The introduction of invasive species or alterations to hydrological connectivity could further degrade habitat quality.

Therefore, applying the precautionary principle, these risks represent a *short term, negative* impact of *moderate* significance, and appropriate mitigation measures should be implemented to prevent indirect impacts on these nearby aquatic ecosystems.

### 5.5.2 Operational phase

#### *5.5.2.1 Effects on Habitats and Flora*

Overall, the Proposed Development is considered to have a *positive, long-term, moderate* impact on habitats and flora present within the site, as the proposal will see a significant increase in habitat and flora diversity on site, in line with the planting schedule of the landscape plan.

#### *5.5.2.2 Effects on Fauna*

##### *5.5.2.2.1 Bats*

Overall, the Proposed Development is anticipated to have a *positive, long-term, moderate* impact on local nocturnal fauna, including bat populations, during the operational phase, primarily due to the integration of biodiversity-enhancing landscape features. These measures will improve habitat quality, increase foraging opportunities, and enhance ecological connectivity across the site and the wider landscape.

Elements of the Proposed Development which are considered to provide positive contributions to local bat conservation include:

- Enhanced Foraging Habitat: The inclusion of native hedgerows, semi-mature native trees, and nectar-rich perennials will support a diverse and abundant insect population, providing a reliable food source for foraging mammals and bats.
- Improved Habitat Connectivity: Linear features such as hedgerows and tree lines will function as commuting corridors, facilitating safe movement between roosting, sheltering, and foraging areas while reducing exposure to predators.
- Shelter and Roosting Potential: Semi-mature native trees (e.g., oak) may, over time, offer natural roosting opportunities. Green walls and dense vegetation will also contribute to microhabitat diversity.
- Low-Disturbance Green Spaces: Nature-based play areas and communal gardens with native planting will create a more naturalistic and less intensively managed environment, which is generally more conducive to promoting biodiversity and maintaining connectivity within the site.
- Alignment with Biodiversity Policy: The proposed measures are consistent with national biodiversity strategies and contribute to the ecological resilience of the Galway Bay coastal zone.

However, in the absence of suitable mitigation measures, nocturnal species which may be using the area may experience the following as a result of operation phase lighting proposed as part of the Development:

- Disruption of commuting routes
- Reduced foraging efficiency
- Delayed emergence from bat roosts
- Increased predation risk

These impacts would represent a *permanent, negative, moderate impact* on nocturnal species using the area (in the absence of suitable mitigation).

#### *5.5.2.2.2 Wintering Birds*

Potential impacts resulting from the operational phase and affecting wintering birds may include increased noise and visual disturbance as a result of the increased human presence at the site, as well as increased artificial lighting along the coastline which could distract or disorient seabirds or migrating birds in flight. Additionally, the proposed structures at the site could lead to an increase in bird collisions. These are discussed in more detail below.

***Light Disturbance***

Artificial light, particularly along coastal areas, can disorient sea and coastal bird species like those found along the shoreline or offshore to the south of the Proposed Development, potentially disrupting normal flight or migration patterns. This will be lessened by the proposed planting within the landscape plan which will provide some screening effect. In the absence of appropriate mitigation measures, this could constitute *negative, permanent, moderate* effects on local wintering birds.

***Human Noise/Visual Disturbance***

Wintering birds may react to noise and visual stimuli created by increased human presence as a result of the Proposed Development, in particular, walkers using the surrounding pathways that border the shoreline by flushing[9], wasting energy that would be otherwise used for productive activity such as foraging or migration; the ability of more sensitive species to survive or breed may also be impacted (Cutts et al, 2009). While noise disturbance from walkers is unlikely, visual disturbance alone could elicit a response in waterbirds using the shoreline. Furthermore, dog walkers, particularly those with off-leash dogs, will cause disturbance to waterbirds in the vicinity. Cutts et al (2009) defines visual disturbance and the distance at which certain waterbirds will exhibit behavioural responses in the below Figure 5-13. This could increase in human disturbance constitute *negative, permanent, moderate* effects on local wintering birds in the absence of mitigation.

[9] In bird behaviour, flushing refers to the act of a bird suddenly taking flight or fleeing from its resting, feeding, or nesting area-typically in response to a perceived threat or disturbance, such as the approach of a human, predator, or vehicle

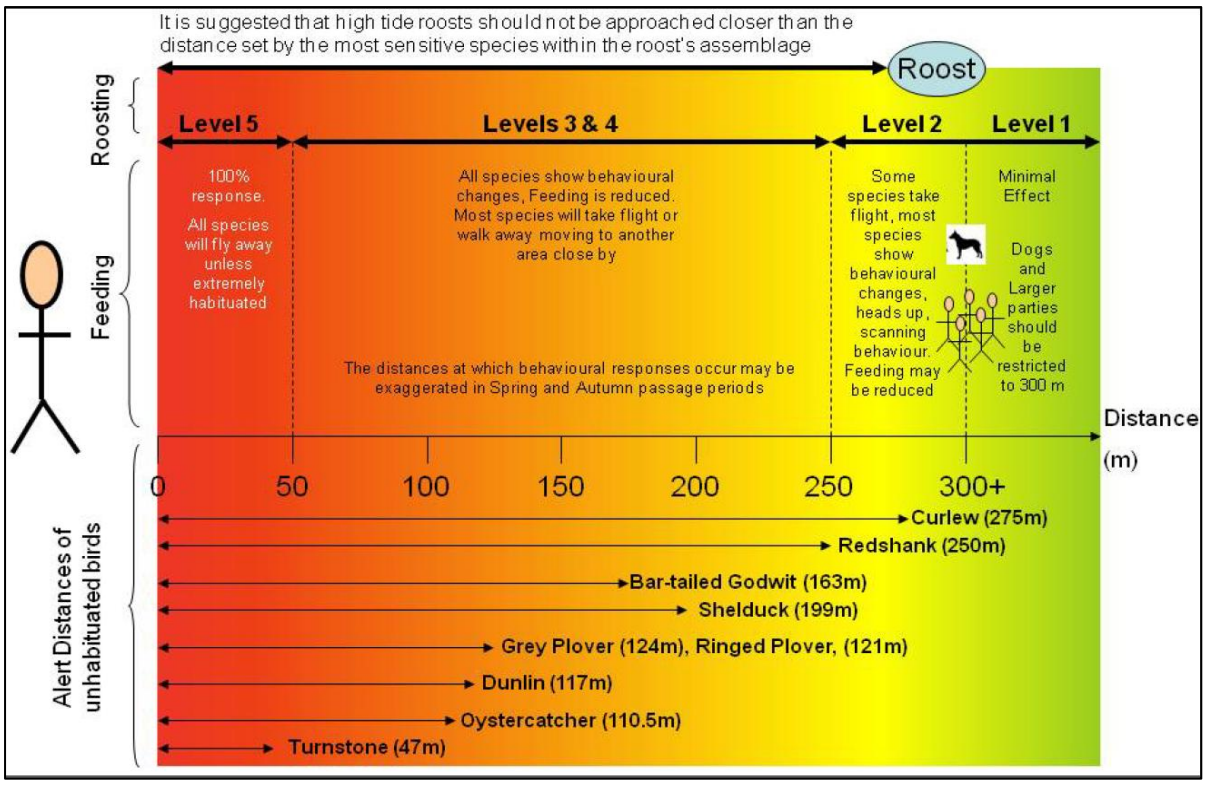



*Figure 5-13 Visual Disturbance Sensitivity of Waterbirds along Shorelines Extracted from Cutts et al (2009).*

There is no potential collision risk for bird species as a result of the embedded mitigation measures incorporated into the design of the proposed structures at the site, as outlined below in Section 5.6.2.

#### *5.5.2.2.3 Breeding Birds*

The Proposed Development will be consistent with the existing urban fabric of Galway City, and bird species present are considered to be habituated to this urban environment. Therefore, noise and human activity disturbance impacts to bird species as a result of the operation of the Proposed Development would therefore be reduced.

However, adopting a precautionary approach, potential impacts during the operational phase include disturbance from increased artificial lighting along the coastline which could distract or disorient breeding seabirds, potentially leading to decreased foraging or nest abandonment during breeding season, in particular, 'tubenose' species, which include puffins, shearwaters, petrels and terns (Laguna et al., 2014). In the absence of appropriate mitigation measures, this could constitute *negative, permanent, significant* impacts on breeding seabirds in the locality.

The retention of boundary habitats alongside the proposed additional planting included as part of the landscaping for the site will offer potential commuting, foraging, and nesting habitat for local birds. In this case, the main boundary habitat to the site is the rock armour lining the shoreline. Some waterbirds are known to nest in rock armour, particularly species that favour open, stony or coastal habitats. Birds such as oystercatchers, ringed plovers, and occasionally gulls may use rock armour for nesting, especially where natural habitats are limited. These

artificial structures can offer shelter and proximity to feeding areas, making them suitable nesting sites under certain conditions.

As such, accounting for the retention of the above in conjunction with the additional planting proposed, the likely effect is considered *positive, permanent* and *slight* at the local level, due to the increase of available resources and habitats at the site.

#### *5.5.2.2.4 Large Terrestrial Mammals*

As discussed in 5.5.1.1.4 above, while the site may be occasionally traversed by mobile species like otter due to its proximity to Galway Bay, it does not meet the criteria to be considered an important habitat or buffer zone in ecological or planning terms.

The Proposed Development is therefore unlikely to result in significant impacts on non-volant terrestrial mammals. However, impacts on adjacent aquatic habitats, such as disturbance, pollution, or habitat degradation via water quality impacts, could potentially affect species such as otter which are present in the vicinity. These risks represent a *short term, negative* impact of *moderate* significance in the absence of mitigation.

#### *5.5.2.2.5 Invertebrates*

During the operational phase of the Proposed Development, potential impacts on invertebrates, though likely to be indirect, should still be considered, particularly given the site's proximity to ecologically important waterbodies such as Lough Atalia and Galway Bay. While the site itself lacks suitable habitat features for supporting diverse invertebrate populations, long-term changes associated with residential occupation may influence local invertebrate communities. Increased artificial lighting can disrupt nocturnal invertebrate activity, including feeding, mating, and navigation behaviours. Ongoing human activity and landscape management, such as regular mowing, pesticide or herbicide use, and removal of organic debris, may further reduce the availability of microhabitats and food resources within the site, so landscaping maintenance needs to be considered.

Additionally, increased impermeable surfaces and altered drainage patterns could affect water quality in adjacent aquatic systems, potentially impacting aquatic invertebrate populations.

It should be noted however that conversely, the Development, which has been designed with biodiversity in mind, offers enhancement opportunities such as the creation of invertebrate habitat through the inclusion of green infrastructure such as pollinator-friendly planting, green and green roofs. Enhancement opportunities are provided in detail in Section 5.6.4 below. Therefore, while the operational impacts are likely to be low given the current habitat quality, careful planning and management have been integral to the project design, so as to avoid further degradation (through appropriate mitigations and project design) and to deliver ecological gains (through enhancement measures) for biodiversity in the long term, representing a represent a *long term, positive* impact of *moderate* significance.

#### *5.5.2.2.6 Fish*

As with invertebrates above, during the operational phase of the Proposed Development, potential indirect impacts on fish species should be considered due to the site's immediate proximity to a watercourse that connects Lough Atalia to Galway Bay, both of which support a range of estuarine and marine fish species. Although the site itself lacks aquatic features, long-term changes associated with the Proposed Development may influence the quality and

function of adjacent aquatic habitats. Increased surface runoff from impermeable surfaces such as roads, pavements, and rooftops can carry pollutants (e.g. hydrocarbons, heavy metals, nutrients) into the nearby watercourse, potentially degrading water quality and affecting fish health, behaviour, and reproductive success. Altered drainage patterns may also impact flow regimes, sediment transport, and connectivity within the aquatic system. Furthermore, artificial lighting from residential areas may disrupt natural light cycles, potentially affecting fish migration and spawning cues, particularly for species sensitive to photoperiod changes. Noise and human activity along the watercourse edge may also contribute to disturbance. However, with appropriate design and management, such as sustainable drainage systems (SuDS), vegetated buffer zones, and pollution control measures, these impacts can be minimised. These risks represent a represent a *short term, negative* impact of *moderate* significance in the absence of mitigation.

Applying the precautionary principle, the site remains of 'Local Importance (Higher Value)' for fish, and operational-phase planning should aim to protect and enhance the ecological integrity of adjacent aquatic environments, as such, mitigation and enhancement measures are included below to address this.

### 5.5.3 Potential Cumulative Impacts

The potential for cumulative effects as a result of the Proposed Development being undertaken simultaneously with other large-scale proposals and projects in the vicinity of the site (within 500m) is assessed below in Table 5-18.

The selection of a 500m radius for assessing cumulative biodiversity effects is informed by guidance from the Chartered Institute of Ecology and Environmental Management (CIEEM), which recommends that spatial boundaries in EcIA should be ecologically meaningful and proportionate to the scale and nature of the Proposed Development.

Key Justifications:

1. Ecological Relevance: The 500m buffer encompasses adjacent habitats and ecological corridors that may be functionally connected to the Proposed Development site. This includes Galway Bay and Lough Atalia, which support a range of aquatic, intertidal, and coastal habitats used by mobile species such as birds, bats, and otters. These species may be sensitive to cumulative pressures such as noise, light, and habitat fragmentation.

2. Urban Context and Development Density: In urban and peri-urban settings, a 500m radius is commonly used[10] to capture developments that may contribute to shared pressures on biodiversity. This distance is sufficient to include projects with overlapping construction or operational phases that could interact with the Proposed Development in terms of disturbance, pollution, or habitat loss.

3. Best Practice and Proportionality: CIEEM guidance[11] emphasizes that the spatial scope of cumulative assessments should be proportionate to the likely zone of influence of the project.

[10] Example: Appendix D - EcIAR.pdf

[11] Chartered Institute of Ecology and Environmental Management (CIEEM). (2018, updated 2022). Guidelines for Ecological Impact Assessment in the UK and Ireland. Version 1.3.
Available at: https://cieem.net/resource/guidelines-for-ecological-impact-assessment-ecia/

A 500m radius strikes a balance between ecological thoroughness and practical feasibility, ensuring that relevant developments are considered without diluting the analysis with distant projects of negligible relevance.

4. Planning Precedent: The 500m buffer aligns with precedent in Irish planning practice, where cumulative assessments for urban development's often adopt this scale to evaluate interactions with nearby infrastructure and land-use changes[12].

*Table 5-18 Assessment of Cumulative Effects in Relation to the Proposed Development and Other Developments within the Vicinity of the Site*

| Planning Reference | Planning Authority | Status | Location |
|---|---|---|---|
| **20/47, (ABP/ACP Ref. 310568-21)** | **Galway City Council** | **Granted** | **Ceannt Station** |
| **Development Description**<br><br>*The proposed development is for a mixed-use urban regeneration project with an overall gross floor area of approximately 114161sq. m.*<br><br>**Potential for In-combination effects**<br><br>An NIS was produced for this proposal stating that, in the absence of mitigation, there was the potential for impacts to *Galway Bay Complex SAC* and *Inner Galway Bay SPA*. The NIS concludes that "*there will be no significant effects due to displacement, collision, habitat loss/disturbance, noise and contamination on the nearby Natura 2000 sites, their relevant qualifying interests or species of conservation interest and conservation objectives nor on the integrity of associated European sites." In terms of general ecology, the project may contribute to cumulative habitat loss, disturbance to urban-adapted fauna, and increased artificial lighting. However, owing to the already urbanized nature of the site, the risk of significant cumulative biodiversity effects is considered low.*<br><br>Thus, there is **no potential for in-combination effects** as a result of this proposal being undertaken simultaneously with the Proposed Development. | | | |
| **ABP- 314597-22** | **Galway City Council** | **Granted** | **University Road to Dublin Road** |
| **Development Description**<br><br>*BusConnects Galway Project consists of alteration of existing road layouts, including junction layouts, footpaths, signaling, pedestrian crossings, drainage, and other associated works.*<br><br>**Potential for In-combination effects**<br><br>The NIS accompanying this proposal identified hydrological pathways between the proposal and Inner Galway Bay SPA and Galway Bay Complex SAC and subsequently outlines a suite of surface water protection measures to ensure there is no potential for significant effects on these European sites. The NIS concludes, "*with the implementation of appropriate mitigation measures specifically with regard to surface water, significant effects on the Lough Corrib or Galway Bay European Sites can be ruled out*" and includes a suite of mitigation measures, which , in tandem with the mitigation measures outlined within the NIS Report for this project are deemed sufficient to ensure there is **no potential for significant in-combination effects** as a result of these two developments being undertaken simultaneously. In terms of general ecology, cumulative effects may arise from habitat fragmentation, increased noise, and disturbance to roadside vegetation and fauna. Effects are | | | |

[12] Chapter 21 – Cumulative Impacts, Bray Public Transport Improvement Scheme (2023). Available at: https://brayscheme.ie/wp-content/uploads/sites/11/2023/07/Chapter-21-Cumulative-Impacts-1.pdf

| Planning Reference | Planning Authority | Status | Location |
|---|---|---|---|
| considered likely to be temporary and localised owing to the nature of the works, and not considered to have capacity to work synergistically with potential effects of this project to produce significant adverse effects on the environment. | | | |
| **2460108 / ABP-310615-21** | **Galway City Council** | **In Appeal** | **Lough Atalia Road** |
| **Development Description**<br>*Permission for development which consists of the demolition of (a) the vacant industrial structure (115 sq m) (b) the external canopy structure (170 sq m) and (c) the boundary walls along the southern, western and north-western boundaries of the site; and the construction of a 15 No. storey Hotel.*<br>**Potential for In-combination effects**<br>The NIS produced for this application identified a hydrological pathway between the site and Galway Bay Complex SAC and Inner Galway Bay SPA, via which runoff of construction-related pollutants could lead to water quality deterioration. A suite of surface water protection and pollution prevention mitigation measures are subsequently outlined within the report, which concludes that there is no potential for significant effects on either European site following the implementation of mitigation, as no water will exit the site carrying pollutants. In addition, it is considered that this project may result in loss of ruderal habitats and disturbance to nesting birds or urban mammals. However, effects are expected to be minor, localized, and not significant in combination.<br>The above, in tandem with the mitigation measures outlined within this NIS Report, are deemed sufficient to ensure there is **no potential for significant in-combination effects** as a result of these two developments being undertaken simultaneously. | | | |
| **ABP/ACP Ref. PA0033** | **An Coimisiún Pleanála (formerly An Bord Pleanála)** | **In Progress** | **Galway Harbour** |
| **Development Description**<br>*Development of an extension of Galway Harbour at Renmore and Townparks Townlands.*<br>**Potential for In-combination effects**<br>Cumulative effects may arise from increased human activity, noise, and indirect pressure on coastal habitats and species. However, the Proposed Development is not expected to materially add to the impacts that already exist at this location.<br>The NIS for this planning application concluded that there would be significant impacts on certain QI habitats/species within the *Galway Bay Complex SAC*, including intertidal and stony bank habitats, and the application is currently at Stage 4 (IROPI) of the AA procedure.<br>Despite this, it is envisaged that the Proposed Development at Galway Port will not have any significant in-combination impacts (above the baseline produced by this planning application) on any QI habitat/species with the planning application PA61.PA0033. | | | |

While the above table assesses each project individually, the below text provides an assessment of potential cumulative effects of this project and all projects identified in the table above, within the vicinity of the site.

Based on the available information and mitigation measures proposed for each project, the cumulative effects of the Proposed Development on biodiversity are not considered significant. While minor, localised impacts may occur in relation to habitat loss, disturbance, and urbanisation, these are unlikely to result in adverse effects on biodiversity receptors when

considered in combination with other developments in the vicinity, the already highly urbanised nature of Galway City and existing land use/activities at Galway Harbour and Renmore and Parks townlands.

In addition, the cumulative assessment that is presented in this chapter is informed by the list of existing, permitted, and proposed developments outlined in Chapter 2 (Description of the Proposed Development) of this EIAR, which should be referred to for full details.

#### *5.5.3.1 Relevant Policies and Plans*

The local policies and plans were reviewed and considered for possible in-combination effects with the Proposed Development. The Galway City Development Plan 2023-2029 has directly addressed the protection of ecologically sensitive habitats, including European sites through specific policy objectives. These policies require that no new development will give rise to significant effects on any European sites, either individually or in-combination with other plans or projects (except in the rare cases where imperative reasons of overriding public interest exist). In this case, protection is also considered to extend to other designated sites within Galway Bay (I-WeBS, Ramsar, and IBA sites) owing to the boundary overlap that exists between the European sites and these other designated sites.

Additionally, the Galway City Biodiversity Action Plan sets out to protect and improve biodiversity and thus will not result in negative in-combination effects with the Proposed Development. Therefore, no in-combination effects are expected with the relevant policies and plans.

#### *5.5.3.2 Operation of Mutton Island (Galway City) WwTP*

Foul water during the operational phase will discharge into Galway Bay via the WwTP on Mutton Island. Mutton Island Wastewater Treatment Plant (WwTP), which is located approximately 1.6 kilometres (km) to the southwest of the site in Galway Bay serving the entire catchment area of Galway city and its environs. This design, build and operate (DBO) project saw Irish Water engage Murphy to refurbish the existing plant and deliver an expansion in capacity from a population equivalent 91,600 to 170,000 followed by a 20-year operation and maintenance period. Mutton Island Wastewater Treatment Plant uses anaerobic digestion to renewable energy from organic waste and this project also entailed the installation of new combined heat and power (CHP) units to harness the biogas produced to power the operation of the plant. The original plant was constructed and commissioned by Murphy in 2003 and had been operated and maintained by Murphy since it entered service. As a result, Mutton Island WwTP has capacity (current load total of 103,000, capacity load total 170,000 population equivalent (pe)[13]) available to accommodate the Proposed Development's foul drainage. In addition, the Annual Environmental Report (2024) for this WwTP shows that the plant is currently in compliance with its emission limit values (ELVs). As such foul water impacts can be ruled out and are not discussed further within this Report.

According to the information contained within the Civil Works Design Report (TOBIN, 2025), which is provided under separate cover:

[13] Chapter 9: Environment and Infrastructure | Galway City Council Online Consultation Portal

*"The proposed wastewater network for the development will operate via gravity discharge to an existing combined sewer located at the north-west corner of the site. The foul sewer system has been designed using Causeway Flow software and is illustrated in drawing no. 11910-2002. A pre-connection enquiry for wastewater discharge from 400 residential units was submitted to Uisce Éireann, which confirmed the feasibility of the connection, this confirmation is included in Appendix D of the Civil Works Design Report. All foul sewer designs will be reviewed and approved by Uisce Éireann before a formal connection offer is issued. In line with Section 3.6 of Uisce Éireann's Code of Practice for Wastewater Infrastructure (UE-CDS-5030-03), the dry weather flow (DWF) is calculated at 450 litres per dwelling, equating to 2.7 population equivalent (P.E.) per unit, including a 10% infiltration rate. The pipework, also designed using Causeway Flow, will consist of thermoplastic structured wall pipes with a maximum diameter of 225mm and gradients ranging from 1/60 to 1/200. Flow velocities within the network comply with the required range of greater than 0.75 m/s (self-cleansing velocity) and less than 2.5 m/s. Overall, no significant cumulative impacts are anticipated from the operation of the Mutton Island Wastewater Treatment Plant in conjunction with the proposed development".*

### 5.5.4 "Do Nothing" Effect

The site is currently heavily urbanised and used for storage purposes. If the proposed works were not to go ahead, the site would likely continue on in its current use, which provides very limited ecological value. The invasive species present near the site (Sycamore) could have some potential to spread, although limited (due to lack of exposed ground/soil on site) and spread might be slow, while some plants considered to be 'weed' species could also appear in cracks in the existing hard standing areas, and areas that receive less footfall, but this would be minimal. The overall character of this area would not be expected to undergo significant change should the Proposed Development not go ahead.

## 5.6 Avoidance, Enhancement, Best Practice and Mitigation Measures

### 5.6.1 Avoidance by Design (Embedded Mitigations)

Embedded measures incorporated as a component of the design of the Proposed Development which will have a secondary effect of preventing significant effects on the ecology of the site and surrounds, including protected designated sites, are described below.

These include the application of standardised international best practice measures as outlined in the accompanying Construction Environment Management Plan (CEMP), and the inclusion of Sustainable Drainage Systems (SuDS) as part of the overall design of the operational phase of the proposal. The operational phase will also include a Lighting Plan.

#### *5.6.1.1 Building Specifications to Reduce Collision Risk Impact*

The following specifications are embedded into the design of the project which serve to further reduce collision risk impact on bird species which may be using the greater Galway Bay area for commuting/foraging.

##### *5.6.1.1.1 Building Appearance*

Whilst the design of the facades of the buildings do include windows, as shown on the elevation drawings prepared by Altu Architects (2025), for the Proposed Development no large continuous

surfaces of glass are proposed. Rather the overall façades of the proposed buildings are well broken up, with a varied material composition interspersing any reflective areas.

These architectural design features provide important visible cues as to the presence and extent of the proposed structures to any commuting/foraging bird species should they be in the vicinity of the site. This overall visual heterogeneity of the building façades will be sufficient to further ensure that the risk of bird collisions as a result of the Proposed Development is negligible. These architectural design features are part of the overall design of the Proposed Development and are not considered to represent specific mitigation measures to prevent collisions, however, they will contribute to the overall effect in this regard. It is noted that birds are not deemed to be at any particular risk of collisions with the proposed buildings at the site.

As such, based on the physical appearance of the Proposed structures and the nature of their location, it is deemed that birds including any 'at-risk' species, do not have the potential to be significantly impacted by the Proposed Development in terms of collisions and the risk is therefore deemed to be imperceptible in the absence of any mitigation.

#### *5.6.1.1.2 Building Height*

In Galway City, bird species that are present are considered to navigate the urban environment with built structures daily.

To put some context on some of their avoidance capabilities, in a different setting and for use in collision risk modelling for onshore wind turbines, an avoidance rate of 99.5% is applied for large gull species and an avoidance rate of 99.2% is applied for small gull species (Furness, 2019), which essentially means that 99.5% and 99.2% of gull flights, respectively, will avoid collision with a moving turbine. For Curlew, the avoidance rate applied is 98% (SNH, 2018).

The risk of collision is even less with a static, clearly detectable building. The proposed buildings consist of glazing, broken up with a varied material composition interspersing any reflective areas. While the presence of the Proposed Development might alter flight patterns of bird species slightly to avoid the proposed building structures the risk of collision is extremely low.

The Proposed Development entails the construction of relatively low-level residential buildings ranging in height from 6-13 storeys, and as such, the risk of migrating birds colliding with any structure due to its height is deemed to be negligible. Migrating species tend to commute far above this height with Swans and Geese flying up to 2500ft (ca.750m) during migration along Irish Coasts (Irish Aviation Authority, 2020).

It is considered that birds that fly over the site to commute between feeding grounds at various locations would fly lower than this, however, once the proposed structures are made of visible materials i.e., not entirely comprised of continuous reflective materials such as glass, the birds would simply fly around or over them.

As such, flightline/collision risk impacts on bird species present at the site, Galway Bay and wider surrounds, are not expected to occur.

#### *5.6.1.2 Construction Environmental Management Plan (CEMP)*

As per the accompanying CEMP (DNV, 2025c), several best practice measures will be adopted during construction. Relevant information below has been extracted from the CEMP[14].

Construction Lighting

Construction work will generally be confined to daylight hours and lighting will generally not be required for the construction phase. There will, however, be occasions where the provision of portable lighting will be required (works on roadways, winter months, and power floating floors as examples). Where possible and without jeopardising site safety lights will be pointed down at a 45-degree angle and away from sensitive receptors. The site compound will have external lights for safety and security. These lights will be pointed down at a 45- degree angle and away from sensitive receptors where possible.

Air Quality

To ensure effects of dust are minimised the following will be implemented:

- Complaint registers will be kept detailing all telephone calls and letters of complaint received in connection with construction activities, together with details of any remedial actions carried out;
- Equipment and vehicles used on site will be in good condition such that emissions from diesel engines etc. are not excessive; and
- Pre-start checks will be carried out on equipment to ensure they are operating efficiently and that emission controls installed as part of the equipment are functional.

Dust will be monitored via the following:

- The dust deposition rate will be measured by positioning Bergerhoff Dust Deposit Gauges at strategic locations near the boundaries of the site for a period of 30 (+/- 2) days if required. Monitoring will be conducted as required during periods when the highest levels of dust are expected to be generated i.e., during site preparation works and soil stripping activities.
- The exact locations will be determined after consideration of the requirements of Method VDI 2119 with respect to the location of the samplers relative to obstructions, height above ground and sample collection and analysis procedures.
- After each 30 (+/- 2 days) exposure period, the gauges will be removed from the sampling location, sealed and the dust deposits in each gauge will be determined gravimetrically by an accredited laboratory and expressed as a dust deposition rate in mg/m2 /day in accordance with the relevant standards.
- Technical monitoring reports detailing all measurement results, methodologies and assessment of results shall be subsequently prepared and maintained by the site Manager.

[14] Please note the CEMP is not considered embedded mitigation itself, this section merely highlights sections which have been included in the CEMP as standard best practice during the design phase.

During excavation, the following will be implemented:

- During dry and windy periods, and when there is a likelihood of dust nuisance, watering shall be conducted to ensure moisture content of materials being moved is high enough to increase the stability of the soil and thus suppress dust,
- During periods of very high winds (gales), activities likely to generate significant dust emissions will be postponed until the gale has subsided.
- The movement of trucks containing materials with a potential for dust generation to an offsite location will be enclosed or covered.

Concrete Run-off

No wash-down or wash-out of ready-mix concrete vehicles during the construction works will be carried out at the site within 10 meters of an existing surface water drainage point. Concrete shut Wash-outs will only be allowed to take place in designated areas with an impervious surface. No barrel washouts will be allowed onsite.

Chemicals on Site

No bulk chemicals will be stored within the active construction areas. Temporary oil and fuel storage tanks will be kept in the material storage area in suitable containers and will be appropriately bunded as required. Refuelling of vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in designated areas of the site, where possible, which will be kept away from surface water drains.

Spill protection equipment such as absorbent mats, socks and sand will be available to be used in the event of an accidental release during refuelling. Training will be given to appropriate site workers in how to manage a spill event.

The following mitigation measures will be taken at the construction site in order to prevent any spillages to ground of fuels during machinery activities and prevent any resulting soil and/or groundwater quality impacts:

- Refuelling will be undertaken off site where possible,
- Where mobile fuel bowsers are used the following measures will be taken:
    - Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use:
    - The pump or valve will be fitted with a lock and will be secured when not in use,
    - All bowsers will carry a spill kit,
    - Operatives will have spill response training; and
    - Portable generators or similar fuel containing equipment will be placed on suitable drip trays.

#### *5.6.1.3 Surface Water Management*

Surface water discharge rates from the proposed surface water drainage network will be controlled by the below proposed embedded measures (construction phase embedded measures are covered in the aforementioned CEMP), which have the capacity to provide attenuation on the surface water run-off rates from the Site, thereby reducing run-off rates from surface water on Site during its operational phase, and further mitigating the risk of surface water overflow during excessive rainfall/flooding events:

- SuDs measures.
- Interceptors.
- 2 no. Attenuation Tank.

It should also be noted that Surface water at the Proposed Development will discharge into the existing public stormwater network.

#### *5.6.1.3.1 SuDS*

The following paragraph summarises SuDS information for the Proposed Development, provided under separate cover in the Civil Works Design Report. These SuDs measures have been embedded into the design of the proposal (TOBIN, 2025):

> *"The surface water drainage strategy for the proposed development will follow the principles of Sustainable Urban Drainage Systems (SuDS), as outlined in the Greater Dublin Strategic Drainage Study (GDSDS). This approach aims to replicate the natural runoff characteristics of the existing brownfield site and minimise the environmental impact of urbanisation. The GDSDS sets out specific drainage criteria to ensure sustainability, including the use of interception, treatment, attenuation, and long-term storage. For this site, interception and attenuation storage will be provided through infiltration tanks with calculated holding volumes. Treatment and long-term storage are not required, as the design avoids applying growth factors to the allowable discharge for the 100-year storm event. All SuDS measures will be developed in line with the EPA's 2011 guidance on discharges to groundwater. The proposed SuDS features include water butts, rain gardens, swales, tree pits, permeable paving, and drainage kerbs with infiltration trenches or filter strips. These elements are intended to achieve interception storage, while discharge soakaways are sized conservatively to account for any seasonal variability in performance. The overall SuDS strategy is designed to meet four key objectives: improving water quality, managing water quantity, enhancing amenity, and supporting biodiversity".*

#### *5.6.1.3.2 Foul Water Drainage*

The proposed wastewater network will use gravity flow to connect to an existing combined sewer, directing foul water to the Mutton Island Wastewater Treatment Plant (WwTP), located 1.6 km southwest of the site in Galway Bay. The plant, originally built in 2003 and operated by Murphy, was recently upgraded under a design-build-operate (DBO) contract to increase its capacity from 91,600 to 170,000 population equivalent (PE). It currently operates at 103,000 PE, leaving sufficient capacity for the Proposed Development. The plant uses anaerobic digestion and combined heat and power (CHP) units to generate renewable energy from biogas. According to the 2024 Annual Environmental Report, the plant complies with emission limits, so no further mitigation measures are required for foul water impacts.

### *5.6.1.4 Lighting Plan*

The public Lighting Design plan (Axiseng, 2025) adopts a wildlife-sensitive approach by utilizing LED fixtures mounted on columns under 8 meters in height, emitting warm light with a colour temperature below 2700K, and limiting light spill along the eastern boundary near the water to approximately 1 LUX. This combination is particularly beneficial to nocturnal species, including bats and small mammals, as it minimizes disruption to their natural behaviours.

LEDs offer precise directional control, reducing unnecessary light scatter and helping preserve dark corridors essential for safe foraging and movement. The lower column height ensures that light remains close to the ground, avoiding illumination of tree canopies and flight paths used by bats.

Warm lighting (<2700K) emits less blue light, which is known to interfere with circadian rhythms and can disorient both nocturnal mammals and birds. For birds, especially migratory species, this is crucial, as artificial lighting can cause fatal disorientation, disrupt navigation, and increase the risk of collisions. By maintaining light spill at just 1 LUX along the sensitive eastern boundary that runs contiguous to Galway Bay, the design protects adjacent aquatic and riparian habitats, which are vital to bird species for both resting and feeding. This low-level illumination helps maintain the natural darkness required by many bird species for roosting and by mammals for undisturbed nocturnal activity.

Overall, the lighting strategy supports biodiversity, reduces ecological disturbance, and aligns with best practices (such as BCT Guidelines) for environmentally responsible outdoor lighting.

### 5.6.2 Best Practice - Mitigation by Design (Embedded) Measures

The following mitigation measures which are considered best practice for completing the construction phase element of proposed developments, and as such have been embedded into the Proposed Development design.

#### *5.6.2.1 Mitigation 1: Construction phase Best Practice*

##### *5.6.2.1.1 Construction phase Best Practice*

The following measures, designed to protect surface water quality, will serve to prevent any negative effects occurring in the adjacent Galway Bay and Lough Atalia as a result of construction phase groundwater discharges from the Site. These mitigation measures will treat the source (e.g., refuelling of plant to be carried out at designated refuelling station locations on Site) or remove the pathway (e.g., no release of wastewater generated on-Site to ground during the construction phase).

All works carried out as part of the Proposed Development will comply with all Statutory Legislation including the Local Government (Water Pollution) acts, 1977 and 1990. Personnel working on the Site will be trained in the implementation of environmental control and emergency procedures. Procedures and relevant documents produced will be formulated in consideration of standard best international practice including but not limited to:

- CIRIA, (2001), Control of Water Pollution from Construction sites, Guidance for Consultants and Contractors;
- Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on Site (C650), 2005;
- BPGCS005, Oil Storage Guidelines;
- UK Pollution Prevention Guidelines (PPG) UK Environment Agency, 2004;
- Construction Industry Research and Information Association CIRIA C648: Control of water pollution from linear construction projects: Technical guidance (Murnane et al. 2006);
- CIRIA C648: Control of water pollution from linear construction projects: Site guide (Murnane et al. 2006); and

- Inland Fisheries Ireland (2016). Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters.

In addition, standard best practice measures will be adhered to throughout the construction phase to ensure no construction-related pollutants are discharged into the surface water or groundwater at and surrounding the Site, which could subsequently be transferred by same to the adjacent Galway Bay and Lough Atalia. Standard best practice measures that will be implemented on the site during the construction phase are as follows:

- Silt fencing will be used along the water boundary.
- Any drains or sewers, where present, which could act as pathways for contamination from the Site will be blocked where required.
- Location of stilling/settling ponds will take into account groundwater vulnerability at the site and will be located in suitable areas and at distance from the water's edge.
- Discharge water generated during placement of concrete will be stored and removed off Site for treatment and disposal.
- There will be no washing out of any concrete trucks on Site. Any washing of chutes will be carefully collected in a designated container which will be subsequently sent off site for compliant waste management.
- Specific areas for storage, delivery, loading/unloading of materials will be designated, which will have appropriate containment/spill protection measures where required. These storage areas will be located in suitable areas and at distance from any watercourses hydrologically connected to nearby designated sites.
- Leachate generation from stockpiles or waste receptacles will be prevented by using waterproof covers.
- Prolonged exposure of contaminated soils or groundwater to the atmosphere will be avoided where practical or unnecessary.
- Appropriate bunding, storage and signage arrangements for all deleterious substances will be used.
- Robust and appropriate Spill Response Plan and Environmental Emergency Plans will be included within the Contractor's CEMP and the details of which will be communicated, resourced and implemented for the duration of the works.
- Control measures and spill clean-up equipment adequate to treat spills at the Site will be available and staff will be trained and experienced in using said equipment.
- A register will be kept of all hazardous substances either used on Site or expected to be present. The register shall be available at all times and shall include as a minimum: valid safety sheets; Health & Safety, environmental controls to be implemented when storing, handling, using and in the event of spillage of materials; emergency response procedures/precautions for each material; the Personal Protective Equipment (PPE) required when using the material.
- All existing services will be mapped, and a plan will be put in place to decommission/divert and manage any drains or sewers which are associated with the Site.
- A plan for dealing with any unknown drains or services which may be encountered during the works will be set out and implemented.
- Any surface water inflow into the main areas of excavation will be minimised where possible.

#### *5.6.2.1.2 Maintenance of Plant and Machinery*

- All plant and equipment will be regularly cleaned and properly maintained.
- There will be no washing out of any concrete trucks on Site.
- Pumped concrete will be monitored to ensure there is no accidental discharge and will be carried out in dry weather and with impermeable pouring mats laid down where possible.

#### *5.6.2.1.3 Building/Road Network and Services*

- Constructing buildings and roads above flood level to ensure that backflows through the surface water outfalls will not occur.
- The Proposed Development's road network will be finished with tarmac or asphalt surface which will discharge runoff to a piped drainage system, and surface water drains will be installed in roads and streets and in pre-determined wayleaves adjacent to building structures.
- All car parking and refuel areas at the site will be located on substrate underlain with an impermeable liner to prevent contaminant leaching to groundwater.

#### *5.6.2.1.4 Earthworks Mitigation*

The proposed earthworks mitigation measures for both the construction phase includes:

- A street sweeper will attend Site regularly to clean the road when there are truck movements in and out of the Site.
- Hard surface roads will be regularly swept to remove mud and aggregate materials from their surface;
- Public roads outside the Site will be regularly inspected for cleanliness, and cleaned as necessary;
- Material handling systems and Site stockpiling of materials will be designed and laid out to minimise exposure to wind; and
- Water misting or sprays will be used on stockpiles as required if particularly dusty activities are necessary during dry or windy periods.

#### *5.6.2.1.5 Storage and Use of Fuels, Oils, and Chemicals*

- Appropriate bunding, storage and signage arrangements for all deleterious substances (e.g., fuels, oils, and chemicals) will be used.
- Fuels, lubricants, and hydraulic fluids for equipment used on the construction Site will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best codes of practice (Enterprise Ireland BPGCS005).
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the Site for disposal or recycling.
- Diesel tanks, used to store fuel for the various items of machinery, will be self-contained and double-walled.
- Potential spillage and leaks of oil from cars parked on the site during the construction phase are unavoidable. To reduce the potential impacts, oil interceptors will be incorporated into the Site drainage design.

- Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the Site and properly disposed of.
- Refuelling will be carried out from tanks or delivery vehicles on a designated impermeable surface and will not be left unattended.
- Plant will not be left running when not in use (i.e., no idling) and plant with dust arrestment equipment will be used where practical.

#### *5.6.2.1.6 Spill/Emergency Response Plans*

- Robust and appropriate Spill Response Plan and Site Environmental Emergency Plans (SEP) will be implemented for the duration of the works:
    - Identifying fuel storage and refuelling locations on designated areas within the compound, away from drainage ditches/waterbodies (where present), and on substrate underlain with an impermeable liner to prevent contaminant leaching to groundwater;
    - Identifying spill kit locations (spill kits will be required for each piece of heavy equipment (e.g., excavators, loaders, trucks, etc.,) which will be at least 21L drum size each with spill pads, sorbent, small boom, plastic rubbish bag and gloves;
    - A specially trained and dedicated Environmental and Emergency Spill Response team will be appointed before the commencement of works on Site.
    - Staff will be trained and experienced in using appropriate control measures and spill kits on-Site and will be familiar with the location of all spill kit locations and the Site layout.
- A register will be kept of all hazardous substances either used on Site or expected to be present. The register shall be available at all times and shall include as a minimum:
    - Valid safety sheets; Health & Safety, environmental controls to be implemented when storing, handling, using and in the event of spillage of materials;
    - Emergency response procedures/precautions for each material;
    - PPE is required when using the material.

#### *5.6.2.1.7 Waste Management and Disposal*

Waste management and disposal will comprise the following:

- All existing services will be mapped, and a plan will be put in place to decommission/divert and manage any drains or sewers which are associated with the Site.
- Portaloos and/or containerised toilets and welfare units will be used to provide facilities for Site personnel. All associated waste will be removed from the Proposed Development Site by a licenced waste disposal contractor.
- Mixer washings are not to be discharged into ground or drainage ditches and will be collected and disposed of at a suitably licenced facility.

In addition, a minimal waste approach of reduction, reuse and recycling will be utilized where practicable/appropriate. Where this cannot be carried out, all wastes will be disposed of at licenced waste facilities.

#### *5.6.2.2 Mitigation 2: Air Quality Control (Dust Reduction)*

In addition to the embedded design measures detailed in Section 5.6.2 above, in order to protect the surrounding waters and habitats/species therein from dust deposition during earthworks, the following mitigation measures are proposed and included in the accompanying CEMP (DNV, 2025b):

- Dust generation will be controlled through proper placement of stockpiles away from sensitive receptors and taking note of the prevailing wind direction.
- In situations where the source of dust is within 25m of sensitive receptors screens (permeable or semi-permeable) will be erected.
- Stockpiles will be located in sheltered parts of the Site and watered where required.
- Staff will monitor dust levels during working hours.
- Bowsers will be available during dry periods for surface watering to keep unpaved areas moist.
- Any dust emitting works will be postponed during high winds (gales) until winds have subsided.
- Vehicles delivering material will be covered to prevent the escape of dust.
- A wheel washing facility will be installed near the Site compound for use by vehicles exiting the Site.
- Dust deposition rate will be measured by Bergerhoff Dust Deposit Gauges situated in strategic locations in the Site including boundary vegetation, if required.
- Results will be quantified in a lab after 30 days and monitoring reports prepared by the relevantly qualified person.
- A limit of 350mg/m$^2$ per day will be adhered to.

#### *5.6.2.3 Mitigation 3: Reduction of Noise Related Impacts*

Bird species are sensitive to disturbance from increased noise as a result of the construction phase of the Proposed Development. Otter is similarly susceptible to noise disturbance.

Mitigation to reduce the effects of noise during the construction phase (including human presence, plant, machinery and vehicles) is required to avoid significant adverse effects on the birds present on the Site, and on waterbirds associated with Galway Bay and Lough Atalia and is as follows:

- High noise disturbance works (such as demolition and heavy drilling) shall be undertaken between April and September, where practicable, to avoid most sensitive time for wintering birds.
- Minimise/avoid any working time outside of the designated area (in this instance the site boundary) within the Proposed Development site.
- Acoustic barriers shall be installed along the entire length of the eastern boundary of the Site.
- Acoustic barriers shall be opaque so as to additionally reduce visual disturbance. As per Cutts et al (2013), the removal of the majority of visual stimuli in combination with the reduction in noise levels will decrease overall disturbance to waterbirds that may be using Galway Bay or Lough Atalia to ‘Low level disturbance’. This is defined as “*Works that are out of sight of birds and create a low-level noise,” and*

*"Noise of 55-72dB in a highly disturbed environment",* both of which will be achieved by the installation of the opaque acoustic barriers.

- Selection of plant machinery with low inherent potential for generating noise.
- Siting of plant as far away from sensitive receptors as permitted by Site constraints.
- Avoidance of unnecessary revving of engines and switch off plant items when not required.
- Keep plant machinery and vehicles adequately maintained and serviced.
- Proper balancing of plant items with rotating parts.
- Keep internal routes well maintained and avoid steep gradients.
- Minimise drop heights for materials or ensure a resilient material underlies.

The above has been compiled with reference made to Goodship, N.M & Furness, R.W (2022) and Ruddock, M. & Whitfield, D.P (2007), please see the Reference section below for further details.

Acoustic barriers are readily available online and have the benefit of reducing noise levels by up to 43dB. Noise levels at the Site in conjunction with bird species and otter present will be monitored regularly by a suitably qualified ecologist to ensure the effectiveness of the measures described above. Monitoring is discussed in more detail in Section 5.7 below. Where works are occurring outside of the wintering bird sensitive season (April to September), monitoring is not required. Acoustic barriers shall remain in place for the duration of construction activity.

In addition to the above, mitigation measures for noise and vibration impacts are also provided for in Section 10.6.1.3 of this EIAR.

#### *5.6.2.4 Mitigation 4: General Site Tidiness*

The following general avoidance measures will be incorporated to minimise impacts to mammals that may traverse the Site during the construction phase:

**Hours of work**

The hours of working will be limited to daylight hours where possible, so as to limit disturbance to nocturnal and crepuscular animals.

**Waste management**

As best practice, all construction-related rubbish on Site e.g., plastic sheeting, waste, wires, bags, netting in which animals can become entangled etc. will be kept in a designated area and kept off ground level so as to prevent small mammals or reptiles from entrapment and death.

**Excavations and Pipes**

Trenches/pits will be either covered when not in use/at the end of each working day with caps (especially at night) or include a means of escape for any animal falling in and getting stuck. If this is not possible, then a strategically placed plank or object will be placed in the corner of an excavation to enable animals to safely escape.

Any temporarily exposed open pipe system will be capped in such a way as to prevent fauna from gaining access as may happen when contractors are off-site.

#### *5.6.2.5 Mitigation 5: Construction phase Lighting Regime*

To minimise ecological disturbance during the construction phase, lighting will be managed with a strong emphasis on environmental sensitivity. Where possible, all construction lighting will be switched off during non-working hours to reduce unnecessary illumination of the surrounding environment (CIEEM, n.d.).

When lighting is required, directional lighting will be the preferred method. This approach significantly reduces light spill beyond the immediate work area, thereby limiting potential disruption to nearby habitats. This is particularly important for nocturnal mammals, bats, and marine or aquatic species that may be using the site or adjacent areas for commuting, foraging, or other essential behaviours. These species are often highly sensitive to artificial lighting, which can interfere with their natural activity patterns and ecological functions (IEMA, n.d.).

To further mitigate impacts, it is recommended that LED luminaires with a warm white spectrum (2700K–3000K) be utilised. This spectrum reduces the blue light component, which is known to be more disruptive to wildlife. LED lighting is also advantageous due to its sharp cut-off angles, lower intensity, and dimming capabilities, all of which contribute to minimising light pollution and ecological disturbance (Amos Lighting + Home, n.d.).

In addition, wooden hoarding will be installed along the perimeter of the site to provide visual screening to protected species such as otter, who are present in the vicinity and may be sensitive to the increased human presence and activities during the construction phase (CIEEM, n.d.).

These measures are intended to support the protection and conservation of local biodiversity, ensuring that construction activities are carried out in a manner that is both responsible and environmentally conscious.

#### *5.6.2.6 Mitigation 6: Ecological Clerk of Works (ECoW)*

Prior to the commencement of any works, an Ecological Clerk of Works (ECoW) shall be appointed.

The role of the ECoW is to ensure there is no light spillage from the Site during construction in the later hours of the working day during winter, and to check the acoustic/screening barrier functionality. This will serve to further mitigate against potential disturbance noise/visual impacts. The ECoW will also be responsible for ensuring that no species such as otter are using the Site and are entrapped within any pipes/machinery.

### 5.6.3 Operational Phase Mitigation Measures

#### *5.6.3.1 Recommendation 7: Artificial Lighting*

The Proposed Development will result in a shift from the current baseline lighting conditions on-Site, as the area is presently largely disused and experiences minimal maintenance and artificial illumination. Given the ecological sensitivity of the Site and its surroundings, particularly for bats, nocturnal mammals, and species associated with the nearby Galway Bay waterfront, such as seals, otters, and waterbirds, a comprehensive lighting mitigation strategy has been developed to ensure that no significant adverse effects occur.

To address these concerns, a bat-friendly lighting plan is proposed by DNV for incorporation into the operation phase internal lighting design (*ILP & BCT Guidance Note GN08/23)*. This plan will be designed to minimise light spill and glare, thereby protecting light-sensitive species that may be commuting, foraging, or roosting within or near the Site. The lighting strategy therefore considers three primary sources of potential light emissions:

- Internal lighting from proposed buildings
- Public lighting associated with development works
- External lighting sources, such as vehicle headlights on Milltown Road

**Internal Lighting Mitigation**

Although internal lighting is not expected to significantly impact commuting or foraging bats, given that buildings are largely presented around or fronting the sites boundary with open space centrally located, and potential bat activity, although considered unlikely, is considered to be concentrated along boundary vegetation and adjacent shoreline, specific measures will be implemented to further reduce potential light spill:

- Recessed lighting fixtures will be used, particularly in units facing buffer zones.
- Lighting in communal spaces near windows will be reduced or avoided, especially in areas overlooking sensitive habitats.
- Warm-white or amber LEDs (≤2700K) will be used to reduce blue light emissions.
- Full cut-off fixtures will be installed to prevent upward or outward light spill.
- Avoid uplighting and floodlighting.
    - No architectural lighting will illuminate trees, water surfaces, or skyward.
- Common Areas: Avoid/reduce lighting near windows that overlook the watercourse.
- Motion sensors and timers will ensure lighting is only active when necessary.
- Façade and balcony lighting will be low-intensity, shielded, and sensor-controlled.
- Ecological zoning will treat areas adjacent to the watercourse as Zone E1 (Intrinsically Dark), with light levels kept below 1 lux (ILP, 2021).

**Public Lighting Mitigation**

The public lighting design, as detailed in the Lighting Report and Drawings Veelite Lighting Ltd (2025), incorporates several mitigation measures to reduce ecological disturbance:

- Lighting shall be directed away from sensitive ecological areas/receptors, specifically it shall be directed away from the waters and Lough Atalia.
- Light spill outside of the Site's boundaries shall be minimised;
    - Light spill along the eastern boundary (by the water) will be limited to approximately 1 LUX.
- The lighting design is based on the use of LED lighting which has minimal or no UV output of significance. Warmer 2700°K LED lighting will be utilized for amenity areas,

as the warmer colour temperatures with peak wavelengths greater than 550nm (~3000°K) cause less impacts on bird species. This accounts for;

- The fact that birds are sensitive to shorter wavelengths (blue and UV light) which can disorient migratory birds, leading to collisions with infrastructure or exhaustion, especially at night, when most migrations are considered to occur.
- The fact that warmer LEDs emit less blue light and more light in longer wavelengths (yellow-red spectrum) which is less disruptive to circadian rhythms and navigation.

**External Lighting and Landscape Integration**

To further buffer the Site from external light sources:

- Native planting between the proposed buildings and the Lough Atalia Walk which abuts the waterfront will enhance foraging opportunities for bats and provide visual screening.
- Open spaces will be designed to act as ecological buffers, incorporating the same lighting mitigations as the built areas.
- Landscape design ensures ecological connectivity both within the Site and to the wider urban and natural landscape.

This integrated lighting strategy reflects best practices as recommended by the Institution of Lighting Professionals (ILP) and is tailored to the specific ecological sensitivities of the Site. It ensures that the development proceeds in a manner that is both environmentally responsible and aligned with biodiversity conservation goals.

### 5.6.4 Biodiversity Enhancement Measures

#### *5.6.4.1 Biodiversity Enhancement by Design*

The Landscape Plan incorporates native planting throughout the open green spaces of the Proposed Development. This will take the form of trees, hedgerow, shrubs, grasses and wildflower meadow. The planting schedule is shown in Figure 5-12,and can be found in full in the Landscape Report, along with specifications for plant material, the requirements of the Landscape Contractor and proposals for monitoring establishment of green spaces. The landscaping will offset habitat loss at the Site to an extent, producing an imperceptible net effect on habitats.

#### *5.6.4.2 Enhancement 1: Wildflower Meadows*

The Landscape Plan includes the introduction of wildflower meadows across the Site. All wildflower seeds will be Irish Provenance Certified Seed, from a reputable source such as Design by Nature (Wildflowers.ie). To maximise the biodiversity value of the landscaping at the Site, consideration has been made to the All-Ireland Pollinator Plan planting code (NBDC, 2022).

#### *5.6.4.3 Enhancement 2: Native Hedgerow and Tree Planting*

The proposed planting scheme places a strong emphasis on the use of native hedgerows and trees, which are essential for enhancing local biodiversity, improving ecological connectivity, and contributing to the overall environmental resilience of the Site.

**Native Hedgerows**

The integration of native hedgerows, established using multi-purpose topsoil and bark mulch, will create valuable linear habitats that support a wide range of wildlife. These include nesting birds, small mammals, and pollinating insects such as bees and butterflies. Hedgerows act as ecological corridors, enabling species to move safely across the landscape, which is particularly important in fragmented urban or semi-urban environments.

Native hedgerows also provide natural screening, offering visual privacy and reducing noise pollution from surrounding areas. Their seasonal variation adds aesthetic value and supports year-round ecological functions, including food provision (berries, seeds, nectar) and shelter.

**Native Tree Planting**

The tree planting strategy includes a mix of clear-stemmed and multi-stemmed semi-mature native trees, carefully selected for their adaptability to local soil and climatic conditions. Key species include:

- Alder: A nitrogen-fixing species that thrives in wetter soils and supports a wide range of invertebrates.
- Downy Birch: A pioneer species that enhances soil quality and provides habitat for insects and birds.
- Pedunculate Oak: A keystone species in Irish woodlands, supporting hundreds of insect species and providing acorns for birds and mammals.
- Hawthorn: A dense, thorny shrub ideal for nesting birds, with spring blossoms for pollinators and autumn berries for wildlife.

These trees can contribute significantly to urban greening, offering benefits such as carbon sequestration, urban cooling, and stormwater management. Their presence also helps to visually soften the built environment, creating a more natural and welcoming landscape for both people and wildlife.

In addition to their ecological value, the selected species will enhance the Site's resilience to climate change, improve air quality, and support the long-term sustainability of the Development. The planting design also ensures that these features are integrated into the wider green infrastructure network, maintaining connectivity with adjacent habitats and contributing to a cohesive ecological framework across the Galway Port landscape.

#### *5.6.4.4 Enhancement 3: Hedgerow Management*

Planted trees and hedgerows at the Site will be managed using a low-intervention approach i.e., in a way that maximises the ecological value they provide, with habitat connectivity promoted and maintained along the western, northern and eastern margins of the site; connecting it with the wider area.

This connectivity is vital for wildlife such as birds, bats, mammals and insect pollinators in a human landscape such as that which will be provided by the Proposed Development. Additionally, by managing hedgerows and woodland in a more natural way, they will provide more in terms of biodiversity; through increased plant diversity, increased provision of food resources and higher quality shelter to wildlife inhabiting and commuting through the area.

A low-intervention management approach may not be appropriate for internal ornamental hedgerows planted within the main residential area of the Proposed Development, due to aesthetics or logistics, however, it is suited to the remaining native hedgerows within the Site.

The following measures will be adopted by the Management Company tasked with maintaining the Site's landscaping into the future:

- The hedgerow areas located near the outer boundaries of the Site will, as much as is practicable, be allowed to link up with each other. The provision of an almost continuous vegetative margin around the Site; through planted native hedgerows and trees, will maintain habitat connectivity with the surrounding environment.
- Hedgerows will be maintained with a minimum natural meadow strip of 1-2m at their base wherever possible. Hedges with plenty of naturally occurring flowers and grasses at the base support will provide higher quality habitat for local wildlife using the hedges.
- The 1-2m strip at the base of the hedgerow will be cut on a reduced mowing regime to encourage wildflower growth and maximise the value of the hedgerow for pollinators. A two-cut management approach is ideal for suppressing coarse grasses and encouraging wildflowers. Cut the hedgerow basal strip once during February and March (this is before most verge plants flower and it will not disturb ground-nesting birds). Cut the verge once again during September and October (this slightly later cutting date allows plants that were cut earlier in the year time to grow and set seed).

Raising the cutter bar on the back cut will lower the risk to small mammals.

- Where hedgerow, scrub or tree understorey trimming needs to occur, trimming will be delayed as late as possible – until January and February as the surviving berry crop will provide valuable food for wildlife. The earlier this is cut; the less food will be available to help birds and other wildlife survive through the winter. Any hedgerow/scrub/woodland trimming will be done outside of the nesting season and due consideration of the Wildlife Act 1976 (as amended) will be taken.
- Where possible, these outer boundary hedgerows will be cut on a minimum **3-year cycle** (cutting annually stops the hedgerow flowering and fruiting) and cut in rotation rather than all at once - this will ensure some areas of hedgerow will always flower (blackthorn in March, hawthorn in May etc.).
- Where they occur naturally, bramble and ivy should be allowed to grow in hedgerows as they provide key nectar and pollen sources in summer and autumn.

*Hedgerow Management Methods to Avoid*

Hedgerows and tree understorey will not be over-managed. Tightly cut hedges and vegetation mean there are fewer flowers and berries, thus reducing available habitats, feeding sources and suitable nesting sites.

Hedgerows will not be cut between March 1st and August 31st inclusive. It is both prohibited (except under certain exemptions) and very damaging for birds as this is the period they will have vulnerable nests containing eggs and young birds.

Pesticide/ herbicide sprays or fertilisers will not be used at all as they can have an extremely negative effect on the variety of plants and animals they support.

#### *5.6.4.5 Enhancement 4: Creation of Invertebrate Habitat*

As part of the biodiversity enhancement strategy for the Proposed Development, the integration of bee bricks and bee hotels offers a simple yet highly effective means of supporting urban pollinator populations, particularly solitary bees. These species, which include mason bees and leafcutter bees, do not form hives and instead rely on small cavities in wood, stone, or soil to nest. In urbanised environments, such natural nesting sites are often scarce due to the dominance of hard landscaping and building materials. These will be placed on Site, where applicable, with the placement of same selected by a qualified Ecologist.

By embedding bee bricks directly into the fabric of buildings, such as external walls, garden structures, or boundary features, and installing bee hotels in communal green spaces, balconies, and landscaped areas, the development can provide essential nesting habitat for these important pollinators. These features require minimal space and maintenance, making them a practical addition to both private and public areas within the site.

The ecological benefits are significant. Solitary bees are highly efficient pollinators, contributing to the health and productivity of nearby wildflower meadows, gardens, and planted areas. Their presence enhances plant diversity, supports food webs, and contributes to the overall resilience of urban ecosystems. In turn, this supports other wildlife such as birds and small mammals that rely on flowering plants and insects for food and shelter.

Beyond ecological value, bee bricks and hotels also offer educational and community engagement opportunities. They serve as visible, tangible features that can foster awareness of biodiversity among residents, encouraging environmentally responsible behaviours and a sense of stewardship. Informational signage or community-led monitoring initiatives can further enhance their impact.

From a sustainability perspective, these features align with green building standards such as Building Research Establishment Environmental Assessment Method (BREEAM) and Leadership in Energy and Environmental Design (LEED), which reward biodiversity-friendly design. They also contribute to climate adaptation goals by supporting ecosystem services like pollination, which are vital for urban greening and food production. Guidance from the All -Ireland Pollinator Plan states "*Don't install a large bee or insect hotel. Large bee hotels are attractive to humans, but not great for pollinators. They can encourage the spread of disease and attract predators. Avoid anything bigger than an average-sized bird box. There are many other ways to provide nesting habitats for pollinators, such as providing wild areas of undisturbed long grass, and scraping back some bare earth. If you want to make a bee hotel, make sure it is small, and position it away from bird feeders so the insects aren't easy targets*." A link to a "How-to-guide Creating wild pollinator nesting habitat" is provided for the development management company to put these habitats in place[15]. An appointed ecologist will oversee the creation of these habitats.

In summary, the inclusion of bee bricks and bee hotels within the Proposed Development design represents a low-cost, high-impact intervention that supports biodiversity, enhances ecological connectivity, and contributes to the environmental and social sustainability of the Site.

[15] https://pollinators.ie/wp-content/uploads/2022/12/Pollinator-Nesting-How-to-Guide-2022-WEB.pdf

#### *5.6.4.6 Enhancement 5: Habitat Management Plan*

A habitat management plan for the Site will be developed, in conjunction with a suitably qualified contractor, to ensure longevity and proper maintenance of the proposed enhancement features for the Site. This plan will include, but not be limited to, the following, and will be implemented by the appointed contractor:

- Native Planting Maintenance: Regular care of native hedgerows, trees, wildflower meadows, and green roofs to ensure healthy growth and prevent invasive species.
- Seasonal Pruning: Conduct pruning outside of bird nesting season (typically March–August) and use less intensive measures where possible (e.g., hand tools) to avoid disturbance.
- Deadwood Retention: Leave some deadwood in situ (where safe) to support invertebrates and fungi as trees/hedgerows are pruned.
- Regular Maintenance of SuDS Features: Ensure swales, rain gardens, and attenuation ponds are functioning properly and not overgrown or polluted.
- Biodiversity-Friendly Design: Maintain vegetation around SuDS to attract and support amphibians, insects, and birds.
- Invertebrates: maintain bee bricks/bee hotels as necessary to ensure they remain functional.

#### *5.6.4.7 Enhancement 6: Swift Boxes*

It is proposed to include a minimum of 20 no. swift bricks as part of the Proposed Development. The bricks shall be located in groups of up to 20, as swifts are a social nesting species. As per best practice, swift bricks will be installed at least 5 metres above the ground, in safe areas where they will not be disturbed, with a clear unobstructed run up to the boxes/bricks. As the bricks tend not to overheat, they can be placed facing in any direction. Care will be taken to ensure no obstacles or plate glass windows are located below the bricks.

Guidelines for the bird box scheme follow the guidelines published by Swift Conservation Ireland, and those published by Birdwatch Ireland entitled “Saving Swifts” (2009/2010). The incorporation of Swift Bricks will help recover the declining swift population, which are now Red Listed in Ireland (Gilbert et al., 2021).

Swifts are a “clean” bird species which remove their own wastes from their nests periodically. As such, Swift bricks do not require any cleaning by the management company, however, placement should be cognizant of any non-natural surfaces beneath that may accumulate bird waste or present a health and safety hazard (e.g., placement above outdoor eating areas or paved footpaths).

While not altogether necessary, a **Swift calling system will be installed** to attract Swifts and encourage them to take up residence at a new site. A Swift calling system is a small speaker set-up that plays Swift calls during the summer. It should be located close to the brick entrances and has been seen to greatly increase the chances of Swifts using the Swift boxes/bricks. Solar powered options are possible and advised.

To facilitate installation, an Ecologist will be instructed to set up the Swift calling system once the construction of the Proposed Development is complete.

#### *5.6.4.8 Enhancement 7: Bat Boxes*

A minimum of four summer bat boxes (e.g., Woodcrete 1FF Schwegler design) will be erected on suitably sized trees within the Site, the placement of which will be determined by a bat ecologist. The boxes will be installed as part of the landscaping works, so as to not delay their deployment and potential positive effects.

Bat boxes will be sited carefully, with reference made to Bat Conservation Trust Guidelines[16], and this will be undertaken by a bat specialist. 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 buildings, 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 shall 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.

## 5.7 Monitoring Requirements

### 5.7.1 Construction phase Monitoring

#### *5.7.1.1 Measure 1: Water Quality Protection Measures*

To ensure the continued effectiveness of water quality mitigation measures implemented on-site, weekly inspections and checks will be carried out by a suitably qualified ecologist throughout the operational phase of the development. These routine assessments are essential for identifying any emerging issues, verifying the functionality of installed systems, and maintaining compliance with environmental standards.

The checks will include:

- Visual inspections of water bodies, drainage channels, and Sustainable Drainage Systems (SuDS) features (e.g., attenuation ponds) to detect signs of pollution, sediment build-up, or blockages.
- Testing of water parameters, such as pH, turbidity, dissolved oxygen, and nutrient levels, where applicable, to ensure water remains within acceptable ecological thresholds.
- Verification of mitigation infrastructure, including oil interceptors/filtration systems, to confirm they are operating as intended and have not been compromised by debris or mechanical failure.
- Checks to ensure all best practice guidance outlined in this chapter is being followed.

[16] Putting up your box - Bat Boxes - Bat Conservation Trust

- All surface water/groundwater protection measures will be checked on a weekly basis, and more often during wet weather.
- Documentation and reporting of findings, with any issues flagged for immediate remedial action to prevent deterioration of water quality or harm to aquatic and riparian species.

These weekly checks form part of a broader environmental management plan (CEMP), ensuring that water quality protections remain robust and responsive to changing site conditions. Regular monitoring also supports long-term ecological health and demonstrates a proactive commitment to environmental stewardship.

#### *5.7.1.2 Measure 2: Noise Monitoring and Acoustic Barrier Performance Checks*

To ensure that acoustic barriers installed as part of the development continue to function effectively in mitigating noise impacts, regular noise level checks will be conducted by a suitably qualified ecologist during the operational phase. These checks are essential for maintaining compliance with environmental noise standards and safeguarding the acoustic environment for both residents and surrounding communities.

As per the CEMP, the monitoring process will include:

- Baseline and comparative noise measurements taken at strategic locations near acoustic barriers, residential units, and site boundaries to assess the effectiveness of noise attenuation over time.
- Verification of barrier integrity, including inspections for physical damage, gaps, or deterioration in materials that could compromise acoustic performance.
- Assessment of barrier placement and orientation, ensuring that structures remain correctly positioned and unobstructed by vegetation, debris, or new construction elements.
- Monitoring during peak activity periods, such as high traffic hours or communal area usage, to evaluate real-world performance under varying conditions.
- Documentation and reporting of noise levels, with reference to applicable guidelines (e.g., protected species disturbance levels, local planning conditions, etc.), and identification of any exceedances or anomalies.
- Responsive maintenance protocols, whereby any identified issues with acoustic barriers, such as reduced effectiveness or structural faults, are addressed promptly through repair, replacement, or adjustment.

These measures ensure that acoustic barriers continue to deliver their intended function of minimising noise pollution, enhancing resident comfort, and protecting local wildlife from excessive disturbance.

#### *5.7.1.3 Measure 3: Designation of No Access Zone for Ecologically Sensitive Areas*

It is proposed to establish the designation of no access zones so as to safeguard ecologically sensitive habitats located adjacent to the Development Site, particularly the eastern boundary bordering Galway Bay. These zones are critical for protecting vulnerable coastal and marine ecosystems from disturbance associated with human activity, including noise, light, trampling, and pollution.

Contiguous to the eastern portion of the site lies the shore of Galway Bay and the Lough Atalia inlet/outlet channel, which is of particular ecological importance due to its designated conservation status (SAC and SPA under the EU Habitats Directive), being an area that supports a diverse range of species, including waterbirds, marine mammals, and intertidal flora and fauna. Unregulated access to this area could result in habitat degradation, disturbance to nesting and foraging wildlife, and the introduction of litter or contaminants.

To mitigate these risks, the following actions will be implemented for the duration of the construction phase:

- Clearly defined no-access boundaries will be established using screening and unobtrusive fencing where necessary, to discourage entry without fragmenting the landscape.
- Signage and interpretation panels will be installed to inform site personnel of the ecological sensitivity of the area and the importance of respecting access restrictions to the shore.
- Monitoring and enforcement protocols will be developed to ensure compliance, including periodic site inspections.
- Pathway and circulation design will direct human activity away from the shoreline along the eastern boundary, with alternative routes provided to reduce pressure on sensitive zones.

(Biodiversity Infrastructure Initiative, 2023).

These measures will ensure that the Proposed Development remains compatible with the conservation objectives of Galway Bay and contributes positively to the protection of local biodiversity during the construction phase. The conservation objectives can be viewed in the NIS which is provided in Appendix 5-4 of this EIAR.

#### *5.7.1.4 Measure 4: Dust Control Measures for Ecologically Sensitive Areas*

During the construction phase of the Proposed Development, effective dust control is essential to prevent airborne particulates from migrating off-site and entering Galway Bay, which lies along the eastern (and southeastern) boundary of the Site. Galway Bay is a highly sensitive and protected marine environment, being both a designated Special Area of Conservation (Galway Bay Complex SAC 000268) and a Special Protection Area (Inner Galway Bay SPA 004031), supporting a range of habitats and species, including intertidal communities, waterbirds, and marine mammals. As such, construction-related dust can pose a serious threat to this ecosystem by degrading water quality, smothering vegetation, and introducing pollutants. Degradation of water quality can in turn lead to negative impacts for aquatic species and prey availability.

To mitigate these risks, a comprehensive dust management plan will be implemented, with weekly checks by the contractor forming a core part of the monitoring and compliance strategy. These checks will ensure that all dust suppression measures remain effective and are being properly maintained throughout the construction period (An Bord Pleanála, 2021, TII, 2022, and Government of Ireland, 2022).

Key components of this approach include:

- **Weekly Dust Monitoring and Inspections**

  - Visual assessments of dust-generating activities (e.g. excavation, material handling, vehicle movement) to identify areas of concern.
  - Inspection of dust control equipment, such as water bowsers, misting systems, and wheel-wash stations, to confirm they are operational and used appropriately.
  - Monitoring of weather conditions, particularly wind direction and speed, to anticipate periods of increased dust risk, especially when winds are blowing toward Galway Bay.
  - Use of dust monitoring devices, such as PM10 sensors, to track particulate levels and ensure they remain within acceptable thresholds.
- **Dust Suppression Measures**
  - Regular damping down of exposed soil, stockpiles, and haul roads using water sprays, particularly during dry or windy conditions.
  - Covering of loose materials during transport and storage to prevent wind-blown dust.
  - Minimising drop heights when loading or unloading materials to reduce dust generation.
  - Limiting vehicle speeds on unpaved surfaces to reduce dust lift-off.
  - Stabilisation of stockpiles using temporary coverings or hydroseeding where appropriate.
- **Reporting and Adaptive Management**
  - Weekly reporting of inspection findings, including any exceedances or failures of dust control measures.
  - Immediate corrective actions where dust levels are found to be elevated or mitigation measures are not functioning as intended.
  - Ongoing review and adaptation of dust control strategies based on site conditions, construction progress, and monitoring results.

By implementing these measures and maintaining a proactive monitoring regime, the development will minimise the risk of dust-related impacts on Galway Bay's sensitive marine and coastal ecosystems, ensuring compliance with environmental regulations and contributing to the overall sustainability of the Proposed Development.

## 5.8 Operational Phase Monitoring

### 5.8.1 Measure 5: Post-Construction Lighting Assessment by a Bat Ecologist

Following the completion of the Development, a post-construction lighting assessment will be undertaken by a suitably qualified bat ecologist. This assessment is a critical component of the Site's biodiversity mitigation strategy, ensuring that the installed night-time lighting does not adversely affect local nocturnal species, including local bat populations, particularly in areas that may be important for commuting and foraging activities.

The bat ecologist will conduct a site-wide evaluation of all lighting, including streetlights, building-mounted luminaires, bollard lighting, and any landscape or architectural lighting features. The assessment will have reference to *ILP & BCT Guidance Note GN08/23 – Bat Friendly Lighting*, and will be carried out during the active bat season (typically between April and October) and under suitable weather conditions to ensure accurate observations of bat activity in relation to lighting.

Key elements of the assessment will include:

- Measurement of light levels (lux) at ground level and at canopy height in key sensitive areas, particularly along linear features, treeline/hedgerow edges, and buffer zones adjacent to Galway Bay.
- Identification of light spill or glare into Galway Bay.
- Behavioural observations of bat activity in relation to illuminated areas, using bat detectors and visual surveys, where required, to assess whether lighting is deterring or displacing bat movement.
- Comparison with pre-construction ecological data, including this report, to determine whether lighting has altered bat usage patterns across the Site in any way (positive or negative).

Based on the findings, the ecologist will provide recommendations for remedial action, if necessary. These may include:

- Retrofitting or re-aiming luminaires to reduce light spill into sensitive areas.
- Installing shields, baffles, or louvres on existing lights to direct illumination away from sensitive habitats.
- Adjusting lighting schedules to reduce illumination during peak nocturnal species activity hours (typically dusk to dawn).
- Replacing high-intensity or cool-spectrum lights with warm-white LEDs (≤2700K) to minimise ecological disruption.

The implementation of these recommendations will ensure that the Development remains compliant with wildlife protection legislation and continues to support the long-term conservation of local nocturnal species, including migratory bird and local bat populations.

In addition, a follow-up report documenting the assessment findings and any corrective actions taken will be submitted to the relevant planning authority or ecological oversight body as part of the site's post-construction compliance obligations.

### 5.8.2 Measure 6: Post-Construction Bird Box Assessment by an Ecologist

Bird box placement and installation will be undertaken and overseen by an Ecologist to ensure they are carried out per specifications. Bird boxes will be monitored by the appointed maintenance team and any defects or faults reported to an Ecologist who can supervise the installation of new boxes during the appropriate season (before February).

The bird boxes will require emptying from October onwards, which will help prevent the spread of any parasites or disease between nesting birds and encourage birds to nest in the future breeding season. This task will be done once annually by the appointed maintenance team.

### 5.8.3 Measure 7: Post-Construction Bat Box Assessment by an Ecologist

As with the bird boxes, bat box placement and installation will be undertaken and overseen by an Ecologist to ensure they are carried out per specifications

Bat boxes installed shall be subject to regular monitoring and maintenance to ensure their continued suitability and to promote long-term use by bats. As such, annual inspections are recommended, ideally to be carried out during autumn or winter when bats are less likely to be present, to check for structural integrity, signs of damage, and secure mounting. While bat

boxes typically do not require cleaning, any accumulation of droppings or debris that could obstruct entry or reduce internal space shall be carefully inspected and removed.

Inspections shall also include checks for pest activity, such as wasp or bird nests, which may deter bat use. Vegetation around the box should be managed to maintain clear flight paths (entry/egress), and artificial lighting in the vicinity should be avoided to preserve a dark environment conducive to bat activity. Lighting will be monitored per Measure 5 above.

## 5.9 Summary of Monitoring Requirements

Table 5-19 below provides a summary of the required monitoring and pre-works inspections during the construction phase, as well as any surveys that shall be completed during the operational phase. 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 effects.

The monitoring/surveys outlined below will be included in a Biodiversity Management Plan (BMP) for the Proposed Development, along with the detailed mitigation measures for the construction and operational phases (Section 5.6).

*Table 5-19 Summary of Mitigation Measures and the Responsible Person for Monitoring during the Construction and Operational phases (Green Indicative of items Requiring Ecologist).*

| Measure | Monitoring |
|---|---|
| **CONSTRUCTION PHASE** | |
| Mitigation 1: Water quality protection measures | Weekly checks by ECoW to ensure water quality mitigations remain effective. Designation of no access zones. |
| Mitigation 2: Air quality control | Weekly checks by the contractor to ensure controls remain effective. |
| Mitigation 3: Noise monitoring and acoustic barrier performance checks | Noise level checks by the ECoW to ensure acoustic barriers are functioning correctly once installed |
| Mitigation 4: General site tidiness | No monitoring required. |
| Mitigation 5: Construction phase Lighting | No monitoring required. |
| Mitigation 6: Ecological Clerk of Works | No monitoring required. This role fulfills Ecological monitoring requirements. |
| **OPERATIONAL PHASE** | |
| Mitigation 7: Operational phase Lighting | Post construction lighting assessment by a bat ecologist to be undertaken during operation stage within the bat survey period. |
| **Enhancement Measures** | |
| Enhancement 1: Wildflower Meadows | To be carried out by the contractor per the landscape plan |
| Enhancement 2: Native Hedgerow and Tree Planting | To be carried out by the contractor per the landscape plan |
| Enhancement 3: Hedgerow management (low intervention) | Ongoing monitoring by Management Company |
| Enhancement 4: Creation of Invertebrate Habitats | Placement to be overseen by suitably qualified ecologist post construction phase. Annual checks are |

| Measure | Monitoring |
|---|---|
| | recommended to be carried out by an Ecologist; ensure they remain fit for purpose. |
| Enhancement 5: Habitat Management Plan | Ongoing monitoring/management by Management Company |
| Enhancement 6: Swift Boxes | The placement of swift boxes and setup of swift-calling system should be carried out under supervision of an Ecologist to ensure they are fit for purpose. Annual checks are recommended to be carried out by an Ecologist; ensure they remain fit for purpose. |
| Enhancement 7: Bat Boxes | The placement of bat boxes should be carried out under the supervision of an Ecologist to ensure they are fit for purpose. Annual checks are recommended to be carried out by an Ecologist; ensure they remain fit for purpose. |

## 5.10 Interactions

The full assessment of interactions is provided in Chapter 16 of the EIAR. Outlined below are interactions relevant to Biodiversity. Interactions between Biodiversity and other environmental factors of the EIAR have been identified with the following sections: Hydrology, Landscape, Noise, Material Assets, Climate Change, Air Quality, Land and Soils, and Population and Human Health. The final impact of interactions for each environmental factor has been assigned accounting for the various embedded design features as well as mitigation measures proposed in this chapter and the accompanying NIS and CEMP reports.

### 5.10.1 Population and Human Health

The open space, including Lough Atalia Walk incorporated into the design of Proposed Development will provide outside areas for residents/members of the public, including play and amenity areas. Interaction with population and human health involves the provision of lighting to provide a safe outdoor realm for the people which, without mitigation, could impact on nocturnal species, particularly on bats, otter, and seal which may be present in the wider area. Mitigation measures proposed and outlined in further detail in Section 5.6 below, include restricted lighting in the core and buffer zones that overlook Galway Bay, as appropriate, and a lighting design minimising impact on bats and other nocturnal animals, ensuring suitable commuting and foraging habitat is maintained throughout.

With the implementation of the outlined mitigation measures, the interaction between population/human health and biodiversity will be *long-term, not significant and neutral. These effects are deemed non-significant within the context of the EIA Directive.*

### 5.10.2 Land and Soils

The Proposed Development will involve the excavation and removal of approximately 11,594m³ of soil and subsoil including made ground as part of remedial excavations at the site during the construction phase which will then be removed offsite for disposal to a licensed facility. This will result in a permanent but non-significant impact on land and soil, in line with local zoning objectives. Works will also generate dust and potentially impact on the air quality in the locality. However, the generation of dust will be temporary and is restricted to the

construction phase of the Proposed Development. As such, it is not anticipated to have the ability to cause a significant impact on biodiversity.

The excavation of Made Ground impacted with anthropogenic contamination (i.e., hydrocarbons and metals) and permanent removal offsite is a design requirement of the Proposed Development, which will improve the quality of the shallow soils beneath the site. There is a potential risk to construction workers from shallow soil impacted by contamination which is considered low to medium and will be mitigated through best practice measures outlined in the Construction Environmental Management Plan (CEMP). No significant adverse effects are anticipated under the EIA Directive. Waste materials will be managed by authorised contractors and sent to licensed facilities.

The impact of the interactions between land and soils (Chapter 6) and biodiversity (this chapter) are considered to be temporary, imperceptible, and neutral. These effects are deemed non-significant within the context of the EIA Directive.

### 5.10.3 Hydrology

Water is the primary environmental medium through which the Proposed Development may interact with biodiversity. Potential effects on the hydrological and hydrogeological environment are assessed in Chapter 7 – Hydrology of this EIAR, as well as in the accompanying AA Screening Report and Natura Impact Statement (DNV, 2025a; 2025b). These assessments ensure that both the quality (e.g. pollution, sedimentation) and quantity (e.g. surface water runoff) of water are maintained to appropriate standards throughout the lifecycle of the Proposed Development.

Hydrology and biodiversity are closely linked, particularly where ecological receptors, such as sensitive habitats or species, are dependent on water quality and flow regimes. For example, an accidental pollution event during the construction or operational phases could adversely affect nearby aquatic or intertidal habitats, especially those hydrologically connected to the Site, such as Galway Bay and Lough Atalia.

To address these risks, a suite of mitigation measures is proposed within the NIS and this biodiversity chapter, designed to prevent any significant deterioration in water quality. These include surface water management controls, pollution prevention protocols, and construction-phase safeguards, ensuring that biodiversity is protected from hydrological impacts.

In addition, Chapter 5 – Biodiversity of this EIAR provides a detailed assessment of the potential impacts of the Proposed Development on habitats, flora, and fauna. Particular emphasis is placed on species and habitats that may be affected by excavation, material importation, and other site activities. The chapter also evaluates impacts on species protected under national and international legislation, or considered of conservation importance, and outlines appropriate mitigation measures to avoid or reduce these impacts.

The impact of the interactions between hydrology and biodiversity (this chapter) are considered to be temporary, imperceptible, and neutral. These effects are deemed non-significant within the context of the EIA Directive.

### 5.10.4 Air Quality

Interactions between air quality and biodiversity have been considered in conjunction with Chapter 5 (Biodiversity). During the demolition and construction phase, dust emissions could

potentially affect nearby habitats and species. However, the mitigation measures outlined in the chapter will minimise dust deposition and no significant impacts on designated sites or sensitive ecological receptors are anticipated. No significant interactions are expected during the operational phase.

The impact of the interactions between air quality (Chapter 8) and biodiversity (this chapter) are considered to be *short-term, imperceptible, and neutral*. These effects are deemed non-significant within the context of the EIA Directive.

### 5.10.5 Climate Change

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:

- Planting of native tree and hedgerow species selected for their adaptability to changing climatic conditions;
- Integration of green infrastructure such as permeable paving, green walls, and pollinator-friendly planting to support ecosystem services;
- 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, urban cooling, and ecological connectivity, enhancing the site's resilience to climate change and supporting long-term

biodiversity conservation. The impact of the interactions between climate change and biodiversity (this chapter) are considered to be *long-term, imperceptible, and neutral*. These effects are deemed non-significant within the context of the EIA Directive.

### 5.10.6 Noise

This chapter has also been developed in close liaison with the author of the Noise chapter to evaluate the potential effects of noise and vibration on sensitive ecological receptors. Particular attention was given to the potential for disturbance at nearby designated sites, including the Inner Galway Bay Special Protection Area (SPA), Galway Bay Complex Special Area of Conservation (SAC), and Lough Corrib SAC. Biodiversity assessment data informed the assessment of potential impacts on protected species and habitats, particularly in relation to noise-sensitive periods such as breeding or foraging. This collaborative approach ensures that any required mitigation measures are appropriately aligned to safeguard both ecological and human receptors from adverse noise and vibration effects. The impact of the interactions between noise and biodiversity (this chapter) are considered to be *temporary, negative, and slight*. These effects are deemed non-significant within the context of the EIA Directive.

### 5.10.7 Landscape

As the habitats present on Site are largely man-made, and heavily modified/urbanised, significant impacts on flora and fauna arising from the Proposed Development within the footprint of the Site are not envisaged. However, the landscape masterplan (Figure 5-12 Proposed Landscape Masterplan (Stephen Diamond Associates, July 2025)) introduces a comprehensive suite of green infrastructure and ecological planting measures designed to significantly enhance biodiversity, improve habitat connectivity, and support native flora and fauna. These include:

- Grass lawns
- Nature-based play areas
- Native hedgerow and tree planting
- Ornamental perennials and grasses
- Green walls & raised planting beds
- Communal areas

Open spaces are therefore being incorporated into the Site to provide amenity areas for residents and visitors, which will include play areas, grass lawns, and communal areas to include the plaza and the Lough Atalia Walk.

Overall, the landscape plan for the Proposed Development clearly reflects a strong emphasis on ecological enhancement and sustainable urban design. Through the incorporation of native plant species, habitat features, and biodiversity-friendly infrastructure across the Site, the Proposed Development will revitalise a previously low ecological value urban area into a meaningful local ecological asset. The proposed planting will establish ecological corridors that support movement and foraging, offer potential nesting sites, and enhance food availability for small mammals, birds, and bat species that may inhabit the site and surrounding landscape.

These measures align with national biodiversity strategies and contribute to the overall environmental resilience of the Galway Bay coastal zone. Therefore, the interactions between

biodiversity and landscape are considered to be *long-term, moderate, positive* impact. These effects are deemed non-significant within the context of the EIA Directive.

### 5.10.8 Material Assets: Waste and Utilities

In accordance with the requirements of the Habitats Directive and the concerns raised in the LRD Opinion, the potential for contaminated land to impact nearby European sites has been carefully considered. A comprehensive Appropriate Assessment (AA) Screening and NIS have been undertaken, concluding that, with the implementation of proposed mitigation measures, the Development will not result in deterioration or disturbance of natural habitats or species. These findings are supported by this Biodiversity Chapter, which includes baseline ecological surveys, identification of sensitive receptors, and detailed mitigation measures. These include surface water protection measures, dust and noise control, lighting restrictions, and timing of works, all of which are designed to prevent adverse effects on designated sites. The management of any contaminated material encountered during construction will be carried out in accordance with these measures, ensuring that ecological receptors are protected throughout the project lifecycle. Potential effects on biodiversity are addressed in Section 5.5. The impact of the interactions between material assets and biodiversity (this chapter) are considered to be *short-term, imperceptible, and neutral*. These effects are deemed non-significant within the context of the EIA Directive.

## 5.11 Residual Effects

Residual effects are effects that remain once mitigation has been implemented or effects that cannot be mitigated. Table 5-20 below provides a summary of the effect assessment for the identified KERs and details the nature of the effects identified, the mitigation measures proposed, and the classification of any residual effects.

Both standard construction phase control measures, and specific mitigation measures, have been outlined to ensure that the Proposed Development does not have an effect 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.

Provided all recommended measures are implemented in full and remain effective throughout the lifetime of the Proposed Development, no significant negative residual effects on the local ecology, or on any designated nature conservation sites, will occur as a result of the Proposed Development.

*Table 5-20 Summary of Potential Effects on KER(s), Mitigation Proposed and Residual Effects.*

| Key Ecological Resource | Evaluation | Potential Effect | Effect Without Mitigation | | | | Proposed Mitigation / Mitigating Factors | Proposed Enhancements | Residual Impact |
|---|---|---|---|---|---|---|---|---|---|
| | | | Quality | Magnitude / Extent | Duration | Significance | | | |
| **DESIGNATED SITES** | | | | | | | | | |
| No effects to any nationally designated sites will occur as a result of the Proposed Development and therefore no mitigation measures are recommended. Mitigation measures for the protection of European sites are included within the Natura Impact Statement accompanying this submission under a separate cover. | | | | | | | | | |
| **FAUNA** | | | | | | | | | |
| **Bat Assemblage** | Local Importance (Higher Value) | **Construction phase:** Light-related disturbance<br>**Operational phase:** Light-related disturbance<br>Planting schedule per landscape plan | *Negative*<br>*Negative*<br>*Positive* | *Local*<br>*Local*<br>*Local* | *Short-term*<br>*Permanent*<br>*Permanent* | *Moderate*<br>*Moderate*<br>*Slight* | **Mitigation 5:** Construction phase Lighting<br>**Mitigation 7:** Operational phase Lighting | **Landscape Plan –** creation of ecological corridors and food sources for bat species that may be present in the area<br>**Enhancement 6:** Bat Boxes | **Long term, positive impact.** |
| **Wintering Bird Assemblage** | Local Importance (Higher Value) | **Construction phase:** Water Quality impacts from construction activity<br>Disturbance from Construction activity | *Negative*<br>*Negative* | *Local*<br>*Local* | *Short-term*<br>*Short-term* | *Moderate*<br>*Moderate* | **Mitigation 1:** Water Quality Protection Measures<br>**Mitigation 2:** Air Quality Control | **Landscape Plan** (Supplementary planting to provide screening) | **Negative, Local, Short-term, Slight.**<br>*(Imperceptible long-term)* |

| Key Ecological Resource | Evaluation | Potential Effect | Effect Without Mitigation | | | | Proposed Mitigation / Mitigating Factors | Proposed Enhancements | Residual Impact |
|---|---|---|---|---|---|---|---|---|---|
| | | | Quality | Magnitude / Extent | Duration | Significance | | | |
| | | **<u>Operational phase:</u>**<br>Human disturbance<br><br>Light disturbance<br><br>Collision Risk<br><br>Planting schedule per landscape plan | *Negative*<br><br>*Negative*<br><br>*Neutral*<br><br>*Positive* | *Local*<br><br>*Local*<br><br>*Local*<br><br>*Local* | *Permanent*<br><br>*Permanent*<br><br>*Permanent*<br><br>*Permanent* | *Not Significant*<br><br>*Moderate*<br><br>*Not Significant*<br><br>*Slight* | **Mitigation 3**: Noise & Visual Stimuli Screening<br><br>**Mitigation 5:** Construction phase Lighting<br><br>**Mitigation 7:** Operational phase Lighting<br><br>Avoidance of direct pathways from the Site to the bay/shoreline.<br><br>Design-stage embedded mitigation to avoid collision risk. | **Enhancement 1-5:** will all make the site more appealing for birds in general, provide screening, and foraging resources. | |
| **Breeding Bird Assemblage** | Local Importance<br><br>(Higher Value) | **<u>Construction phase:</u>**<br>Water Quality impacts from construction activity<br><br>Disturbance from Construction activity<br><br>**<u>Operational phase:</u>** | *Negative*<br><br>*Negative* | *Local*<br><br>*Local* | *Permanent*<br><br>*Short-term* | *Moderate*<br><br>*Moderate* | **Mitigation 1:** Water Quality Protection Measures<br><br>**Mitigation 2:** Air Quality Control | **Landscape Plan** (Supplementary planting to provide screening)<br><br>**Enhancement 1-6:** will all | **Short-term, imperceptible.**<br><br>*(long-term, sight)* |

| Key Ecological Resource | Evaluation | Potential Effect | Effect Without Mitigation | | | | Proposed Mitigation / Mitigating Factors | Proposed Enhancements | Residual Impact |
|---|---|---|---|---|---|---|---|---|---|
| | | | Quality | Magnitude / Extent | Duration | Significance | | | |
| | | Human disturbance<br><br>Light disturbance<br><br>Collision Risk<br><br>Planting schedule per landscape plan | *Negative*<br><br>*Negative*<br><br>*Neutral*<br><br>*Positive* | *Local*<br><br>*Local*<br><br>*Local*<br><br>*Local* | *Permanent*<br><br>*Permanent*<br><br>*Permanent*<br><br>*Permanent* | *Not Significant*<br><br>*Moderate*<br><br>*Not Significant*<br><br>*Slight* | **Mitigation 3**: Noise & Visual Stimuli Screening<br><br>**Mitigation 5:** Construction phase Lighting<br><br>**Mitigation 7:** Operational phase Lighting<br><br>Avoidance of direct pathways from the Site to the bay/shoreline.<br><br>Design-stage embedded mitigation to avoid collision risk. | make the site more appealing for birds in general, provide screening, foraging, and nesting resources. | |
| **Large Terrestrial Mammals** | Local Importance (Higher value) | **<u>Construction phase:</u>**<br>Risk of injury or death during vegetation clearance and / or entrapment in construction-related rubbish.<br><br>Disturbance from noise, dust and/or lighting. | *Negative*<br><br>*Negative* | *Local*<br><br>*Local* | *Short-term*<br><br>*Short-term* | *Significant*<br><br>*Moderate* | **Mitigation 1:** Water Quality Protection Measures<br><br>**Mitigation 2:** Air Quality Control | Landscape Plan<br><br>**Enhancement 1-5:** habitat creation and management in a wildlife friendly manner | **Imperceptible** |

| Key Ecological Resource | Evaluation | Potential Effect | Effect Without Mitigation | | | | Proposed Mitigation / Mitigating Factors | Proposed Enhancements | Residual Impact |
|---|---|---|---|---|---|---|---|---|---|
| | | | Quality | Magnitude / Extent | Duration | Significance | | | |
| | | **<u>Operational phase:</u>**<br>Planting schedule per landscape plan<br><br>Increased human presence leading to increased disturbance. | *Positive*<br><br>*Negative* | *Local*<br><br>*Local* | *Permanent*<br><br>*Permanent* | *Slight*<br><br>*Moderate* | **Mitigation 3**: Noise & Visual Stimuli Screening<br><br>**Mitigation 5:** Construction phase Lighting<br><br>**Mitigation 7:** Operational phase Lighting<br><br>Avoidance of direct pathways from the Site to the bay/shoreline.<br><br>Best practice guidance as per **CEMP** | | |

## 5.12 Difficulties Encountered

There were no difficulties encountered in compiling the information for Chapter 5 Biodiversity.

## 5.13 Conclusion

This Biodiversity Chapter has been prepared based on detailed information provided by the applicant regarding the Proposed Development at a site located adjacent to Galway Bay, an ecologically sensitive and designated marine area. The Site itself is currently characterised by urban fabric, with limited existing biodiversity value due to its predominantly built-up nature and low levels of ecological connectivity. However, its proximity to Galway Bay and associated habitats necessitates a careful and considered approach to biodiversity protection and enhancement.

The assessment incorporates data from both desk-based studies and field surveys and considers all relevant aspects of the Proposed Development during both the Construction and operational phases. This includes the Site layout, drainage design, landscaping proposals, and lighting strategy, all of which have been evaluated in terms of their potential impact on local habitats and species.

Provided that the mitigation measures outlined in this report are implemented in full, including dust control, lighting management, noise reduction, and habitat protection, it is considered that the Proposed Development will not result in any significant negative impacts on valued habitats, designated sites, or individual or group species, including those associated with Galway Bay.

In addition to mitigation, a suite of biodiversity enhancement measures has been proposed in tandem with the landscape plan. These include:

- Extensive planting and sowing of native species, including trees, hedgerows, and wildflower meadows, to improve habitat diversity and ecological connectivity.
- Installation of wildlife-supporting features such as Swift bricks, bird boxes, bat boxes, and insect hotels, which will provide nesting and foraging opportunities for a range of urban-adapted and protected species.
- Integration of green infrastructure elements such as permeable surfaces, green walls, and pollinator-friendly planting to support ecosystem services.

These enhancements are designed not only to offset any residual impacts but to deliver a net gain in biodiversity across the site. The landscaping plan proposes a substantial increase in the coverage of trees, hedgerows, grassland, and wildflower meadows, transforming the Site from a predominantly hard-surfaced urban area into a more ecologically functional and visually appealing environment.

In conclusion, the Proposed Development is expected to result in an overall slight positive impact on biodiversity, contributing to the ecological resilience of the area and supporting the broader conservation objectives of Galway Bay and its surrounding habitats.

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# 6 LAND AND SOILS

## 6.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant 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 Proposed Development 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, 12 Material Assets: Traffic and Chapter 13 Material Assets: Waste and Utilities of the EIAR and other information provided by the Applicant and Design Team pertaining to the design proposals for the Proposed Development.

### 6.1.1 Quality Assurance and Competency of Experts

This chapter of the EIAR was prepared by Nuria Manzanas BSc, MSc, a Principal Consultant of DNV. Nuria is a Chartered Geologist (PGeo) with the Institute of Geologists of Ireland (IGI) with over 11 years’ experience in contaminated land and hydrogeological assessments.

This chapter of the EIAR was also prepared by Gareth Carroll BA BEng MIEnvSc CEnv, a Principal Consultant of DNV. Gareth is a Chartered Environmentalist (CEnv) with the Institute of Environmental Sciences (IES) with over 12 years’ experience of preparing environmental and hydrogeological assessments for a range of project types and geological and hydrogeological site settings.

This chapter of the EIAR was approved by Patrick Higgins BSc, MSc, MIEnvSc, CEnv, with over 20 years’ experience of preparing environmental and hydrogeological assessments for a range of project types and geological and hydrogeological site settings and who is Technical Director with DNV, 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 takes cognisance of relevant guidelines, in particular the following:

- Department of Housing, Local Government and Heritage, 2018. Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Effect Assessment
- S.I. No. 92 of 2011- European Parliament and of the Council on the assessment of the effects of certain public and private projects on the environment including amendments S.I. No. 52 of 2014.
- S.I. No. 98 of 2008 - European Parliament and of the Council on waste and repealing certain Directives.
- Environmental Protection Agency, May 2022. Guidelines on the information to be contained in Environmental Effect Assessment Reports (EPA, 2022).
- Institute of Sustainability and Environmental Professionals (ISEP) (formerly Institute of Environmental Management and Assessment (IMEA)), 2022. A New Perspective on Land and Soil in Environmental Effect Assessment.
- Institute of Geologists of Ireland Guidelines, 2002. Geology in Environmental Effect Statements, A Guide (IGI, 2002).
- Institute of Geologists of Ireland Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Effect 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).
- Galway City Development Plan 2023 – 2029 (GCC, 2023).

### 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 and Soils 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 2.0km 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 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 2.0 km from the site, as recommended by the 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 Proposed Development 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 site of the Proposed Development and surrounding area including published information and details pertaining to the Proposed Development provided by the applicant and design team.

Site walkover inspections and surveys were conducted by DNV on the 2nd of May 2024 and the 4th of June 2025. These inspections aimed to identify and assess the site condition, the site setting, and the receiving environment, including local geological features and potential receptors.

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 2025 (EPA, 2025).
- Geological Survey of Ireland (GSI) Datasets Public Viewer and Groundwater webmapping, 2025 (GSI, 2025).
- Google Earth Mapping and Imagery, 2025 (Google Earth, 2025).
- Ordnance Survey Ireland (OSI) webmapping, 2025 (OSI, 2025).
- National Parks and Wildlife Services (NPWS) webmapping, 2025 (NPWS, 2025).
- Teagasc webmapping, 2025 (Teagasc, 2025).
- Information provided by the Applicant pertaining to the design proposals for the Proposed Development.

The findings of previous site investigations undertaken at the site were also reviewed by DNV as part of the Element 1 stage of the assessment as summarised below. Copies of the relevant reports are presented in Volume 3: Appendix 6-1 of this EIAR.

Initial site investigations were carried out in 2009 by RSK Group Plc across a wider area encompassing the Proposed Development site. Subsequent investigations were undertaken between August and September 2019 by MKO (2019), who were commissioned by the Galway Harbour Company (GHC), covering an area of approximately 11 hectares (ha). This phase included the excavation of trial pits and window sampler boreholes, along with the collection and analysis of soil and groundwater samples, and gas monitoring at the investigation locations.

Following the findings and recommendations of the earlier investigations, a further site investigation was conducted between August and September 2022 by MKO (2022) on behalf of GHC, for due diligence purposes and to support future land use planning and design

processes, which focused on an area of approximately 1.6 ha corresponding to the actual footprint of the Proposed Development. This investigation involved the excavation of fifteen (15 No.) window sampler boreholes, followed by rotary core boreholes, and the collection of soil and groundwater samples.

The most recent site investigation was undertaken between July and September 2024 by Ground Investigations Ireland (GII) (2024) on the instructions of TOBIN Consulting Engineers (TOBIN), on behalf of the Land Development Agency (LDA). This phase comprised the excavation of fifteen (15 No.) trial pits and nine (9 No.) cable percussion boreholes, followed by rotary core drilling. Three (3 No.) of the rotary core boreholes were installed as groundwater monitoring wells. Soil samples were collected, and groundwater level monitoring was initiated at the relevant locations.

**Element 2:** Involves direct and indirect site investigation and studies 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 reviewed in Element 1, it was determined based on professional judgement, that in accordance with industry best practice guidance and standards there was adequate site-specific scientific data available for the assessment. The previous studies reviewed as part of Element 1 provided sufficient information including comprehensive site investigations and site-specific information on the geological conditions at the site to inform the effect assessment of the Proposed Development on the receiving land, soil and geology.

**Element 3:** Evaluation of mitigation measures, residual effects and final effect assessment was based on the outcome of the information gathered in Element 1 of the assessment. Mitigation measures to address all identified adverse effects that were identified in Element 1 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 chapter of this EIAR, 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 of the importance of geological features at the site, as documented in the National Roads Authority Guidelines (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.<br><br>Degree or extent of soil contamination is significant on a national or regional scale.<br><br>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).<br><br>Large existing quarry or pit.<br><br>Proven economically extractable mineral resource. |

| Importance | Criteria | Typical Example |
|---|---|---|
| **High** | Attribute has a high quality, significance, or value on a local scale.<br>Degree or extent of soil contamination is significant on a local scale.<br>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.<br>Large recent landfill site for mixed wastes.<br>Geological feature of high value on a local scale (County Geological Site).<br>Well drained and/or high fertility soils.<br>Moderately sized existing quarry or pit.<br>Marginally economic extractable mineral resource. |
| **Medium** | Attribute has a medium quality, significance, or value on a local scale.<br>Degree or extent of soil contamination is moderate on a local scale.<br>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.<br>Small recent landfill site for mixed wastes.<br>Moderately drained and/or moderate fertility soils.<br>Small existing quarry or pit.<br>Sub-economic extractable mineral resource. |
| **Low** | Attribute has a low quality, significance, or value on a local scale.<br>Degree or extent of soil contamination is minor on a local scale.<br>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.<br>Small historical and/or recent landfill site for construction and demolition wastes.<br>Poorly drained and/or low fertility soils.<br>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 is described in Table 6-2 in accordance with the EPA guidelines on the information to be contained in EIARs (EPA, 2022).

*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 weather 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.

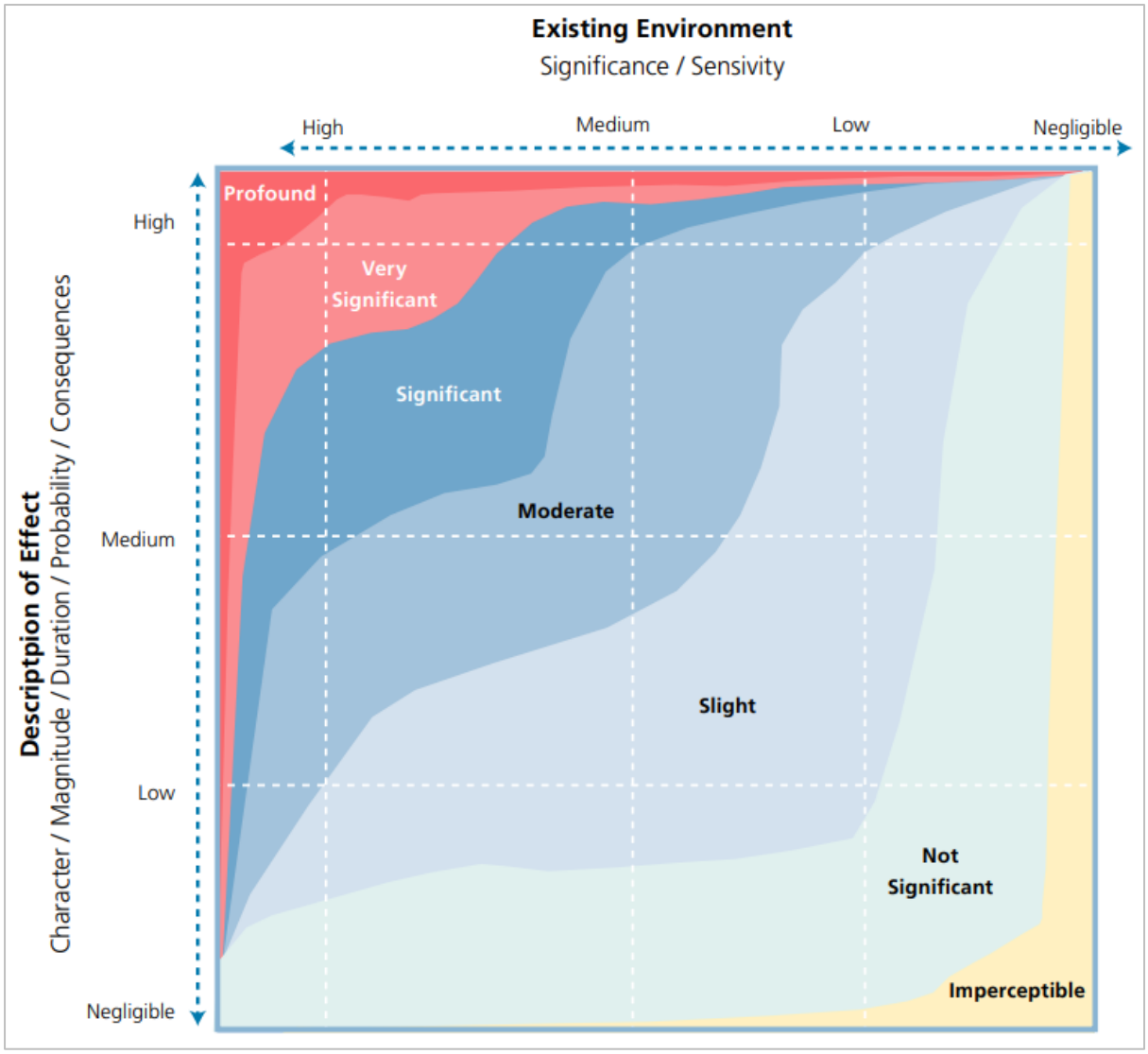



*Figure 6-1 Determining Significance*

## 6.3 The Existing and Receiving Environment (Baseline Situation)

### 6.3.1 Site Location and Description

The site location and a full description of the existing and historical land use at the site are provided in Chapter 2 (Description of the Proposed Development) of this EIAR.

The site location is presented in Figure 6-2, and the current site layout is presented in Figure 6-3.




*Figure 6-2 Site Location*




*Figure 6-3 Current Site Layout*

### 6.3.2 Topography

Due to the site primarily being composed of reclaimed land from Galway Bay the topography at the site is generally level and just about sea level. The site gently slopes from northwest to southeast.

The topography surrounding the Proposed Development site is generally sloping toward the southeast and east in the general direction of Lough Atalia.

### 6.3.3 Soils

The soils in the northwestern boundary of the site are classified as made ground (IFS Soil Code: Made), (Teagasc, 2025). The soils within the majority of the site are not mapped on the Teagasc mapping tool. However, previous site investigations have shown that there is a layer of Made Ground within and outside of the Proposed Development site boundary.

The soils beneath the site are presented in Figure 6-4.




*Figure 6-4 Teagasc Soils*

### 6.3.4 Quaternary Deposits

The subsoil or quaternary deposits beneath a small portion within the northwestern boundary of the site are mapped by the GSI as Urban (Urban) (GSI, 2025). The subsoils within the majority of the site are not mapped on the GSI mapping tool. However, previous site investigations have shown that there is a layer of Possible Estuarine Sediments (PED) within and outside the Proposed Development site boundary which generally comprises very soft to very stiff greyish brown slightly sandy gravelly clay, sandy organic clay or silty clay.

The quaternary sediments beneath the site are presented in Figure 6-5.




*Figure 6-5 Quaternary Soils*

### 6.3.5 Quaternary Geomorphology

A subglacial landform identified as a Drumlin is mapped by the GSI (GSI, 2025) approximately 0.08km northwest of the site, oriented in a northeast to southwest direction. Seven (7 No.) subglacial drumlins with the same orientation are also located within 2km of the site.

Nine (9 No.) subglacial landforms are located approximately 2.9km northeast of the site at their closest point and are described as “streamlined bedrock” (GSI, 2025).

### 6.3.6 Bedrock Geology

The bedrock beneath the majority of the site is not mapped by the GSI (GSI, 2025) as the area comprises reclaimed land from Lough Atalia. However, the site’s northwest boundary is mapped as part of the Metagabbro and Orthogenesis Suite (code: LTMGOG) which comprises Undifferentiated Quartz-Diorite Gneiss (Qd), Quartz Diorite Gneiss and Granitic Gneiss (Qg), and Metagabbro and Related Lithologies (Mg).

As discussed in Section 6.3.7, previous site investigations (MKO, 2022) have identified two (2 No.) distinct types of bedrock beneath the site:

- The Metagabbro and Orthogenesis Suite encountered at depths ranging between 6.7 meters below ground level (mbgl) and 9.45mbgl.
- The Orthogneiss Suite encountered at depths ranging between 7.1mbgl and 9.1mbgl.

The bedrock geology beneath the site and the surrounding area is presented in Figure 6-6.

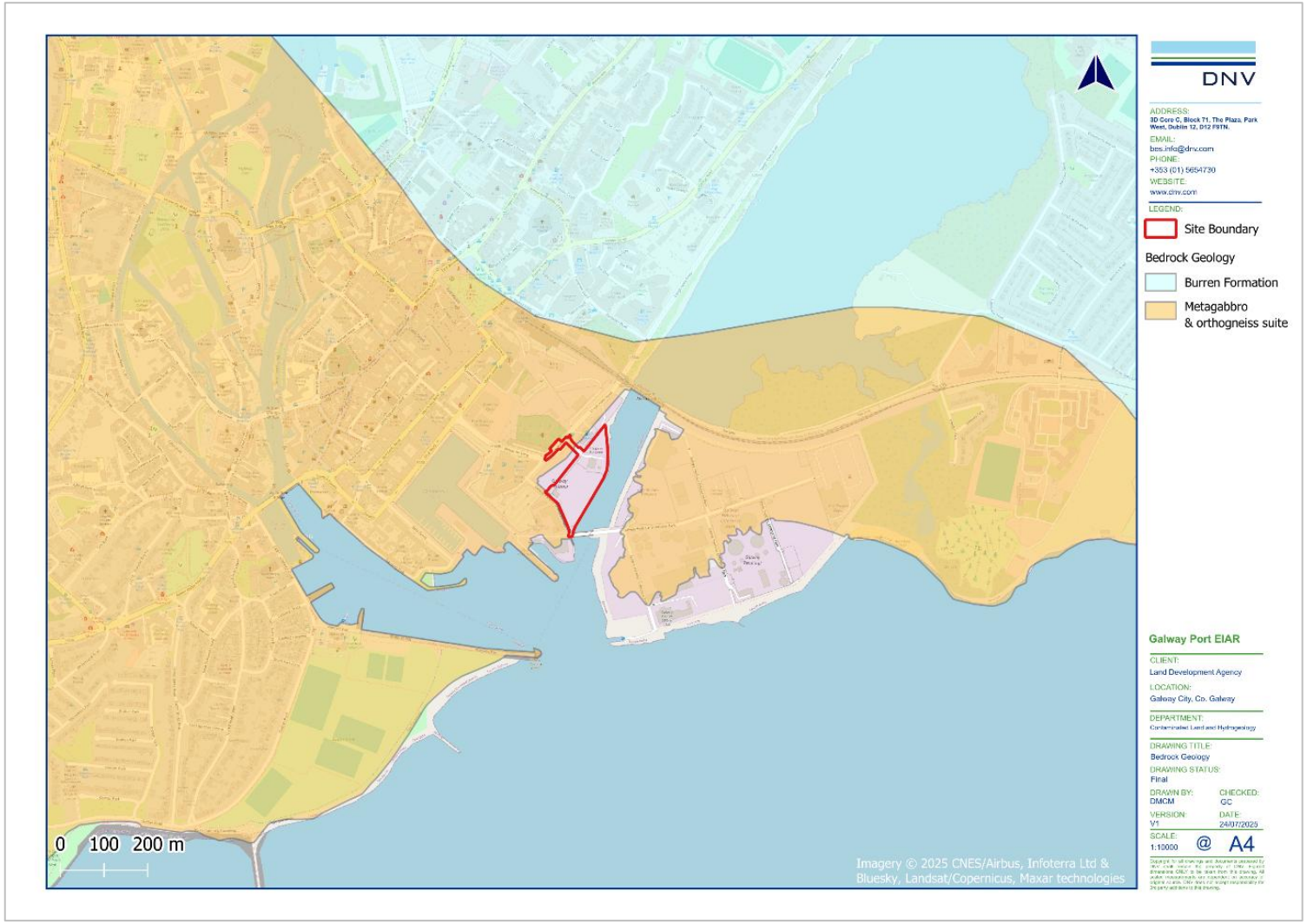



*Figure 6-6 Bedrock Geology*

### 6.3.7 Previous Site Investigations

The findings of previous site investigations undertaken at the site are summarised below. Copies of the relevant reports are presented in Volume 3: Appendix 6-1 of this EIAR.

#### *6.3.7.1 Site Investigations – 2009 (RSK)*

A Quantitative Risk Assessment (QRA) was undertaken by RSK Group Plc, based on information included in an Environmental Site Assessment (ESA) also produced by RSK in 2009. The ESA focused on a section of the Proposed Development site, specifically the former tank area where ground investigations had previously been conducted. This information was summarised as part of the MKO Planning and Environmental Consultants (MKO) report in 2019 (MKO, 2019). The findings of the assessment are summarised as follows:

- Human Health Generic Quantitative Risk Assessment (GQRA)
    - Soil: No concentrations of MTBE (methyl tert-butyl ether), BTEX (benzene, toluene, ethylbenzene and xylenes) or aliphatic / aromatic hydrocarbon fractions exceed the generic soil screening values for human health.
    - The report indicated that the potential risk to offsite workers from the soils was considered acceptable. Given the presence of less volatile Total Petroleum Hydrocarbons (TPH) fractions, the linkage to the nearest offsite residential receptors was considered to be incomplete.
    - Groundwater: No concentrations of MTBE, BTEX or aliphatic / aromatic hydrocarbon fractions exceed the generic groundwater screening values (GAC) for human health. Therefore, a potential exposure pathway to onsite workers, offsite workers and any offsite residents based on the CSM was considered incomplete, indicating that there is no viable linkage between the source and these receptors.
    .
- Risks to Utilities
    - The GAC for permeation of plastic pipes were exceeded in five of the soil samples tested from the top 1 metre.
    - The report concluded that a potential risk exists to the water supply, recommending further investigation to determine the level of risk.
- Summary of Pollutant Linkages
    - A potentially complete pollutant linkage was identified regarding the permeation of plastic services by hydrocarbons sorbed to shallow soil.
    - A potential risk was also noted to construction workers due to direct contact with hydrocarbon-affected soil.

#### *6.3.7.2 Site Investigations – 2019 (MKO)*

In 2019, the Galway Harbour Company (GHC) commissioned MKO to undertake a desk study and intrusive investigation at the Galway Inner Harbour site (Phase 1 – Galway Inner Harbour, Galway) for due diligence purposes and to support the planning and design processes (MKO, 2019).

At the time of the site walkovers (undertaken on the 14th and 21st August 2019) and associated site investigations, the former study site at the time of those investigations comprised various land uses. For ease of reference the former study site was divided into four areas (i.e., Areas

1 to 4) covering an area of approximately 11ha. The areas are presented in Figure 6-7 and summarised as follows:

- Area 1 - comprised the Galway Harbour Office and associated car parking.
- Area 2 - comprised the Contract Car Park, historically used to store iron ore from the Tynagh lead and zinc mine in East Galway (formerly the Tynagh Mines site).
- Area 3 – comprised the former coal yard and oil depot site. While no storage tanks were present during the walkover, remnants of bases, presumed to be former tank supports, were observed. A GHC representative confirmed that eleven oil storage tanks had been decommissioned and removed from the site in 2017.
- Area 4 - comprised the Texaco Petrol Station, shop and car wash, Mor Oil and City Direct Bus office and parking area located in the northern section of the former site.

Note that Area 1 and Area 2 are not part of the Proposed Development site boundary and did not form part of the site investigations undertaken during 2022 (MKO, 2022) and 2024 (GII, 2024). Site investigations in 2022 and 2024 were undertaken within Area 3 and Area 4 (which fall within the boundary of the site and Proposed Development).

Refer to Figure 6-7 for the separation of the four (4 No.) areas where 2019 site investigations were undertaken and the actual site boundary of the Proposed Development.

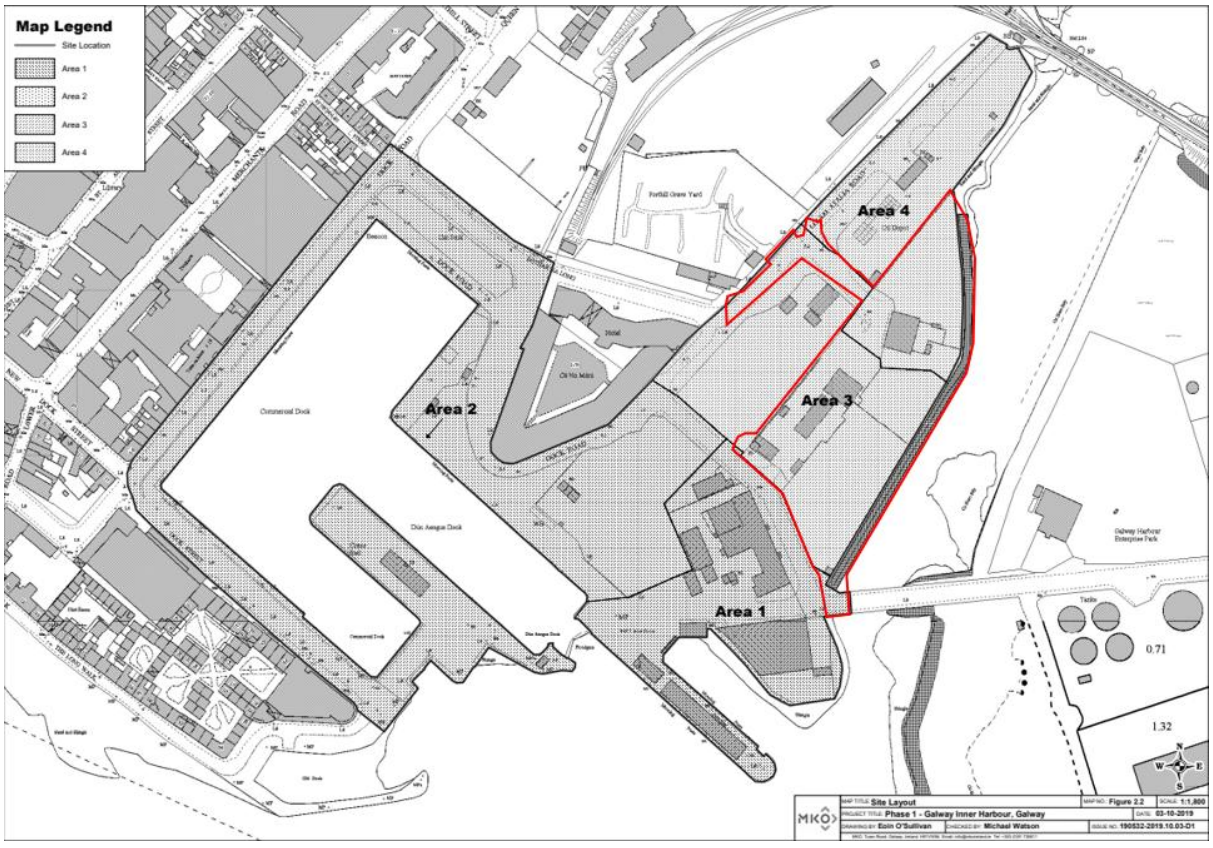



*Figure 6-7. Site Layout encompassing Areas 1 to 4 (MKO, 2019) and Proposed Development Site Boundary*

The scope of the investigations and the results are presented below.

Intrusive Site Investigations

A site investigation was undertaken from 28th August to 3rd September 2019 by Ground Investigations Ireland (GII) on behalf of MKO. The site investigation comprised the excavation of twenty-four (24 No.) window sampler boreholes (WS-01 to WS-24) to a maximum depth of 4.0mbgl within an extended site area of 11 ha comprising Areas 1 to 4. At the time of the site investigation, the area to the north of the site (Texaco petrol station and adjacent land) was inaccessible and, therefore, this section of the site was not investigated.

Gas and groundwater monitoring standpipes were installed at investigation locations WS-04, WS-09, WS-10, WS-12, WS-14, WS-16, WS-18 and WS-23. WS-16, WS-18 and WS-23 are located within the Proposed Development site boundary.

The site investigation locations are presented in Figure 6-8 which shows the investigations undertaken within Areas 1 to 4 and site investigations within the Proposed Development site.

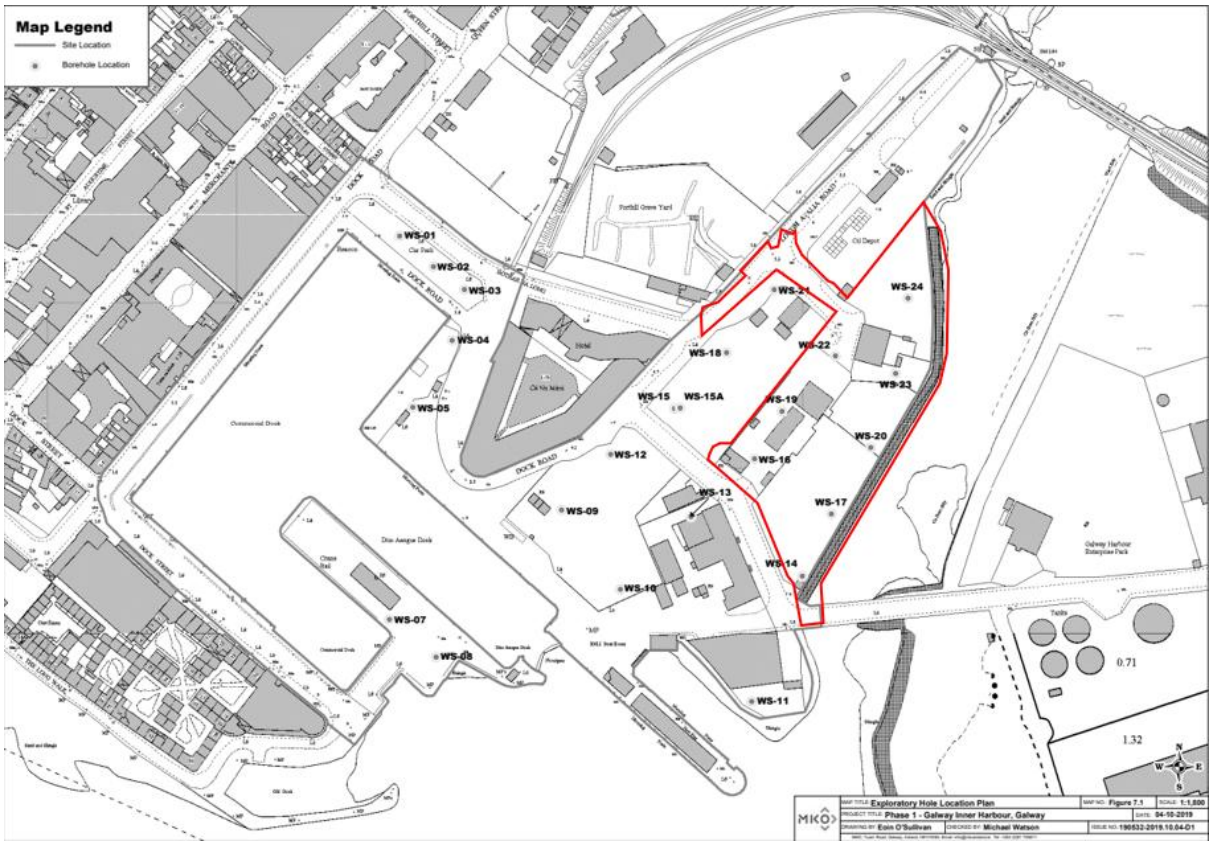



*Figure 6-8. Site Investigation Locations comprising an extended 11ha area (Areas 1 to 4) (MKO, 2019) and Proposed Development Site Boundary*

Ground Conditions

The ground conditions encountered at the former site boundary (Areas 1 to 4) during the site investigations are summarised as follows:

- Tarmac or reinforced concrete hardstanding: encountered to a maximum depth of 0.5mbglin all site investigation locations over the Made Ground.
- Made Ground: comprised grey, brown clayey gravel, sandy gravelly clay, sandy clayey gravel, silty sandy gravelly clay, gravelly clayey sand, gravelly clay or gravel. Gravel is fine to coarse subrounded to subangular with occasional cobbles of granite.

Occasional fragments of plastic, glass, red brick, clinker, slate, concrete, porcelain, and ash. This stratum ranged in thickness between 0.2 metres and 2.6 metres.

- Possible Made Ground: generally described as grey-brown sandy gravelly clay, clayey gravelly sand or sandy clayey gravel. This stratum ranged in thickness between 0.6 metres and 1.4 metres.
- Possible Estuarine Sediments: Grey, brown, soft to firm sandy gravelly silty CLAY, sandy gravelly silty CLAY or sandy gravelly CLAY with occasional subangular to subrounded cobbles of granite and occasional shell fragments. This stratum was only encountered at locations WS-04 and WS-21. This horizon ranged in thickness between 1.2 metres and 2.0 metres.

Laboratory Analytical Results

Thirty-one (31 No.) Made Ground samples and four (4 No.) soil samples were collected during the site investigations within the former site (Areas 1 to 4) and analysed in the laboratory for a range of parameters including heavy metals, TPH, BTEX and polycyclic aromatic hydrocarbons (PAHs). An asbestos screen was also carried out on the thirty-five (35 No.) soil samples.

The soil chemical results from the ground investigation were screened using Generic Assessment Criteria (GAC) derived by LQM/CIEH (Suitable 4 Use Levels) for a number of end use scenarios including 'Residential (without Private Gardens)' and 'Commercial' land use scenarios. The results are summarised as follows:

- Residential (without Private Gardens) Land Use Scenario:
    - Elevated concentrations of lead, benzo(a)pyrene, benzo(b)fluoranthene and dibenzo(a,h)anthracene were identified within the Made Ground across the former site (Areas 1 to 4), posing a risk to human health.
    - Asbestos containing material (ACM) (amosite and chrysotile fibre bundles): ACM were identified in the Made Ground samples at WS-10 between 1mbgl and 2mbgl and at WS-18 between ground level and 2mbgl outside of the Proposed Development site boundary.
    - Samples analysed in the possible estuarine sediments (PED) (i.e., natural ground) were below the assessment criteria and therefore were not considered to present an unacceptable risk to human health.
    - The risk to future site users from contaminants in the soil was assessed to be low to medium due to the elevated concentrations of lead and PAHs encountered in the Made Ground.
    - The risk to construction workers from contaminants in the soil was also assessed to be low to medium.
    - It is noted that a potential medium risk was identified given the ACMs identified in the Made Ground and the potential for ACMs to be present within the fabric of the existing buildings.
- Commercial Land Use Scenario:
    - The concentrations of the parameters analysed in Made Ground were below the assessment criteria and therefore were not considered to present an unacceptable risk to human health.

  - Samples analysed in the PED (i.e., natural ground) were also below the assessment criteria and therefore were not considered to present an unacceptable risk to human health.
  - As mentioned above, a potential medium risk was identified given the ACMs identified in the Made Ground and the potential for ACMs to be present within the fabric of the existing buildings.
- Risk to Vegetation and Plant Growth:
  - The concentrations of copper and zinc in the samples collected from the Made Ground were above those prescribed by BS3882:2015 and therefore pose a risk to vegetation and plant growth. The risk to vegetation and plants is considered to be medium based on the concentrations of phytotoxic contaminants present at the site.
  - It was concluded that the risk to vegetation and plants can be mitigated by the use of capping layers in communal landscaping and importation of clean topsoil and growth medium.
- Waste Classification:
  - The soil results were also assessed to determine whether the materials should be classified as ‘hazardous’ or ‘non-hazardous’ in accordance with the EPA guidance document Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-hazardous (2015), and the UK Environment Agency’s Technical Guidance WM3.
  - As mentioned above, ACMs, were identified in several soil samples collected from the underlying Made Ground. However, asbestos quantification indicated that the concentrations were below the hazardous threshold of >0.1% asbestos by weight.
  - Based on the results, seven (7 No.) samples (WS-10 (0.0-1.0mbgl and 1.0-2.0mbgl – outside the Proposed Development site boundary), WS-11 (0.0-0.70mbgl - outside the Proposed Development site boundary), WS-16 (0.0-1.0mbgl – within the Proposed Development site boundary), WS-18 (0.0-1.0mbgl, 1.0-2.0mbgl and 2.0-2.8mbgl - outside the Proposed Development site boundary)) were classified as hazardous, while twenty-eight (28 No.) were deemed non-hazardous (i.e. inert or non-hazardous) for waste recovery or disposal purposes. The results of the waste classification assessment are presented in Figure 6-9.

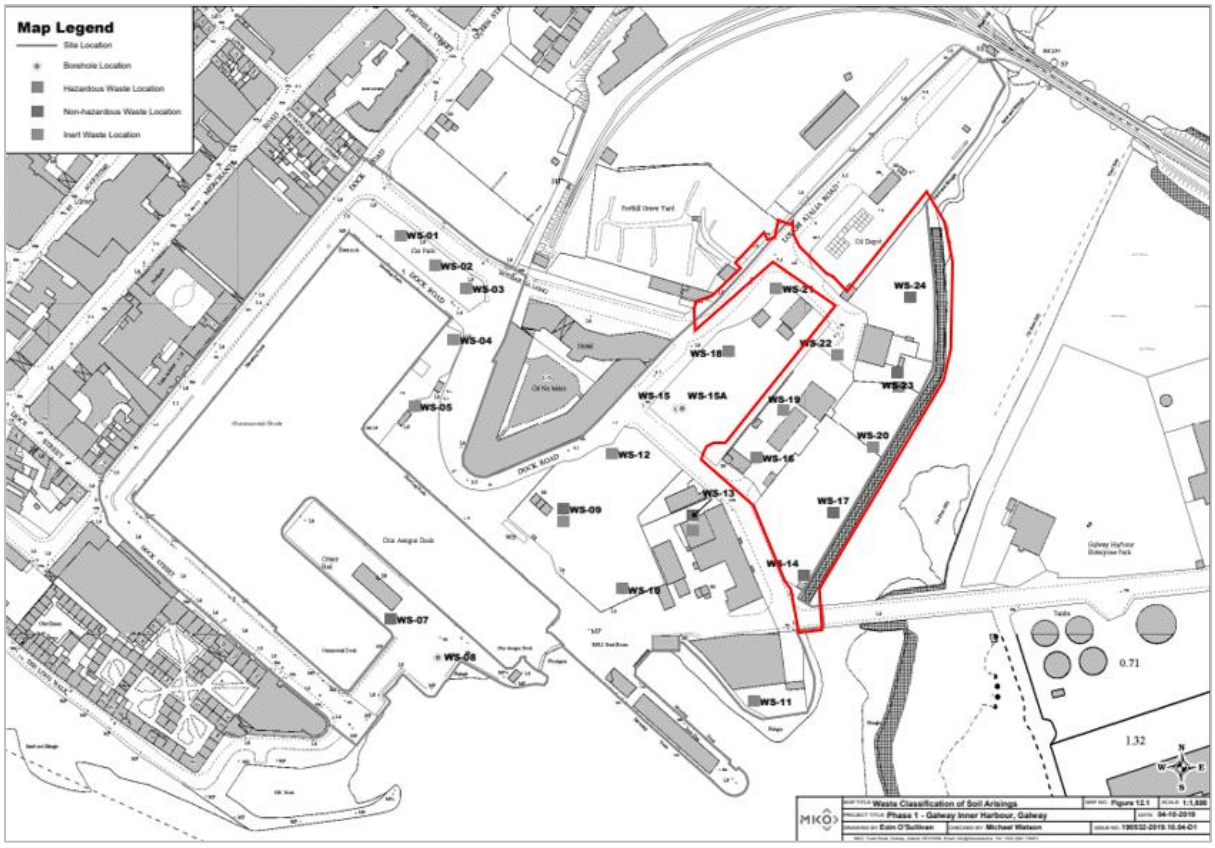



*Figure 6-9 Waste Classification Results (MKO, 2019)*

Ground Gas Assessment

Ground gas measurements were undertaken at the site on two (2 No.) occasions between the 19th of September 2019 and the 4th of October 2019 at monitoring well locations WS-04, WS-09, WS-10, WS-12. WS-14, WS-16, WS18 and WS-23.

The maximum recorded gas concentrations (by volume) across the site were 0.3% for methane and 2.0% for carbon dioxide. The highest flow rate recorded in the monitoring wells was less than 0.1 litres per hour (l/hr). Based on these results, gas screening values (GSVs) were calculated as 0.0003 l/hr for methane and 0.002 l/hr for carbon dioxide.

In accordance with the methodology outlined in CIRIA C665, the results indicated that the site falls within Characteristic Situation 1, which corresponds to a very low risk classification. Consequently, the risk to future users of the site associated with the recorded concentrations of methane and carbon dioxide was considered to be very low, and no gas protection measures were deemed necessary.

**Further Site Investigation**

The MKO Phase 1 Report (MKO, 2019) concluded that due to the uncertainties associated with the results obtained from the RSK-installed groundwater wells (WS-28 and WS-29 – no logs were available for those wells and location unknown), for which no borehole logs were available, and the inaccessibility of the northern portion of the site (including the Texaco petrol station and adjacent land), as well as refusal of several window sampler boreholes at shallow depths within the Made Ground, further site investigations were proposed.

#### *6.3.7.3 Site Investigations – 2022 (MKO)*

Based on the findings and conclusions of the initial MKO Phase 1 Report (MKO, 2019), additional site investigations were undertaken within an approximate area of 1.6ha in Area 3 and Area 4 (which fall within the boundary of the site and Proposed Development), as documented in the MKO Phase 2 Report (MKO, 2022).

The scope of the investigations and the results are summarised below.

Intrusive Site Investigations

Additional site investigations were undertaken between the 28th of August 2022 and the 30th of September 2022 by GII (Ground Investigations Ireland) on behalf of MKO. The site investigation comprised the excavation of fifteen (15 No.) window sampler boreholes (WS201 to WS215) to a maximum depth of 0.9mbgl and fifteen (15 No.) rotary core boreholes (BH01 to BH15) to a maximum depth of 12.30mbgl.

The site investigation locations are presented in Figure 6-10.




*Figure 6-10 Site Investigation Locations (MKO, 2022) (Proposed Development Site outlined in red)*

Ground Conditions

The ground conditions encountered during the additional site investigations (MKO, 2022) broadly corresponded to the findings of the previous investigations conducted in 2019 (MKO, 2019) and are summarised as follows:

- Made Ground: Encountered in all exploratory borehole locations beneath a surface layer of concrete or tarmac hardstanding (ranging from 0.04 m to 0.7 m thick), the Made Ground ranged in thickness from 2.65 m to 8.1 m. It generally comprised clayey gravel, sandy gravelly clay, sandy clayey gravel, silty sandy gravelly clay, gravelly clayey sand, gravelly clay, or gravel. A topsoil layer was also encountered at site investigation locations WS211 and WS212 within the Proposed Development site boundary.
- Possible Made Ground: Encountered in boreholes BH02, BH03, BH04, BH05, BH08, BH11 and BH12 (outside of the Proposed Development site boundary) and comprised grey, pink, and green gravel, cobbles and boulders.
- Possible Estuarine Sediments (PED): Typically encountered at depths between 1.0mbgl and 5.4mbgl below ground level, with thicknesses ranging from 1.2m to 3.1m. These sediments were observed a boreholes BH07, BH08, BH10 (within the Proposed Development site boundary) and BH14 and generally comprised very soft to very stiff greyish brown slightly sandy gravelly clay, sandy organic clay or silty clay.
- Bedrock:
    - The Metagabbro and Orthogenesis Suite was encountered beneath the Made Ground and PED in boreholes BH01, BH02, BH04 to BH10, BH13 and BH15 at depths ranging between 6.7mbgl and 9.45mbgl and was proven to a depth of 12.3mbgl. It comprised un-weathered to partially weathered very strong massive pink and/or green, grey coarse grained porphyritic metagabbro, very strong foliated dark greenish grey coarse grained phaneritic metagabbro or very strong massive green coarse grained phaneritic metagabbro.
    - The Orthogneiss Suite was encountered beneath the Made Ground and PED in boreholes BH03, BH11, BH12 and BH14 at depths ranging between 7.1mbgl and 9.1mbgl and was also proven to a depth of 12.3mbgl. It comprised of un-weathered very strong foliated dark greenish grey coarse grained phaneritic gneiss.

No visual or olfactory evidence of contamination was reported on the borehole logs. However, hydrocarbon odours were observed at groundwater monitoring wells BH07 and BH13 during the subsequent groundwater monitoring events. Organic odours were also observed at groundwater monitoring wells BH02 and BH10 during monitoring events.

Laboratory Analytical Results

Representative samples from the borehole arisings were collected for laboratory chemical and geotechnical testing and to further characterise the ground conditions across the site.

The soil analysis included the following parameters: heavy metals (antimony, arsenic, barium, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium and zinc), BTEX, TPH, PAHs, Polychlorinated biphenyl (PCBs); total monohydric phenols; Total Organic Carbon (TOC); Natural Moisture Content; and pH. In addition, the eleven (11 No.) soil samples collected from the Made Ground (WS203 and WS206 to WS215) were also screened for asbestos.

The soil chemical results from the ground investigation were screened using the same criteria applied in the Phase 1 Report (MKO, 2019). Specifically, the results were assessed against Generic Assessment Criteria (GAC) derived by LQM/CIEH (Suitable 4 Use Levels) for a range of end-use scenarios, including ‘Residential (without Private Gardens)’ and ‘Commercial’ land

use. It is noted that the Soil Guideline Value (SGV) for lead was withdrawn in the intervening period between the two site investigations and, therefore, the Category 4 Screening Level (C4SL) for lead was used in its place. The results are summarised as follows:

- Residential (without Private Gardens) Land Use:
    - Elevated concentrations of lead and benzo(a)pyrene were identified within the Made Ground across the site, posing a potential risk to human health. The concentrations of the remaining contaminants analysed were below the relevant GACs.
    - Samples analysed in the PEDs (i.e., natural ground) were below the relevant GACs and therefore were not considered to present an unacceptable risk to human health.
    - The risk to future site users from contaminants in the soil was assessed to be low to medium primarily due to the elevated concentrations of lead and PAHs encountered in the underlying Made Ground.
    - The risk to construction workers from contaminants in the soil was also assessed to be low to medium.
    - ACMs were not identified in the eleven (11 No.) samples collected from the Made Ground. However, given the presence of ACMs identified in the Made Ground during the 2019 investigation (MKO, 2019) and the potential for ACMs to be present within the fabric of the existing buildings a potential medium risk was identified.
- Commercial:
    - The concentrations of the parameters analysed were below the relevant GACs and therefore were not considered to present an unacceptable risk to human health based on a commercial land use scenario.
    - Samples analysed in the possible estuarine sediments (PED) (i.e. natural ground) were also below the relevant GACs. Therefore, they are not considered to present an unacceptable risk to human health based on a commercial land use scenario.
    - As mentioned above, a potential medium risk was identified given the ACMs previously identified in the Made Ground and the potential for ACMs to be present within the fabric of the existing buildings.
- Risk to Vegetation and Plant Growth:
    - The concentrations of copper and zinc in the samples collected from the Made Ground were above those prescribed by BS3882:2015 and therefore pose a risk to vegetation and plant growth. The risk to vegetation and plants is considered to be medium based on the concentrations of phytotoxic contaminants present at the site.
    - It was concluded that the risk to vegetation and plants can be mitigated by the use of capping layers in communal landscaping and the importation of clean topsoil and growth medium
- Risks to Utilities
    - As documented in the Phase 2 Report (MKO, 2022), the specific contaminants encountered at the site may potentially pose a risk to underground services, particularly water supply pipes.
    - It was concluded that this risk can be mitigated through the use of appropriate pipework material (MKO, 2022).

- Waste Classification
    - Based on the results, one (1 No.) sample was classified as hazardous, while the remaining ten (10 No.) samples were classified as non-hazardous (i.e. inert or non-hazardous) for waste recovery or disposal purposes.

A graphical representation of the conceptual site model is presented in Figure 6-11.

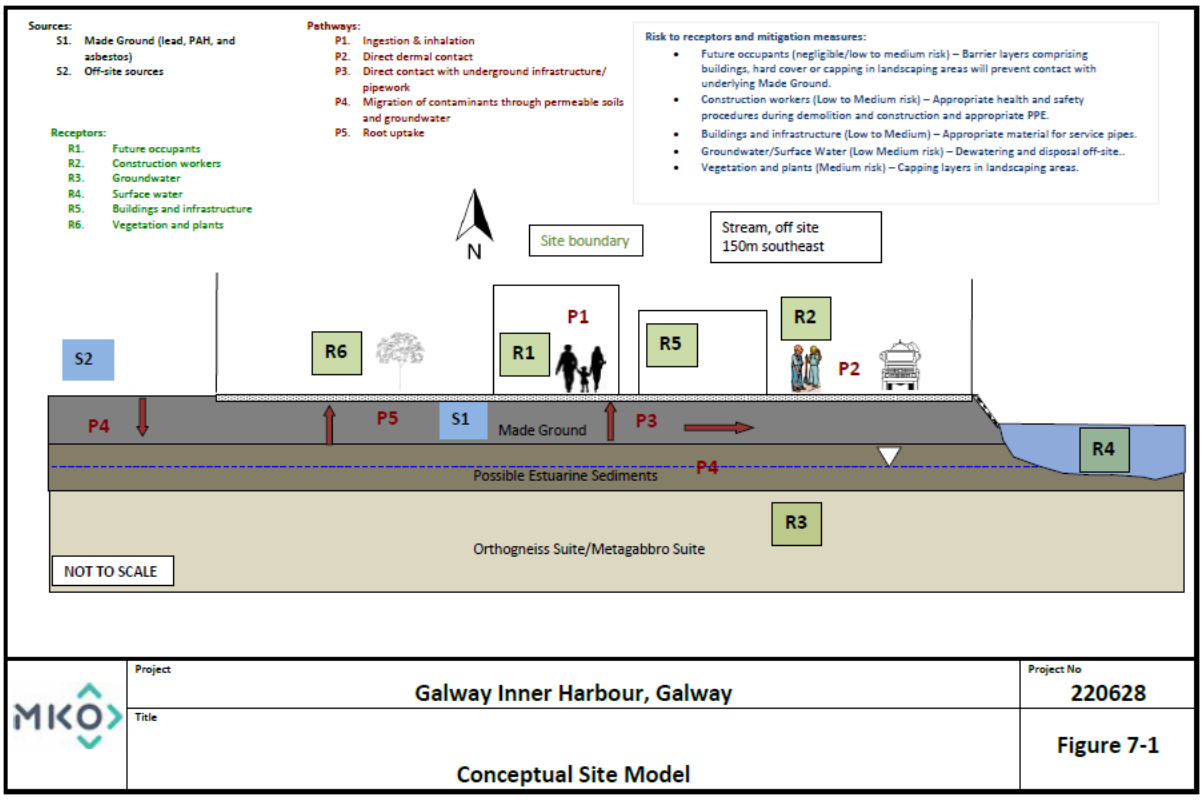



*Figure 6-11 Conceptual Site Model (MKO, 2022)*

Ground Gas Assessment

Ground gas measurements were undertaken at the site on two (2 No.) occasions between the 10th and 11th of November 2022 at monitoring well locations WS04, WS09, WS10, WS12, WS14, WS16, WS18 and WS23.

The maximum recorded gas concentrations (by volume) across the site were 0.3 v/v% for methane and 2.0 v/v% for carbon dioxide. The maximum flow rate recorded in the monitoring wells was recorded as 0.2 l/hr. Based on these results, GSVs were calculated as 0.0006l/h for methane and 0.004l/h for carbon dioxide.

In accordance with the methodology outlined in CIRIA C665, the results indicated that the site falls within Characteristic Situation 1, which corresponds to a very low risk classification. This corresponds with the findings of the 2019 site investigation (MKO, 2019). Consequently, the risk to future users of the site associated with the recorded concentrations of methane and carbon dioxide was considered to be very low, and no gas protection measures were deemed necessary.

Recommendations

Based on the results of the site investigations, the following recommendations, specific to the protection of human health and the environment, were presented in the Phase 2 Report (MKO, 2022):

- The risks to future occupants posed by asbestos, lead, and PAHs can be mitigated through the provision of barrier layers in areas where contaminated soils are to remain. These barrier layers may consist of the future development footprint (e.g. buildings, tarmac/concrete hardstanding) or engineered capping layers in communal landscaping areas.
- In proposed communal soft landscaping areas overlying existing soils, suitable topsoil and subsoil should be provided to form a capping layer that acts both as a barrier to underlying contamination and as a growth medium. The capping layer could comprise either 600 mm of imported soil, including a minimum of 150 mm topsoil, or 450 mm of imported soil including 150 mm topsoil over a geotextile membrane.
- If soil excavation is required to facilitate construction of basements, foundations, or buried services in contaminated areas, soil samples should be submitted for chemical analysis to confirm the absence of residual contamination. Excavated soil should be removed from site for treatment or disposal at a licensed waste facility. Additional validation samples should be collected to confirm that a 'clean edge' has been reached in the excavation area.
- Should groundwater be encountered during earthworks or piling operations, dewatering may be necessary. Contaminated groundwater may require offsite disposal at a licensed waste facility or treatment via a three-stage interceptor prior to discharge to the foul sewer, subject to a discharge licence from the local authority.
- Results from gas monitoring indicate that the site corresponds to Characteristic Situation 1, representing a very low risk. Therefore, no gas protection measures are required for future development.
- In accordance with current UKWIR16 guidance, the use of barrier pipes for water supply may be required in certain areas of the site to prevent potential permeation of contaminants into drinking water supplies.

#### *6.3.7.4 Site Investigations – 2024 (GII)*

To inform the design and consider the potential effects of the Proposed Development, additional site investigations were carried out by GII, between July 2024 and September 2024 on the instructions of TOBIN, on behalf of the Land Development Agency (LDA), the applicant. The purpose of the site investigations was to investigate subsurface conditions utilising a variety of investigative methods in accordance with the project specification and included the following:

- Excavation of fifteen (15 No.) trial pits to a maximum depth of 4.0mbgl.
- Drilling of nine (9 No.) cable percussion boreholes to a maximum depth of 6.8mbgl with follow on with rotary core boreholes to a maximum depth of 14.0mbgl at the same locations.
- Installation of an additional three (3 No.) groundwater monitoring wells.
- Collection and submission of sample for laboratory analysis.

The site investigation locations are presented in Figure 6-12.

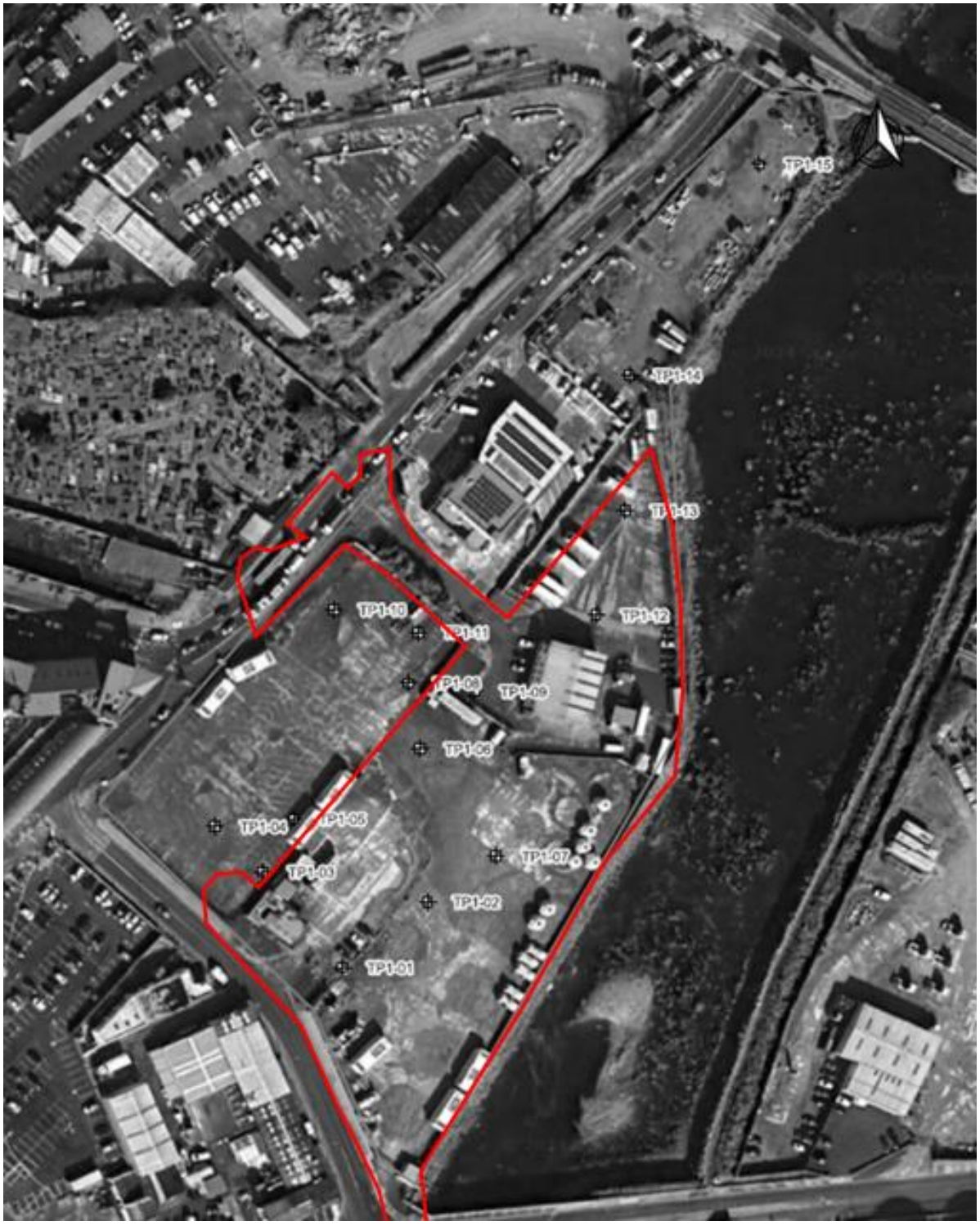



*Figure 6-12 Site Investigations Locations (GII, 2024)*

Ground Conditions

The sequence of strata encountered were relatively consistent across the site and consistent with previous site investigations (RSK, 2009, MKO, 2019 and MKO, 2022).

The ground conditions encountered are summarised as follows:

- Surfacing - Concrete was encountered to a maximum depth of 0.03mbgl and tarmacadam was encountered to a maximum depth of 0.05mbgl. When those were absent, crushed rock FILL was encountered to a maximum depth of 0.90mbgl.
- Made Ground - Beneath the surfacing layer to a depth of up to 9.45mbgl. Generally described as clayey sandy subangular to subrounded fine to coarse Gravel with medium cobble content and rare fragments of metal, brick, ceramic, timber, concrete, plastic to grey angular Cobbles and Boulders with a lot of slightly clayey sandy angular Gravel.
- Possible Made Ground - beneath the Made Ground in BH1-03, BH1-05, BH1-08 and BH1-09 and were described as light brown slightly sandy slightly gravelly silty CLAY with low cobble content.
- Bedrock – Two types of bedrock, strong to very strong foliated dark greenish grey fine to coarse grained Metagabbro and strong to very strong massive pink/red/brown stained grey fine to coarse grained Granite. The depth to bedrock varied from 5.80mbgl in BH1-04 to 9.45mbgl in BH1-09.

Laboratory Analytical Results

A total of forty-eight (48 No.) soil samples, collected from fifteen (15 No.) trial pits at varying depths from 0.0mbgl to 3.0mbgl, were analysed for a suite of parameters which allows for the assessment of the sampled material in terms of total pollutant content for classification of materials as hazardous or non-hazardous.

The laboratory suite included analysis of metals (i.e., arsenic, barium, cadmium, chromium, copper, cyanide, lead, nickel, mercury and zinc), pH, sulphate, sulphide, moisture content, soil organic matter and an asbestos screen. The suite also included those parameters specified in the EU Council Decision establishing criteria for the acceptance of waste at Landfills (Council Decision 2003/33/EC), as TOCs, speciated aliphatic and aromatic petroleum hydrocarbons, BTEX, phenol, PCBs and PAHs.

The soil results reported detections of mineral oil, total petroleum hydrocarbons (TPHs), benzene, toluene, ethylbenzene, m&p-xylene, o-xylene and methyl tert-butyl ether, polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs) across eight (8 No.) of the sample locations (i.e., TP1-01, TP1-02, TP1-03, TP1-04, TP1-05, TP1-06, TP1-10 and TP1-12).

#### *6.3.7.5 Waste Classification – 2025 (GII)*

A Waste Classification Assessment (WAC) was undertaken for the Proposed Development in 2025. All site investigation works were completed in July 2024, refer to Section 6.3.7.4.

All samples were assessed in terms of waste classification using the HazWasteOnLineTM tool and also the WAC set out in Council Decision 2003/33/EC and the EPA's increased WAC to give a final waste categorisation to determine the most appropriate disposal route for any waste generated. Based on the results of the HazWasteOnLineTM tool seven (7 No.) of the samples analysed if being considered a waste can be classified as hazardous (GII, 2025).

- The non-hazardous material across the site if excavated should be removed from site to an appropriate facility under either the LoW codes 17 05 04 or 17 09 04. Where during excavation there is noted to be in excess of 2% anthropogenic material the appropriate LoW code which should be applied is 17 09 04 (GII, 2025).

- The hazardous material across the site if excavated should be removed from site to an appropriate facility under either the LoW codes 17 05 03 or 17 09 03. Where during excavation there is noted to be in excess of 2% anthropogenic material the appropriate LoW code which should be applied is 17 09 03 (GII, 2025).

### 6.3.8 Geochemical Domain

The Geological Survey Ireland (GSI), in collaboration with the Environmental Protection Agency (EPA), has developed Geochemically Appropriate Levels (GALs) for soil recovery facilities across Ireland, specifically addressing metals and metalloids in uncontaminated soil and stone (GSI, 2025). These GALs are defined across seven geochemical domains nationwide. According to the GSI's Geochemical Domains map (GSI, 2025), no geochemical domain is assigned to the majority of the site area, as it primarily comprises reclaimed land. However, the closest defined domain, covering the northeastern portion of the site, is Geochemical Domain 6, which is characterised as 'Granite Rocks'

A summary of the GALs for metals values in Domain 6 are presented below in Table 6-4.

*Table 6-4 Geochemically Appropriate Levels for Domain 6*

| Element | Units | Value |
|---|---|---|
| Arsenic | mg/kg | 85.80 |
| Cadmium | mg/kg | 2.38 |
| Chromium | mg/kg | 54.00 |
| Copper | mg/kg | 40.00 |
| Mercury | mg/kg | 0.53 |
| Nickel | mg/kg | 28.20 |
| Lead | mg/kg | 108.00 |
| Zinc | mg/kg | 168.00 |

### 6.3.9 Radon

The Radon Risk Map of Ireland (EPA, 2025) shows a prediction of the number of the 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. Refer to Figure 6-13.

As the site primarily comprises reclaimed land, the majority of the area is not considered at risk from radon. However, a small portion along the northwestern boundary and some outlying lands are mapped by the EPA 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 national reference level for radon as 200 Bq/m$^3$ and defines a High Radon Area where more than 10% of homes may have more than the reference level of radioactivity. This is discussed further in Section 6.5.2.

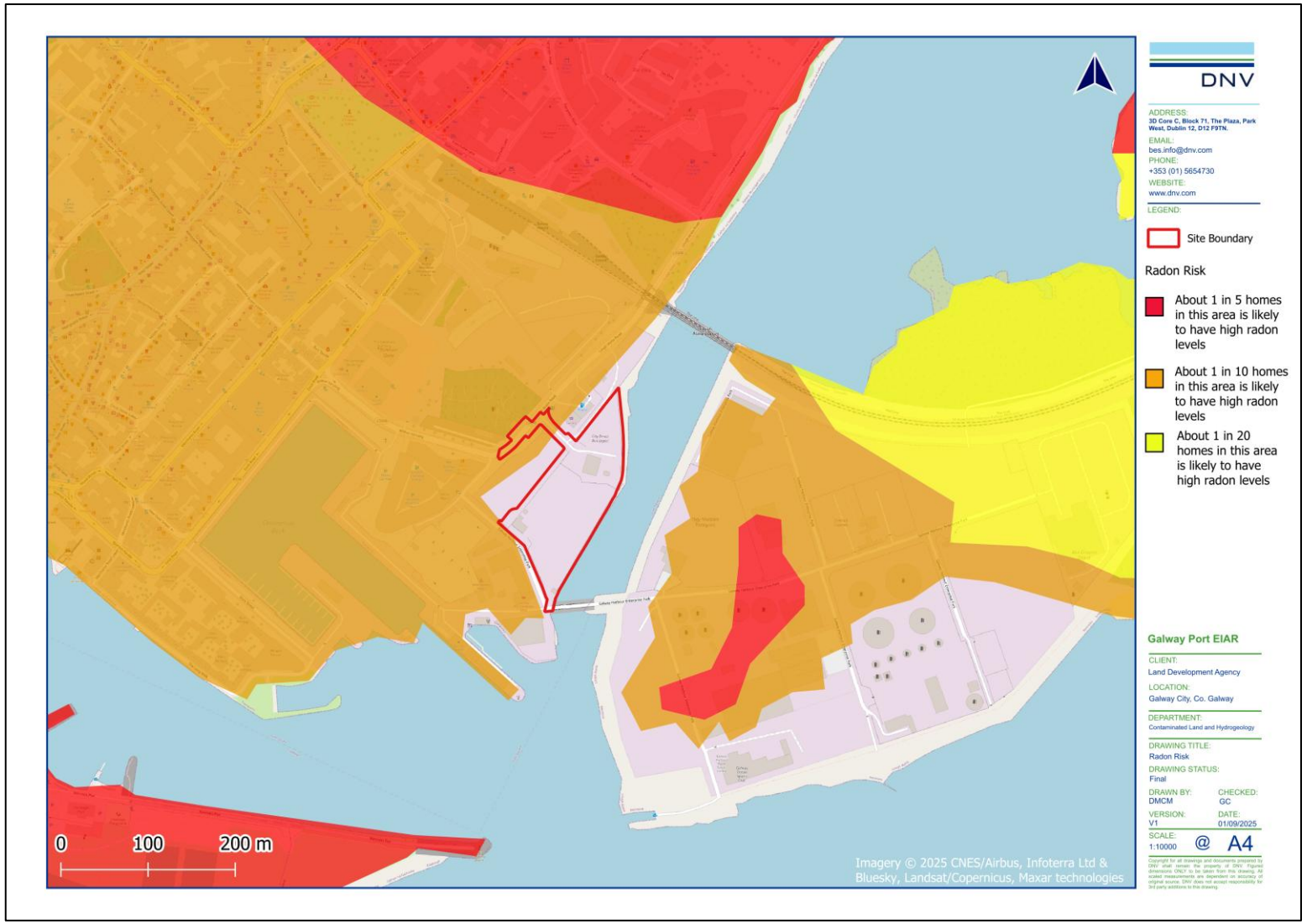



*Figure 6-13 Radon Risk Map*

### 6.3.10 Geohazards

The GSI (GSI, 2025) records indicate that there are no karst features within the 2km radius of the Proposed Development site. The closest karst feature (spring) to the site is located approximately 2.97km east of the site.

The site of the Proposed Development and surrounding lands are located within an area with a 'low' landslide susceptibility and along the northern boundary of the site, the area is classified a 'low (inferred)' (GSI, 2025). There are no landslides recorded on the GSI database at the site (GSI, 2025).

In Ireland, seismic activity is recorded by the Irish National Seismic Network operated by Dublin Institute for Advanced Studies (DIAS) which has been recording seismic events in Ireland since 1978. There are six 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 or the Galway Bay region.

### 6.3.11 Geological Heritage Sites

There are four (4 No.) geological heritage sites mapped by the GSI (GSI, 2025) within the 2km radius of the site. The closest identified geological heritage site is described as St. Augustine's Well 0.6km north-east of the site boundary. Refer to Figure 6-14.

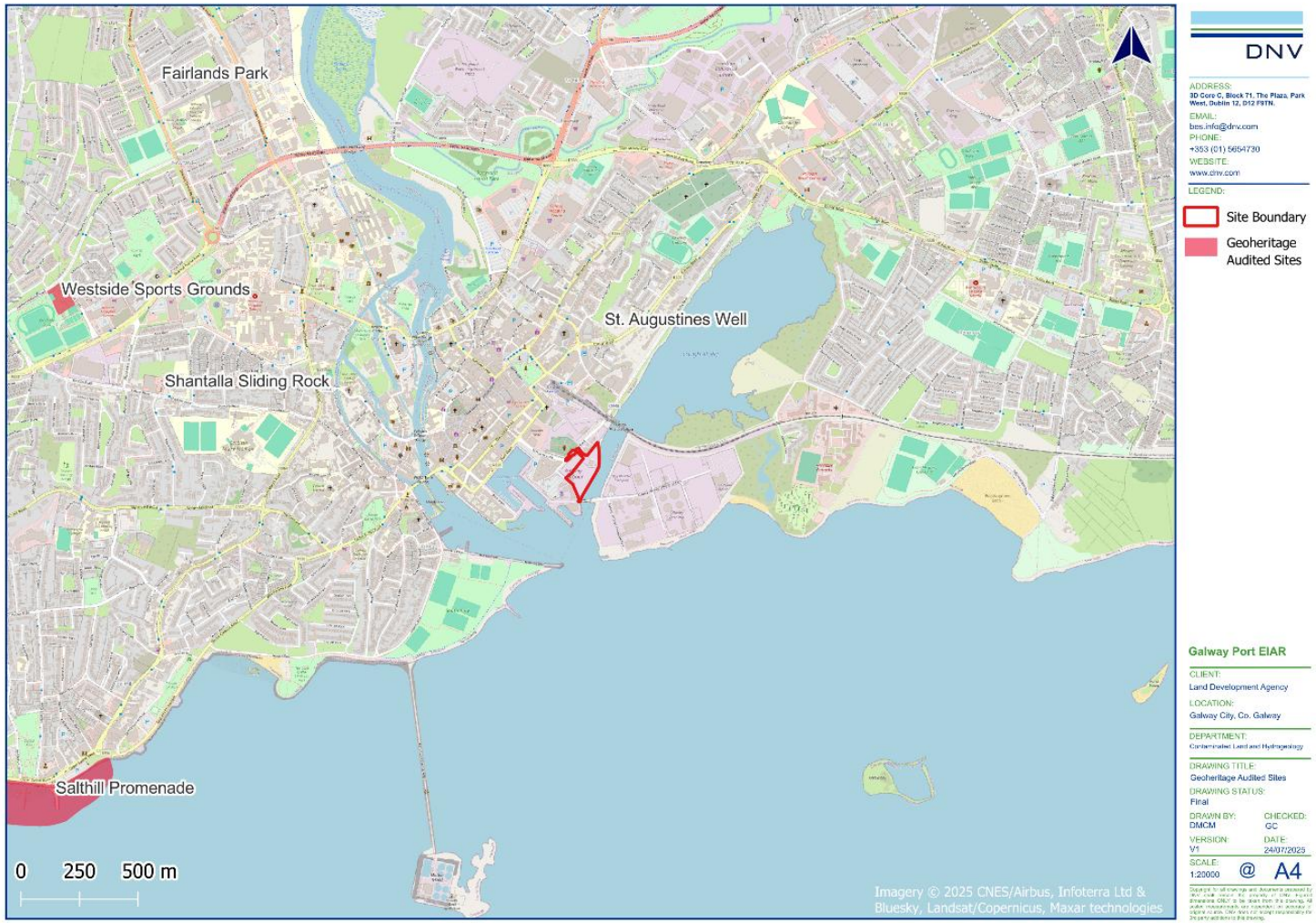



*Figure 6-14 Geological Heritage Sites*

### 6.3.12 Economic Geology

The lands beneath the site are mapped by the GSI (GSI, 2025) as having no mapped granular aggregate potential. The bedrock beneath the majority of the site has been identified by the GSI (GSI, 2025) as having no crushed rock aggregate potential, likely due to the fact the land is reclaimed. A small portion of the northwest of the site has been identified as having “low potential” (GSI, 2025). Refer to Figure 6-15.




*Figure 6-15 Aggregate Potential*

### 6.3.13 Importance of Baseline Environment

The site is a brownfield site. The subsoils are mapped by the GSI (GSI, 2025) as having no granular aggregate potential. The bedrock is classified as having no crushed rock aggregate potential with the exception of a small part of the northwestern boundary of the site.

Taking into account the attributes of the soil and geology underlying the site, the absence of geological heritage sites, quarries and pits within 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 underlying the Proposed Development site would be rated as having an overall 'low' geological importance.

## 6.4 Characteristics of the Proposed Development

A comprehensive description of the Proposed Development is outlined in Chapter 2 (Description of the Proposed Development) of this EIAR.

The following components are of particular relevance with respect to land, soils and geology are discussed below.

### 6.4.1 Construction Phase

The construction phase of the Proposed Development will include:

- The GII report (GII, 2024) recommended the use of pile foundations for the proposed structures at the site given the presence of made ground across the site. Additionally, it was recommended that the floor slab should be suspended and also supported on the building piles. As stated in the GII report (GII, 2024) in regard to the short-term temporary excavations in the cohesive deposits, the excavations will remain stable, for a limited time only and will require to be appropriately battered or the sides supported if the excavation is below 1.25mbgl.
- Excavation of soil and subsoil will be required to allow the construction of roads, building foundations, drainage, and ancillary services. Excavation depths will range from 2.398mbgl to 3.994mbgl.
    - It is estimated by TOBIN that approximately 11,594.268m$^3$ of soil and subsoil including made ground will be excavated as part of remedial excavations at the site (refer to Drawing No. 11910-2015 & 11910-2016 submitted with the planning application under separate cover).
    - An additional 4,469.252m$^3$ will be excavated to achieve formation levels, which will be reused onsite (refer to Drawing No. 11910-2015 & 11910-2016 submitted with the planning application under separate cover).
    - Where possible, excavated soil and subsoil materials will be reused for engineering fill and landscaping subject to assessment of their suitability for use in accordance with engineering and environmental specification for the Proposed Development. It is estimated that 4,469.252m$^3$ of material excavated during bulk excavations to achieve formation levels will be re-used onsite. However, all soil and subsoil materials, including made ground excavated as part of remedial excavations (approximately 11,594.268m$^3$), will be removed from the site. This material will be taken for appropriate offsite reuse, recovery, recycling and / or disposal in accordance with the procedures outlined in the Resource and Waste Management Plan (AWN, 2025).

  - It is anticipated that there will be no requirement for the excavation of bedrock during the construction stage of the Proposed Development.
- The volume of fill required to achieve formation levels is approximately 10,353.52m$^3$. The importation of approximately 5,884.268m$^3$ soil and subsoil materials will be required for the construction of the Proposed Development. Contract and procurement procedures will ensure that all imported soil and subsoil materials required will be sourced from reputable suppliers operating in a sustainable manner and in accordance with industry conformity/compliance standards and statutory obligations.
- The demolition of the existing structures and removal of hardstanding areas onsite will also be required. This material will be taken for appropriate offsite reuse, recovery, recycling and / or disposal in accordance with the procedures outlined in the Resource and Waste Management Plan (AWN, 2025).
- Temporary stockpiling of excavated material will be required pending reuse onsite (where required), or removal offsite.
- There may be a surplus of building materials, such as timber off-cuts, broken concrete blocks, cladding, plastics, metals and tiles generated and there may also be excess concrete during construction which will need to be disposed of (AWN, 2025).
- The importation of aggregate fill materials will be required for the construction of the Proposed Development (i.e., natural stones and gravel, aggregates, and related fill products). All aggregate materials will be sourced from locally available quarries in accordance with the appropriate statutory guidelines.

### 6.4.2 Operational Phase

The operational stage of the Proposed Development will consist of the typical activities in a residential development and there will be no bulk excavation of soils or bedrock or infilling of waste.

The land use at the site will change from brownfield site to residential, creche, retail and cafe/restaurant development with associated vehicular and pedestrian access, car parking and landscaping.

The Proposed Development will comprise the development of residential apartment blocks, a crèche, two (2 No.) retail/café units and one (1 No.) retail unit, and will be covered with hardstanding, as well as areas of landscaping and public/communal open space. As recommended in the MKO report (2022), following the findings of the additional site investigations undertaken for the site, the landscaped areas will comprise either 600mm of imported soil including minimum 150mm topsoil or 450mm imported soil including 150mm topsoil over a geotextile (MKO, 2022). However, the details of these measures are to be developed during the detailed design stage.

There will be no requirement for bulk storage of petroleum hydrocarbon-based fuels during the operational phase, as the main operating systems for heating will be a communal (centralised) heat pump solution which delivers better energy performance or Exhaust Air Heat Pump (EAHP) solution. Further details are provided in Chapter 13 of this EIAR.

## 6.5 Potential Effect of the Proposed Development

The procedure for determination of potential effects on the receiving land, soils and geology is to identify potential receptors within the 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 affected 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.

### 6.5.1 Construction Phase

The potential effects associated with the construction phase of the Proposed Development are summarised below.

#### *6.5.1.1 Land Take and Land Use*

The Proposed Development will require approximately 1.621ha of land, transitioning its use from a brownfield site to a mixed-use.

The change in land use is in accordance with the zoning objectives as set out in the current Galway City Development Plan 2023 – 2029 (GCC, 2023). Further details regarding the legislative context and alignment with strategic, national, regional, and local planning policies and objectives are provided in Chapter 3 of this EIAR.

As a result, the development will involve an unavoidable land take, leading to a 'neutral', 'slight', and 'permanent' effect on land and soil, particularly when assessed in the context of surrounding land uses at the site comprising a surfacing layer (concrete) and a made ground layer beneath the concrete and the zoning objectives. This is considered non-significant in the context of the EIA Directive.

#### *6.5.1.2 Excavation and Removal of Soil and Subsoil*

It is anticipated that there will be no requirement for the excavation of bedrock during the construction phase of the Proposed Development. However, there will be an unavoidable loss of in-situ soils and subsoils from the site to achieve the formation levels for the Proposed Development including building foundations, roads, drainage and other infrastructure.

Where possible, excavated soil and subsoil materials will be reused for engineering fill and landscaping, subject to assessment of their suitability for use in accordance with engineering and environmental specifications for the Proposed Development. However, it is estimated that approximately 11,594.268m$^3$ of soil and subsoil including made ground will be excavated as part of remedial excavations at the site and will be removed offsite for disposal to a licensed facility.

Previous site investigations (RSK, 2009, MKO, 2019, MKO, 2022 and GII, 2024) have reported concentrations of lead and benzo(a)pyrene in excess of the applicable GACs for residential (without gardens) land use scenario. Detectable concentrations of mineral oil, TPHs, benzene, toluene, ethylbenzene, m&p-xylene, o-xylene and methyl tert-butyl ether, other speciated PAHs and PCBs have also been reported in Made Ground soils beneath the site. The excavation of Made Ground soils impacted with anthropogenic contamination and permanent removal offsite is a design requirement of the Proposed Development. Furthermore, as part of incorporated design measures for the Proposed Development in-situ soil validation samples will be collected to ensure that residual contamination in soil has been removed offsite. Accordingly, it is considered that there will be a 'positive', 'moderate to significant' and

'permanent' impact on the quality of shallow soils underlying the site. Therefore, there is no significant adverse, effect in the context of the EIA Directive associated with the excavation of soil from the site.

During excavations at the Proposed Development site, there is a potential risk of contaminants leaching from the soil into the shallow groundwater. Excavation activities may disturb contaminated soils, increasing the likelihood of contaminant mobilisation. Additionally, the exposure of contaminated soils to rainfall and surface water runoff can further enhance the leaching of contaminants from unsaturated soils. Construction best practices, including the implementation of the Construction Environmental Management Plan (CEMP) (prepared by DNV (DNV, 2025) and submitted with the planning application under separate cover), detailing the management and disposal procedures of excavated materials, will reduce the risk of contaminant leaching. However, in a worst-case scenario, the mobilisation of soil contamination beneath the site could adversely impact the receiving hydrogeological and hydrological environment, depending on the nature of the incident and in the absence of standard avoidance and design measures. The potential impacts of soil contamination on the receiving water environment are assessed in Chapter 7, Section 7.6.1.2, of this EIAR.

There is a potential risk of adverse effects on site workers from exposure to soil contamination. Furthermore, asbestos containing material (ACM) (amosite and chrysotile fibre bundles) were identified in the Made Ground during the site investigations undertaken in 2019 to a maximum depth of 2mbgl (MKO, 2019) outside of the Proposed Development site boundary (refer to Figure 6-8). ACM was not identified in samples tested from the Made Ground within the site boundary during the site investigation in 2022. Nevertheless, given the presence of asbestos in the wider area surrounding the site, there remains a potential for asbestos to be present at the site. Therefore, there is a potential risk to the health of construction personnel during the construction phase of the Proposed Development. As the exposure will be temporary or short-term during construction, the effect is likely to be negligible, and the overall significance is anticipated to be insignificant. The potential risks to construction workers will be further considered as part of the construction management plans including the CEMP prepared and updated by the appointed contractor in advance of construction work commencing and will be managed via the implementation of effective mitigation measures appropriate the risks. Potential effects to human health are addressed at Chapter 4 of this EIAR.

Contaminated soil, soil not suitable for re-use onsite and other waste materials arising during the construction phase will be removed off-site by an authorised contractor and sent to the appropriately authorised (licensed/permitted) receiving waste facilities. As only authorised facilities will be used, the potential impacts at any authorised receiving facility sites will have been adequately assessed and mitigated as part of the statutory consent procedures. The potential effect with removal offsite of surplus soil and other material as waste is assessed in Chapter 13 of this EIAR.

#### *6.5.1.3 Soil Quality and Contamination*

**Reuse of Soil**

Previous site investigations (RSK, 2009, MKO, 2019, MKO, 2022 and GII, 2024) have reported concentrations of lead and metals in excess of the applicable GACs for residential (without gardens) land use scenario. It is anticipated that approximately 11,594.268m$^3$ of soil and subsoil, including made ground, will be excavated, during bulk excavations for the Proposed

Development, as part of remedial excavations at the site. Furthermore, as part of incorporated design measures for the Proposed Development in-situ soil validation samples will be collected to ensure that residual contamination in soil has been removed offsite. Regardless, the re-use of any soil onsite will be subject to control procedures which will include soil quality testing to ensure suitability for use onsite and in accordance with engineering and environmental specification for the Proposed Development. Therefore, the reuse of any excavated soil for the Proposed Development will have an 'neutral', 'imperceptible' and 'permanent' impact given that it will have undergone 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. This is considered non-significant in the context of the EIA Directive.

**Piling**

It is noted that piling during the construction phase of the Proposed Development, may potentially create pathways for contaminants including sources of contamination in shallow soils (leachate), groundwater and leachates or other materials including grout to enter underlying hydrogeological environment. The potential effect with piling during the construction phase of the Proposed Development is assessed in Chapter 7, Section 7.6.1.2, of this EIAR.

**Concrete Works**

There is a potential risk associated with the use of cementitious materials during construction of subsurface structures (such as foundations) on the underlying soil and geology at the Proposed Development site. It is considered that this may result in a 'negative', 'moderate' and 'long-term' effect on existing quality of soil within a localised area underlying the site and is considered significant in the context of the EIA Directive.

**Handling of Fuels and Hazardous Materials**

The potential accidental release of deleterious materials including fuels and other materials being used onsite, through the failure of secondary containment or a materials' handling accident on the Proposed Development site 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. It is noted that this effect 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 excavation and limited reuse of soil at the site, where possible, will result in the exposure of the materials 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). Over time, the soil may become less cohesive and more prone to erosion and instability.

The combined effects of exposure to elements, construction traffic, and temporary stockpiling will have a potential 'negative,' slight' and 'long term' effect on the geotechnical properties of the materials and is considered non-significant in the context of the EIA Directive.

#### *6.5.1.5 Importation of Fill Materials*

An estimated imported volume of 5,884.268m$^3$ of aggregate fill materials (e.g., construction of the piling material and granular material beneath road, pavement, under floor slabs and for drainage and utility bedding / surrounds) and suitable topsoil and subsoil (to form a capping layer to act as a barrier to any underlying residual contamination) will be required for the construction of the Proposed Development. The potential effects may include loss of attributes and changes in the geological regime at the source site. It is anticipated that the potential effect posed from the aggregates and soil materials identified for importation onsite will be 'indirect' and have a 'neutral,' 'imperceptible' and 'permanent' effect on the source site. This effect is considered imperceptible and non-significant in the context of the EIA Directive taking account the fact that the statutory consent process will require the necessary environmental effects to be assessed and mitigated as appropriate at the source site.

#### *6.5.1.6 Dust Generation*

There is a potential for the creation of windblown dust from the temporary stockpiling of materials onsite. There will be some exhaust emissions generated from the use of excavators, HGVs (heavy goods vehicles) and vibrating rollers during the construction phase of the Proposed Development. Appropriate mitigation measures are detailed in the CEMP for the project where applicable. An assessment of the potential effect of the Proposed Development with regard to the generation of dust is addressed in Chapter 8 (Section 8.5) of this EIAR.

#### *6.5.1.7 Geological Hazards*

Galway City and its surrounding areas are characterised by a unique karst landscape defined by limestone formations and geological features. No evidence of karst features was identified during the previous site investigations (RSK, 2009, MKO, 2019, MKO, 2022 and GII, 2024). Therefore, there is no identified risks associated with karst features. Furthermore, the design and specification for all buildings will be in accordance with current Building Regulations and, therefore, avoiding any potential risks associated with karst features. The predicted effects are considered to be imperceptible and not significant in the context of the EIA Directive.

The previous site investigations (RSK, 2009, MKO, 2019, MKO, 2022 and GII, 2024) did not reference any issues associated with pyrite. All aggregates imported to the site for use in the Proposed Development will be subject to strict quality control procedures in accordance with the design specification and relevant Building Regulations, therefore avoiding any potential issues with pyrite and other deleterious material in aggregates. Therefore, the predicted effects are considered to be imperceptible and not significant in the context of the EIA Directive.

Overall, the effects of geohazard risks due to the Proposed Development are considered to be 'neutral' 'imperceptible' and 'permanent' and not significant in the context of the EIA Directive.

### 6.5.2 Operational Phase

During the operational phase of the Proposed Development there is a limited potential for any direct adverse effect on the receiving land, soil and geological environment at the site taking account of the design for the Proposed Development.

The design and construction of the Proposed Development will be undertaken in accordance with current Building Regulations which will ensure that the site will be suitable for use for the operational phase as a residential / commercial development taking account of the geological site setting.

Previous site investigations at the site have shown that elevated concentrations of lead, benzo(a)pyrene were present within the Made Ground across the site, which pose a low to medium risk to human health (MKO, 2022), based on residential (without gardens) end use scenario. It is anticipated that the majority of contaminated soils will be excavated during bulk excavations for the Proposed Development. Furthermore, as part of incorporated design measures for the Proposed Development, in-situ soil validation samples will be collected to ensure that residual contamination in soil has been removed offsite. Regardless, the footprint of the proposed buildings will prevent any future contact or exposure of any remaining contaminated soil. In addition, any areas which will be developed as public or communal open space (i.e., the landscaped courtyards and open spaces between the buildings) will be completed as necessary with imported clean soil to prevent site users from interacting with contaminated soil. The details of these measures will be developed during the detailed design stage. Accordingly, it is considered that there will be a 'neutral', 'imperceptible' and 'permanent' impact on future occupants of the site. Therefore, 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 to the Proposed Development. The GSI (GSI, 2025) database indicates that the Proposed Development site is located within an area of low susceptibility to landslides. Furthermore, there are no potential ground stability hazards identified for the site.

As the site primarily comprises reclaimed land, the majority of the area is not considered at risk from radon. However, a small portion along the northwestern boundary and some outlying lands are mapped by the EPA as being in an area where 'about 1 in 10 homes in this area is likely to have high radon levels'. The design and specification for all buildings will be in accordance with current Building Regulations and, therefore, any potential issues associated with radon will be addressed and avoided. Therefore, the predicted effects are considered to be imperceptible and not significant in the context of the EIA Directive.

Overall, the predicted effects on the receiving land, soil and geological environment during the operational phase of the Proposed Development are considered to be 'neutral,' imperceptible' and 'permanent' and are not 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 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 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 (Description of the Proposed Development) of this EIAR were reviewed and considered for possible cumulative effects with the Proposed Development.

#### *6.5.3.1 Construction Phase*

**Excavation and Removal of Soil and Subsoil**

Excavated soil and subsoil during the construction phase of the Proposed Development could potentially be directed to the same receiving waste facilities for recovery / disposal as excavated materials from other developments detailed in Chapter 2 (Description of the Proposed Development) of this EIAR and within the wider Galway Area. All excavated soils and subsoils from the site will be removed offsite in accordance with the requirements of the Resource and Waste Management Plan (RWMP) (AWN, 2025) and project specific RWMP (which will be developed by the main contractor in advance of construction works commencing) and all statutory legislation. Accordingly, 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 aggregates and soil materials to the Proposed Development may be sourced from the same borrow site as other permitted developments detailed in Chapter 2 (Description of the Proposed Development) of this EIAR and within the wider Galway Area. However, contract and procurement procedures will ensure that all aggregates and fill material originating from quarry sources that will be required for construction are sourced from reputable authorised suppliers operating in a sustainable manner and in accordance with the necessary statutory consents. 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 environmental at the source site and 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.

#### *6.5.3.2 Operational Phase*

There will be no cumulative effects on land, soil and geology during the operational phase of the Proposed Development.

### 6.5.4 "Do Nothing" Effect

The 'Do Nothing' scenario assesses the potential effect on the receiving land, soils, and geological environment if the Proposed Development did not proceed.

In the 'Do Nothing' scenario, the site would remain as underutilised brownfield lands in the immediate term. However, the proposed change in land use is consistent with the Core

Strategy and wider planning and development strategy outlined in the Galway City Development Plan 2023 – 2029 (GCC, 2023). Therefore, the site would remain underutilised with underlying soils impacted with anthropogenic contamination. Furthermore, the excavation of made ground impacted by said anthropogenic contamination would not be undertaken. Residual sources of contamination in soil, if not removed offsite, could result in ongoing detriment to the underlying groundwater and receiving surface water receptors.

It is also noted that as the site is zoned for development, the potential for future development remains in the long term. As such, even in the absence of the Proposed Development, it is considered that the types of construction and operational phase effects assessed in this chapter of the EIAR may still occur in the future, albeit under a different development proposal. In this scenario, the current assessment remains relevant as an indication of the likely nature and scale of effects on land, soil and geology associated with residential development on the site.

## 6.6 Avoidance, Remedial and Mitigation Measures

The mitigation measures as outlined below, will ensure that there will be no significant impact on the receiving land, soil and geology.

### 6.6.1 Incorporated Design Mitigation

The excavation of soil and subsoil materials, including made ground excavated as part of remedial excavations (approximately 11,594.268m³), impacted with anthropogenic contamination and permanent removal offsite is a design requirement of the Proposed Development. As part of incorporated design measures for the Proposed Development in-situ soil validation samples will be collected to ensure that residual contamination in soil has been removed offsite.

Landscaping within public open / communal amenity space areas will comprise either 600mm of imported soil including minimum 150mm topsoil or 450mm imported soil including 150mm topsoil over a geotextile thereby removing any potential risks associated with direct contact of soils in the public open / communal amenity space areas (MKO, 2022). However, the details of these measures are to be developed during the detailed design stage.

### 6.6.2 Construction Phase Mitigation

During the construction phase, all works will be undertaken in accordance with the CEMP (DNV, 2025) and the RWMP (AWN, 2025). 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 CEMP 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.

#### *6.6.2.1 Management of Contaminated Soil*

As documented in the MKO report (MKO, 2022), the concentrations of the parameters analysed within the 'natural ground' were below the specific assessment criteria (i.e.,

Residential (without Private Gardens) and Commercial) and therefore were not considered to present an unacceptable risk to human health. However, due to the elevated concentrations of lead and PAHs noted in the Made Ground it was considered that the potential risks to future occupants via dermal contact, inhalation and ingestion pathways can be mitigated through the provision of a suitable barrier layers (i.e. the footprint of the proposed buildings, hardstanding for roads and pavements or capping layers in soft landscaping areas). It is anticipated that the majority of contaminated soils will be excavated during bulk excavations for the Proposed Development. Nevertheless, as part of incorporated design measures for the Proposed Development in-situ soil validation samples will be collected to ensure that residual contamination in soil has been removed offsite. The removal of the residual soil source will be undertaken under supervision of the Project Environmental Consultant and validated in accordance with relevant guidelines including EPA 'Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites' (EPA, 2013a) and guidance and standards current at the time of construction works to ensure that a 'clean edge' is reached in the area of excavation.

The management and removal of soils offsite will be undertaken in accordance with the GII Waste Classification Report (July 2025), the Waste Management Act 1996 -2011 as amended and associated regulations and guidance. Where required (i.e., in the event that there is evidence of contamination during the excavation of the soils), additional sampling and waste classification assessment of potentially contaminated soil to be excavated will be undertaken in advance of construction works commencing.

All works will be undertaken by the appointed contractor in accordance with industry best practice to manage risk from contaminated soils and groundwater. These will be designed by the appointed contractor dependent on their construction practices and are likely to include the use of gloves, dust masks and potentially disposable overalls. These and other appropriate measures will minimise the exposure of the site workers.

In the event that hazardous soil, or historically deposited waste is encountered during the construction phase or in the unlikely event soil becomes contaminated, for example, by a fuel spill onsite or a burst / leaking hydraulic hose, the Main Contractor will ensure that the management of contaminated material is undertaken in accordance with the procedures outlined in Section 9 of the CEMP (DNV, 2025). Where required, the Main Contractor will instruct the Project Environmental Consultant to attend the site and complete an environmental site assessment in accordance with BS 10175:2011+A2:2017 Investigation of Potentially Contaminated Sites – Code of Practice and the requirements set out in Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous, (EPA, 2018). Contaminated soils excavated and removed from the site for treatment or disposal within a licensed waste facility.

#### *6.6.2.2 Asbestos*

ACMs were identified in the Made Ground during the site investigations undertaken in 2019 (MKO, 2019) outside of the boundary of the Proposed Development site (refer to Figure 6-8). While ACMs were not identified in samples tested from the Made Ground within the site boundary during the subsequent site investigations in 2022 or 2024, given the presence of asbestos in the wider area surrounding the site, the potential for asbestos to be present at the site has been considered.

The potential risks to construction workers will be further considered as part of the construction management plans including the CEMP prepared and updated by the appointed contractor in advance of construction work commencing and will be managed via the implementation of effective mitigation measures appropriate the risks. The risk posed to construction workers will be minimised by the use of appropriate health, safety and welfare provisions. These include but are not limited to good site hygiene and the use of appropriate personal protective equipment (PPE).

Where Asbestos Containing Materials (ACMs) are found within the excavated material, the removal will only be carried out by a suitably permitted waste contractor, in accordance with the Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010. All asbestos will be taken to a suitably licensed or permitted facility.

An asbestos demolition survey will be undertaken prior to the demolition of the existing buildings onsite. If asbestos is encountered onsite (i.e., during demolition or excavation works), a suitably permitted/licenced waste contractor will be employed to remove the asbestos from the site in accordance with the Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010 and the Best Practice Guidance for Handling Asbestos (2023). All material will be taken to a suitably licensed or permitted facility.

#### *6.6.2.3 Reuse of Soil*

It is anticipated that the majority of soil and subsoil including contaminated soils will be excavated during bulk excavations for the Proposed Development and removed offsite in accordance with the RWMP and all statutory legislation. However, when soil and subsoil materials are reused within the Proposed Development (i.e., for engineering fill and landscaping), they will be subject to an assessment of their suitability for use in accordance with engineering and environmental specification for the Proposed Development. This will include:

- Define the criteria by which the suitability of the soils for reuse will be assessed (e.g., analytical parameters and limits), the engineering requirements such as geotechnical parameters for the material to be used within the works.
- Delineation of areas where excavated soil is intended for disposal offsite as waste or contaminated material, and where it is intended for reuse on site.
- Identification and recording of the location from where the soil will be excavated and its proposed reuse location and function.
- Engineering assessment to confirm its suitability for reuse.
- Any proposed treatment or processing required to enable its reuse, as well as any associated treatment permits, or licences required.
- All topsoil stripping associated with the Proposed Development will be monitored by a suitably qualified licensed archaeologist making sure to include any non-natural subsoil deposits to ensure that any potential archaeological features are exposed in the works. The licensed archaeologist onsite will be responsible, on behalf of the developer, for the identification and appropriate treatment (e.g. excavation and recording) of all archaeological remains encountered. The results of all excavations, including site evaluation and monitoring, will be compiled into a fully illustrated report

#### *6.6.2.4 Management and Control of Soils and Stockpiles*

Any construction and demolition waste generated from construction activities will be managed in accordance with the procedures which will be outlined in the CEMP (DNV, 2025) and RWMP (AWN, 2025) and will be stored onsite in such a manner as to:

- Prevent environmental pollution (bunded and/or covered storage, minimise noise generation and implement dust/odour control measures, as may be required).
- Maximise waste segregation to minimise potential cross contamination of waste streams and facilitate subsequent reuse, recycling and recovery.
- Prevent hazards to site workers and the general public during the construction phase (largely noise, vibration and dust).

Stockpiling of excavated materials, waste materials generated at the site or construction materials (e.g., imported aggregates, pipework, etc.) will be kept to a minimum. However, when stockpiling of materials at the site is necessary for disposal offsite the material will be segregated and temporarily stored onsite pending removal in accordance with the CEMP (DNV, 2025) which will be finalised by the main contractor (once appointed) in advance of construction works commencing.

Where possible, stockpiling of soil and stone onsite will be avoided. However, in the event that stockpiling is required, stockpiled materials, pending reuse onsite or removal offsite, will be located away from the location of any sensitive receptors (i.e., drains / watercourses / etc.). Temporary storage areas will be located at least 10m away from any waterbodies (i.e., the Corrib Estuary and the River Corrib) and open drainage channels which will be protected for the duration of the works (i.e., surrounded with silt fencing) or temporary diversion put in place.

When a stockpile has been sampled for re-use or waste classification purposes, it will be considered to be complete, and no more soil will be added to that stockpile prior to removal. An excavation/stockpile register will be maintained on-site.

The reuse of suitable excavated soil and subsoil for the Proposed Development (i.e., landscaping or engineering) will be undertaken in accordance with the engineered design and landscape plan for the Proposed Development.

Stockpiling of excavated material (i.e., soils and subsoils) shall be avoided. However, where required (i.e., awaiting reuse onsite, if required, or removal offsite), it will be appropriately managed onsite during the construction phase of the Proposed Development in accordance with the measures outlined in the CEMP (DNV, 2025). 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.
- Stockpiled materials will be protected from exposure to wind by storing the material in sheltered regions of the Site.
- Soil waste categories will be individually segregated and all segregation, storage & stockpiling locations will be clearly delineated on the Site drawing.
- Material identified for reuse on site, off site 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 run-off from the stockpiled material generation and/or the generation of dust.
- Material identified for reuse on site, if required, removal offsite and waste materials will be individually segregated.
- Topsoil shall not be stored in piles of greater than two metres in height as the soil matrix (internal structure) can be damaged beyond repair. It shall 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 such as residential areas etc.
- Soil stockpiles will be sealed / covered polythene sheeting with to prevent run-off of rainwater and silt from the stockpiled material generation and/or the generation of dust.
- Earthworks excavations shall be kept damp where necessary and where reasonably practicable.

#### *6.6.2.5 Import of Aggregates and Materials*

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. Therefore, any unsuitable material will be identified prior to unloading / placement onsite.

#### *6.6.2.6 Airborne Dust Generation*

Dust and fine particle generation from construction and demolition activities on the site will be substantially reduced through the selection of adequate mitigation techniques and effective management as detailed in the CEMP (DNV, 2025). The most effective technique is to control dust at source and prevent it from becoming air borne by implementing the following mitigation measures:

- Excavated soils 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 procures outlined in the CEMP 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. This may require additional wetting at

the point of dust release, dampening down during dry weather and wheel cleaning for any vehicles leaving the site.

- Vehicles travelling on any unsurfaced site roads shall have their speed restricted to 20 kph.
- Vehicles entering and leaving sites will be covered to prevent escape of materials during transport.
- All consignments containing material with the potential to cause air pollution being transported by skips, lorries, trucks or tippers must be covered (e.g., tarpaulin or similar) during transit onsite and offsite to restrict the escape of dust.
- Footpaths immediately around the site will be cleaned regularly, with damping as necessary.
- Dry sweeping of large areas shall be avoided.
- High level walkways and surfaces such as scaffolding shall be cleaned regularly using safe 'wet' methods, as opposed to dry methods.
- Vehicle waiting areas or hard standings will be regularly inspected and kept clean by brushing or vacuum sweeping and will be regularly sprayed to keep moist, if necessary.
- Dust dispersal over the site boundary shall be minimised using static sprinklers or other watering methods as necessary.
- Equipment and techniques for cutting / grinding / drilling / sawing / sanding etc, which minimise dust emissions and which have the best available dust suppression measures, shall be employed.
- Prior to commencement, the main contractor shall identify the construction operations which are likely to generate dust and to draw up action plans to minimise emissions, utilising the methods highlighted above. Furthermore, the main contractor shall prepare environmental risk assessments for all dust generating processes, which are envisaged.
- The main contractor will demonstrate full compliance with the dust control conditions at all times. Regular Toolbox Talks / briefings will be given to construction staff, sub-contractors, and operatives to raise awareness of the need to minimise dust.
- The implementation of dust suppression will be monitored, reviewed and any actions required addressed on an ongoing basis.
- At all times, the procedures put in place will be strictly monitored and assessed.
- The main contractor shall allocate suitably qualified personnel to be responsible for ensuring the generation of dust is minimised and effectively controlled.
- The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board shall also include head/regional office contact details.
- Where asbestos containing materials (ACMs) are encountered during demolition and excavation works, these will be managed in accordance with the Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006–2010 and the Construction Regulations 2013, including the use of licensed asbestos contractors, appropriate risk assessments, and safe removal and disposal procedures as outlined by the Health and Safety Authority.

Potential effects and avoidance and mitigation measures associated with generation of dust are addressed in Chapter 8 of this EIAR.

#### *6.6.2.7 Soil Structure*

The extent of the required work area and the bulk excavation at the site will be minimised where appropriate to prevent unnecessary excavation of soil and tracking over soil and subsoil outside of the excavation work 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 re-use onsite.

#### *6.6.2.8 Export of Resource (Soil and Subsoil) and Waste*

All surplus materials and any waste will be removed offsite in accordance with the requirements outlined in the CEMP (DNV, 2025) and RWMP (AWN, 2025) and will be managed in accordance the Waste Management Act 1996 -2011 as amended and associated regulations and guidance.

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.

Where appropriate, excavated soil and material intended for recovery or disposal offsite will require appropriate waste classification in order to select an appropriate receiving facility. Assessment of the excavated material will be carried out with due regard to the following guidance and legislation:

- Environmental Protection Agency document entitled Waste Classification; List of waste and determining if waste is Hazardous or Non-Hazardous.
- EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002).
- Environmental Protection Agency documented entitled Guidance on Waste Acceptance Criteria at Authorised Soil Recovery Facilities.
- Environment Agency, 2018. Technical Guidance WM3: Guidance on the classification and assessment of waste.
- Any other guidance or legislation that might be applicable or relevant at the time of disposal

The re-use of soil offsite will be undertaken in accordance with all statutory requirements and obligations including, where appropriate, re-use 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 re-use 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 (licensed/permitted) receiving waste facilities. 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 waste soils will be transported under a valid waste collection permit issued under the Waste Management (Collection Permit) Regulations 2007, as amended and will be delivered to an appropriately authorised waste management facility.

Prior to site works commencing, the CEMP (DNV, 2025) and RWMP (AWN, 2025) will be updated to reflect specific measures to minimise waste generation and resource consumption, including providing details of proposed waste contractors and destinations for each waste stream.

Materials and waste 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 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.

#### *6.6.2.9 Concrete Works*

The use of cementitious grout used 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 CEMP (DNV, 2025), and relevant industry standards to prevent effect 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:

- All ready-mixed concrete will be delivered to the site by truck.
- 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 will not 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.

#### *6.6.2.10 Handling of Fuels, Chemicals and Materials*

Fuelling and lubrication of equipment will be carried out in accordance with the procedures outlined in the CEMP (DNV, 2025), 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.

The storage and use of fuel and oils will be kept to a minimum at the site for the duration of the construction phase and will be strictly controlled in accordance with procedures outlined in the CEMP (DNV, 2025). 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.

- Refuelling of plant during the construction phase will be carried out in accordance with standard best practice. Onsite refuelling will not be undertaken within 50m of any open drains in the vicinity of the site which will be protected / temporary diversion put in place (i.e., sandbags) in order to prevent contamination of nearby waterbodies such as the Corrib Estuary transitional waterbody (Lough Atalia) which is adjacent to the site and the River Corrib which is located approximately 230 meters to the west of the site.
- Onsite refuelling will only be carried out at the out at the designated, impermeable refuelling station location onsite with appropriate containment in place. The refuelling station will be fully equipped for spill response and a specially trained and dedicated Environmental and Emergency Spill Response Team will be appointed before the commencement of works at the site.
- 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.
- 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.
- 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.
- Any fuels retained on drip trays, mobile bunds, etc., will be emptied into a secure bunded waste oil drum to await appropriate disposal offsite in accordance with all relevant waste management legislation.
- Heavy machinery used on the site will also be equipped with its own spill kit.
- 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.
- Suitable bunded areas will be installed for oil and petrol storage tanks.
- Designated fuel filling points will be put in place with appropriate oil and petrol interceptors to provide protection from accidental spills.
- Spill kits will be provided by the main contractor to cater for any other spills.
- Where contractors are required to refuel vehicles, this will only be carried out at the designated refuelling location within the site storage compound, which must employ pollution control mechanisms to prevent escape of fluids to the river. No refuelling will be permitted on site, i.e. within or adjacent to any waterbody, specifically the Corrib Estuary transitional waterbody (Lough Atalia) and drainage ditches, due to risk of spillage.
- The local authority will be informed immediately of any spillage or pollution incident that may occur on-site during the construction phase.

#### *6.6.2.11 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) 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.

#### *6.6.2.12 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.

Any connection to the public foul drainage network during the construction phase of the Proposed Development will be undertaken in accordance with the necessary temporary discharge licences issued by Uisce Eireann (UE).

### 6.6.3 Operational Phase

There is no requirement for mitigation measures for the operational phase taking account of the incorporated design measures for the Proposed Development. It is concluded that there will be no likely significant effects on the receiving land, soil, or geological environment during the operational phase. The predicted effects are considered to be imperceptible and not significant in the context of the EIA Directive. Therefore, there is no requirement for mitigation measures for the operational phase.

### 6.6.4 "Worst Case" Scenario

The potential accidental release of hazardous material including fuels, or other hazardous materials being used onsite during the construction phase could potentially affect the receiving land, soil and geology environment. This scenario would only occur through the failure of secondary containment or a major incident on the site. The potential for or inadvertent import of contaminated materials during the construction phase could also result in an effect in the absence of the quality control measures. However, taking account of the mitigation measures any environmental harm would be avoided.

In a worst-case scenario the mobilisation of residual contamination in soil beneath the site during the construction phase could result in an adverse impact on the receiving hydrogeological and hydrological environment. Piling during the construction phase of the Proposed Development may also potentially create pathways for sources of contamination in shallow soils to enter underlying groundwater. The potential for the inadvertent import of contaminated materials during the construction phase could also result in an impact in the absence of the quality control measures.

Taking account of the mitigation measures any environmental harm would be avoided and it is considered that there would be a 'neutral', 'imperceptible' and 'short-term' impact on the receiving environment.

## 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. These included control and management of earthworks, control and management of soils, subsoils and stockpiles, management and control procedures for the exportation of surplus soils and subsoils, management and control procedures for the importation of aggregates and materials, control and handling of cementitious materials, control and handling of fuel and hazardous materials, and accidental release of contaminants. 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 6-3.

The excavation and removal of soil and subsoil impacted with lead, mineral oil, TPHs, benzene, toluene, ethylbenzene, m&p-xylene, o-xylene and methyl tert-butyl ether, other speciated PAHs and PCBs will have a positive impact on the quality of soils underlying the site.

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 ‘imperceptible’ to the receiving environment (land, soil and geology) and considered non-significant in the context of the EIA Directive.

*Table 6-3 Residual Effects*

| Activity | Attribute | Predicted Effect | Quality | Significance (Significance in the Context of the EIA Directive) | Duration | Type | Mitigation | Residual Effect (Significance in the Context of the EIA Directive) |
|---|---|---|---|---|---|---|---|---|
| **Construction Phase** | | | | | | | | |
| Construction of the Proposed Development | Land Take and Land Use | The Proposed Development will require a land take of 1.621ha and will see a regenerative land use change from brownfield land to residential and commercial land use. | Neutral | Slight (Non-significant) | Permanent | Direct | Unavoidable and no mitigation. The Proposed Development is in line with the zoning objectives as set out in the Galway City Development Plan 2023 – 2029. | Non-Significant (Non-significant) |
| Excavation and Removal of in-situ Soil and Subsoil | Soils and Subsoils | The excavation of approximately 11,594.268m³ of Made Ground soils impacted with anthropogenic contamination and permanent removal offsite is a design requirement of the Proposed Development. | Positive | Moderate to Significant (Significant) | Permanent | Direct | As part of incorporated design measures for the Proposed Development in-situ soil validation samples will be collected to ensure that residual contamination in soil has been removed offsite. The removal of the residual soil source will be undertaken under supervision of the Project Environmental Consultant. | Positive (Non-significant) |
| Reuse of Excavated Soil | Soils and Subsoils | Approximately 11,594.268m³ of contaminated soils and made ground will be excavated during bulk | Neutral | Imperceptible (Non-significant) | Permanent | Direct | The re-use of any soil onsite will be subject to control procedures which will include soil quality | Imperceptible (Non-significant) |

| Activity | Attribute | Predicted Effect | Quality | Significance (Significance in the Context of the EIA Directive) | Duration | Type | Mitigation | Residual Effect (Significance in the Context of the EIA Directive) |
|---|---|---|---|---|---|---|---|---|
| | | excavations as part of the remedial excavations for the Proposed Development and removed offsite. However, where possible, excavated soil and subsoil materials, approximately 4,469.252m$^3$ to achieve formation levels, will be reused for engineering fill and landscaping subject to suitability for reuse. | | | | | testing to ensure suitability for use onsite and in accordance with engineering and environmental specification for the Proposed Development | |
| Use of Cementitious Materials | Soils and Subsoils | Potential release of cementitious material during construction of subsurface structures (such as foundations) to the land, soil, and geological environment. | Negative | Moderate (Significant) | Long-Term | Direct | The cementitious grout and other concrete works during the construction phase, will avoid any contamination of ground through the use of appropriate design and methods implemented by the appointed contractor and in accordance with the CEMP (DNV, 2025) and relevant industry standards. | Imperceptible (Non-significant) |
| Accidental Release of Deleterious Materials (e.g., | Soils, Subsoils and Bedrock | Potential (albeit low) for uncontrolled release of deleterious materials including fuels and other | Negative | Moderate to Significant (Significant) | Long Term | Direct / Worst Case | Refueling of plant and storage of any deleterious materials including fuels will be | Imperceptible (Non-significant) |

| Activity | Attribute | Predicted Effect | Quality | Significance (Significance in the Context of the EIA Directive) | Duration | Type | Mitigation | Residual Effect (Significance in the Context of the EIA Directive) |
|---|---|---|---|---|---|---|---|---|
| Fuels or Other Hazardous Materials Being Used Onsite) | | materials being used on-site, through the failure of secondary and tertiary containment or a materials handling accident, to the land, soil, and geological environment. | | | | | undertaken in accordance with the requirements and procedures outlined in the CEMP (DNV, 2025). | |
| 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 | Slight (Non-significant) | Long-term | Direct | The segregation and stockpiling of soil and stone at the site pending reuse (although unlikely) or removal offsite will be carefully managed and maintained in order to minimise potential effect on soil quality. | Imperceptible (Non-significant) |
| Import of Aggregates Onsite | Land, Soil and Geology | The Proposed Development will require the importation of aggregates (approximately 5,884.268$m^3$ of soil and subsoil materials) 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. | Neutral | Imperceptible (Non-significant) | Permanent | Indirect | Only certified materials from authorised sources will be used. | Imperceptible (Non-significant) |
| **Operational Phase** | | | | | | | | |

| Activity | Attribute | Predicted Effect | Quality | Significance (Significance in the Context of the EIA Directive) | Duration | Type | Mitigation | Residual Effect (Significance in the Context of the EIA Directive) |
|---|---|---|---|---|---|---|---|---|
| Residual Contamination in Retained Made Ground Soils | Future Occupants | Elevated concentrations of lead, benzo(a)pyrene were present within the Made Ground across the site, which pose a low to medium risk to human health (MKO, 2022), based on residential (without gardens) end use scenario. | Neutral | Imperceptible (Non-significant) | Permanent | Direct | The footprint of the proposed buildings will prevent any future contact or exposure of any remaining contaminated soil. In addition, any areas which will be developed as public open space (i.e., the landscaped courtyards and open spaces between the buildings) will be completed as necessary with imported clean soil to prevent site users from interacting with contaminated soil. | Imperceptible (Non-significant) |

## 6.8 Monitoring

### 6.8.1 Construction Phase

During the construction phase of the Proposed Development, the following monitoring measures will be implemented:

- 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 CEMP (DNV, 2025) and that the requirements of the Conditions of Planning, the NIS and associated documentation are being adhered to during construction.
- Routine monitoring and inspections during refuelling, concrete works 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 soil quality, water quality and human health (i.e., workers onsite) are fully implemented and effective.
- Inspections of stockpiles with regular review of weather conditions to ensure appropriate wetting occurs during dry periods and appropriate covering during windy periods.
- The removal of the residual soil source will be validated by the Project Environmental Consultant in accordance with relevant guidelines including EPA ‘Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites’ (EPA, 2013a) and guidance and standards current at the time of construction works.
- The appointed contractor will monitor excavations to ensure consistency with the descriptions and classifications according to waste acceptance criteria testing carried out as part of the site investigations in 2024 (GII, 2024) which will be undertaken in advance of construction works commencing.
- Soil and subsoil materials to be reused within the Proposed Development (i.e., for engineering fill and landscaping) will be subject to an assessment of the suitability for use, in accordance with engineering and environmental specification for the Proposed Development.
- In the event that previously unidentified contaminated soils are encountered during the excavation soil samples will be submitted for chemical analysis to confirm that residual sources of contamination do not remain on site. The soil shall be excavated and removed from the site for treatment or disposal within a licensed waste facility. Additional validation samples shall be taken to ensure that a ‘clean edge’ is reached in the area of excavation. A Validation Report will be prepared detailing extent of excavation to included confirmatory sampling demonstrating effective removal of impacted materials. Removal of materials offsite will also be supported by the provision of a compliant waste classification report in line with duty of care obligations.
- A dust deposition monitoring programme will be implemented during the construction phase in order to verify the continued compliance with relevant standards and limits. Where required, the appointed contractor will undertake dust monitoring at a range of nearest sensitive receptors during the construction phase of the Proposed Development.

- Materials management and waste audits will be carried out at regular intervals to monitor the following:
    - Management of soils onsite and for removal offsite.
    - Record keeping.
    - Traceability of all materials, surplus soil and other waste removed from the site.
    - Ensure records are maintained of material acceptance at the end destination.

### 6.8.2 Operational Phase

Landscaping within public / communal open space areas shall be validated by the Project Environmental Consultant to ensure the design of the capping layer is in accordance with the detailed design ensuring that any potential risks associated with direct contact of soils is removed.

There are no other monitoring requirements specifically in relation to land, soil and geology during the operational phase of the Proposed Development.

## 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.

The soils beneath the site are locally impacted with lead and benzo(a)pyrene in excess of the GACs for residential (without gardens) end use scenario. Detectable concentrations of mineral oil, TPHs, benzene, toluene, ethylbenzene, m&p-xylene, o-xylene and methyl tert-butyl ether, other speciated PAHs and PCBs have also been reported in Made Ground soils beneath the site. Without suitable remedial measures the contamination in the soils under the Proposed Development poses a risk to site workers and future occupants of the site.

Appropriate industry standard and health and safety legislative requirements will be implemented during the construction phase of the Proposed Development that will be protective of site workers. All works will be undertaken by the appointed contractor in accordance with industry best practice to manage risk form contaminated soils. These will be designed by the appointed contractor dependent on his construction practices and may to include the use of gloves, dust masks and potentially disposable overalls. These and other appropriate measures will minimise the exposure of the site workers.

The design of the Proposed Development will ensure that there is no risk to future occupants. The footprint of the proposed buildings will prevent any future contact or exposure of any remaining contaminated soil. In addition, any areas which will be developed as public open or communal amenity space (i.e., the landscaped courtyards and open spaces between the buildings) will be completed as necessary with imported clean soil to prevent site users from interacting with contaminated soil. Accordingly, it is considered that there will be no impact on future occupants of the site.

### 6.9.2 Biodiversity

An assessment of the potential effects of the Proposed Development on the Biodiversity of the site, with emphasis on habitats, flora and fauna which may be affected as a result of the excavation and importation of materials to the site are included 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 EIAR.

Groundwater locally impacted with petroleum hydrocarbons is present in the groundwater in close proximity to the site boundary. The removal of residual sources of contamination in soils will likely improve the quality of groundwater beneath the site.

The mobilisation of residual contamination in soil beneath the site during the construction phase could result in an adverse impact on the receiving hydrogeological and hydrological environment. Piling during the construction phase of the Proposed Development may also potentially create pathways for sources of contamination in shallow soils, groundwater and leachates to enter underlying groundwater.

Procedures for the protection of the receiving water environment are addressed in Chapter 7, Section 7.6, of this EIAR.

### 6.9.4 Air Quality

The excavation of soils across the site and the temporary stockpiling of soils pending reuse or removal offsite has the potential to generate nuisance effects (i.e., dust) during the construction phase of the Proposed Development. An assessment of the potential effect of the Proposed Development on air quality is included in Chapter 8, Section 8.5 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 undeveloped lands to residential use. An assessment of the potential effect of the Proposed Development on the receiving landscape is included in Chapter 11, Section 11.6 of this EIAR.

### 6.9.6 Material Assets: Traffic, Transport, Utilities, Infrastructure and Waste

Where possible, it is intended to retain and re-use excavated soil and subsoil on the site for engineering fill and landscaping. However, it is anticipated that the majority of excavated soil and subsoil, including contaminated soil, will require removal offsite in accordance with all statutory legislation. Additionally, there is a requirement to import aggregates during the construction phase of the Proposed Development.

An assessment of the potential effect of the Proposed Development on the material assets (traffic and transport) and material assets (waste) are included in Chapter 12, Section 12.5 and Chapter 13, Section 13.5 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, taking into account the avoidance, remedial, and mitigation measures outlined in Section 6.6, 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 (land, soil, and geology). These effects are deemed non-significant within the context of the EIA Directive. Furthermore, no soil-related constraints have been identified, following the control procedures, including soil quality testing and the incorporated design measures for the Proposed Development, that would be expected to hinder or prevent the Proposed Development from proceeding as planned.

## 6.12 References

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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 Proposed Development site.
- 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, Soils and Geology and Chapter 13 Material Assets: Waste and Utilities 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

This chapter of the EIAR was prepared by Nuria Manzanas BSc, MSc, a Principal Consultant of DNV. Nuria is a Chartered Geologist (PGeo) with the Institute of Geologists of Ireland (IGI) with over 11 years' experience in contaminated land and hydrogeological assessments.

This chapter of the EIAR was also prepared by Gareth Carroll BA BEng MIEnvSc CEnv, a Principal Consultant of DNV. Gareth is a Chartered Environmentalist (CEnv) with the Institute of Environmental Sciences (IES) with over 12 years' experience of preparing environmental and hydrogeological assessments for a range of project types and geological and hydrogeological site settings.

This chapter of the EIAR was approved by Patrick Higgins BSc, MSc, MIEnvSc, CEnv, with over 20 years' experience of preparing environmental and hydrogeological assessments for a range of project types and geological and hydrogeological site settings and who is Technical Director with DNV, 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 had regard to 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.
- Local Government, October 2021. No. 1.1977. Local Government (Water Pollution (Amendment) Act.
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- S.I. No. 722/2003 – European Communities (Water Policy) with amendment S.I. No. 413/2005.
- 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 including amendment S.I. No. 495/2015.
- S.I. No. 272/2009 - European Communities Environmental Objectives (Surface Waters) Regulations 2009 including amendments S.I. No. 327/2012, S.I. No. 386/2015 and S.I. No. 77/2019.
- S.I. No. 9 of 2010 - European Communities Environmental Objectives (Groundwater) Regulations 2010 including amendments S.I. No. 149 of 2012 and S.I. No. 366 of 201.
- 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).
- Galway City Development Plan 2023-2029 (GCC, 2023).

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 include:

- Construction Industry Research and Information Association, 2001. Control of Water Pollution from Construction Sites (CIRIA – C532).
- Construction Industry Research and Information Association, 2015. Environmental Good Practice on Site Guide (CIRIA – C741).
- Construction Industry Research and Information Association, 2016. Groundwater Control: Design and Practice (CIRIA – C750).

- Department of the Environment, Heritage and Local Government, Environmental Protection Agency and Geological Survey of Ireland, 1999. Groundwater Protection Schemes (DEHLG/EPA/GSI, 1999).
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- Department of Housing, Planning and Local Government, August 2018. Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Effect Assessment (DHPLG, 2018).
- Environmental Protection Agency, 2014. Guidance on the Authorisation of Direct Discharges to Groundwater.
- Environmental Protection Agency, 2013. Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites.
- Environmental Protection Agency, 2013. Storage and Transfer of Materials for Scheduled Activities.
- Environmental Protection Agency, May 2022. Guidelines on the information to be contained in Environmental Effect Assessment Reports (EPA, 2022).

### 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 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 hydrological and hydrogeological 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 Hydrology and Hydrogeology 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 site 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 2.0km from the site.

The study area for the Hydrology and Hydrogeology Chapter of the EIAR is defined to ensure a comprehensive assessment of baseline conditions. This area extends beyond the immediate boundaries of the Proposed Development site to include a broader region. The 'site' refers specifically to the land where the Proposed Development will take place. The 'study area' encompasses a wider region, extending at least 2.0 km 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 waterbodies and protected sites that might undergo changes in water 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 Proposed Development site, the broader study area ensures that any indirect or secondary effects on hydrology and hydrogeology 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 site of the Proposed Development and surrounding area including published information and details pertaining to the Proposed Development provided by the applicant and design team.

Site walkover inspections and surveys were conducted by DNV on the 2nd of May 2024 and the 4th of June 2025. These inspections aimed to identify and assess the site condition, the site setting, and the receiving environment, including local hydrogeological and hydrological features and potential receptors.

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, 2025).
- Geological Survey Ireland (GSI) Datasets Public Viewer and Groundwater webmapping (GSI, 2025).
- National Parks and Wildlife Services (NPWS) webmapping (NPWS, 2025).
- Ordnance Survey Ireland (OSI) webmapping (OSI, 2025).
- Water Framework Directive Ireland (WFD) webmapping (WFD, 2025).
- Teagasc webmapping (Teagasc, 2025).
- Office of Public Works (OPW) database on historic flooding and the Catchment Flood Risk Assessment and Management (CFRAM) maps (OPW, 2025).
- Information provided by the Applicant pertaining to the design proposals for the Proposed Development.

The findings of previous site investigations undertaken at the site were also reviewed by DNV as part of the Element 1 stage of the assessment as summarised below. Copies of the relevant reports are presented in Volume 3: Appendix 6-1 of this EIAR. The Water Framework Directive Assessment (WFD) Report (DNV, 2025b) is included in the EIAR Volume 3: Appendix 7.1.

Initial site investigations were carried out in 2009 by RSK Group Plc across a wider area encompassing the Proposed Development site. Subsequent investigations were undertaken between August and September 2019 by MKO (2019), who were commissioned by the Galway Harbour Company (GHC), covering an area of approximately 11 hectares (ha). This phase included the excavation of trial pits and window sampler boreholes, along with the collection and analysis of soil and groundwater samples, and gas monitoring at the investigation locations.

Following the findings and recommendations of the earlier investigations, further site investigations were conducted between August and September 2022 by MKO (2022) on behalf of GHC, for due diligence purposes and to support future land use planning and design

processes, which focused on an area of approximately 1.6 ha corresponding to the actual footprint of the Proposed Development and slightly beyond the Proposed Development area. This investigation involved the excavation of fifteen (15 No.) window sampler boreholes, followed by rotary core boreholes, and the collection of soil and groundwater samples.

The most recent site investigation was undertaken between July and September 2024 by Ground Investigations Ireland (GII) (2024) on the instructions of TOBIN Consulting Engineers (TOBIN), on behalf of the Land Development Agency (LDA). This phase comprised the excavation of fifteen (15 No.) trial pits and nine (9 No.) cable percussion boreholes, followed by rotary core drilling. Three (3 No.) of the rotary core boreholes were installed as groundwater monitoring wells. Soil samples were collected, and groundwater level monitoring was initiated at the relevant locations.

**Element 2:** Involves direct and indirect site investigation and studies 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 reviewed in Element 1, it was determined based on professional judgement that in accordance with industry best practice guidance and standards there was adequate site-specific scientific data available for the assessment. The previous studies reviewed as part of Element 1 provided sufficient information including comprehensive site investigations and site-specific information on the hydrological and hydrogeological conditions at the site to inform the effect assessment of the Proposed Development site on the receiving waterbodies.

**Element 3:** Evaluation of Mitigation Measures, Residual Impacts and Final Impact Assessment were based on the outcome of the information gathered in Element 1 of the assessment. Mitigation measures to address all identified adverse impacts that were identified in Element 1 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 Chapter 7 Hydrology and Hydrogeology of the EIAR 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.<br>Groundwater supports river, wetland, or surface water body. ecosystem protected by national legislation – e.g., NHA status.<br>Regionally important potable water source supplying >2500 homes<br>Inner source protection area for regionally important water source.<br>Quality Class A (Biotic Index Q4, Q5). |

| Importance | Criteria | Typical Example |
|---|---|---|
| | | 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.<br>Groundwater provides large proportion of baseflow to local rivers.<br>Locally important potable water source supplying >1000 homes.<br>Outer source protection area for regionally important water source.<br>Inner source protection area for locally important water source.<br>Quality Class B (Biotic Index Q3-4).<br>Flood plain protecting between 5 and 50 residential or commercial properties from flooding.<br>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<br>Potable water source supplying >50 homes.<br>Outer source protection area for locally important water source.<br>Quality Class C (Biotic Index Q3, Q2- 3).<br>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.<br>Potable water source supplying <50 homes.<br>Locally important amenity site for small range of leisure activities.<br>Local potable water source supplying <50 homes.<br>Quality Class D (Biotic Index Q2, Q1).<br>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 of the EIAR are described in Table 7-2.

*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 weather 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 | 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 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.

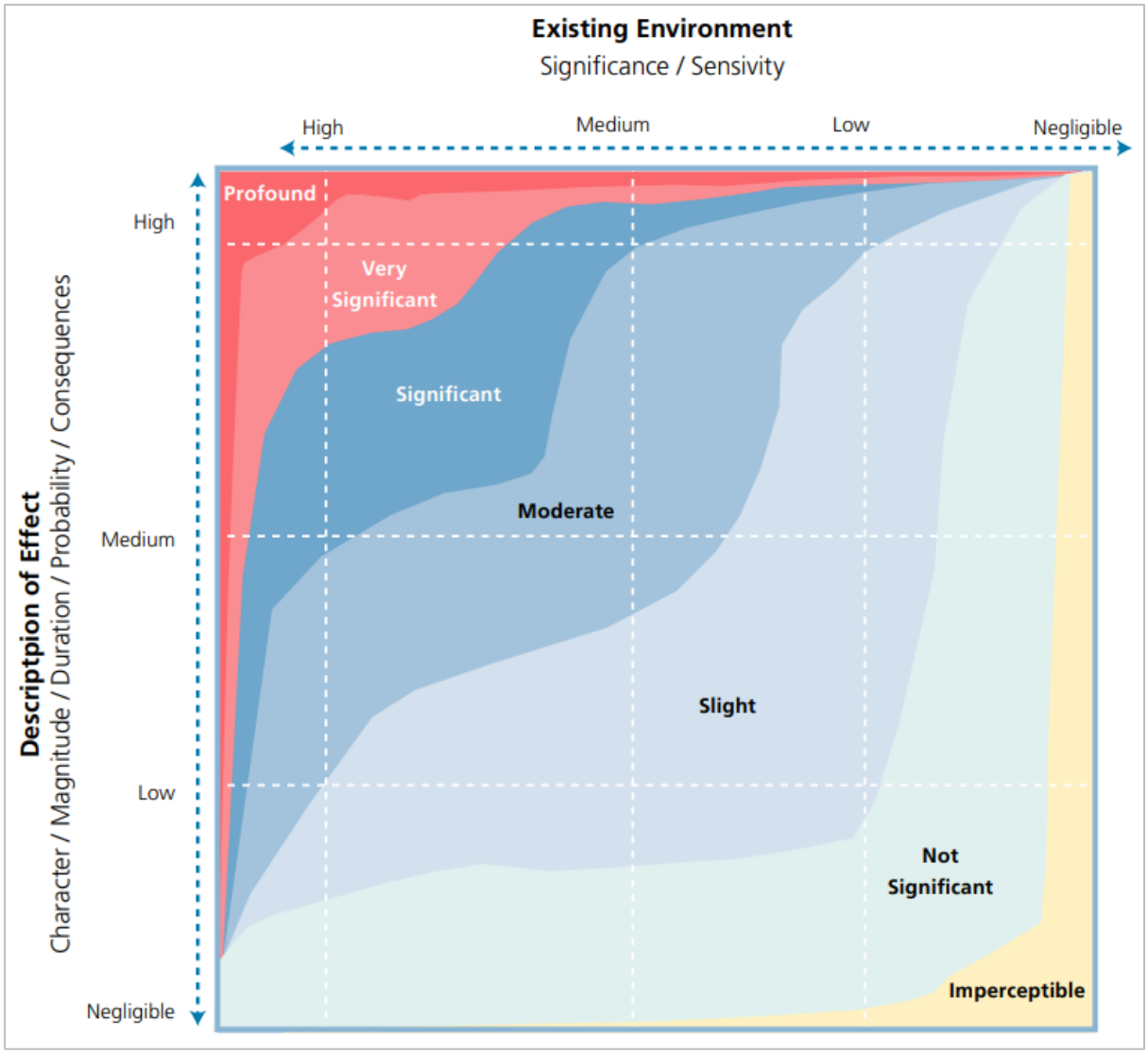



*Figure 7-1 Determining Significance*

## 7.3 The Existing and Receiving Environment

### 7.3.1 Site Location

The site location and a full description of the existing and historical land use at the site are provided in Chapter 2 (Description of the Proposed Development) of this EIAR.

The site location is presented in Figure 7-2 and the current site layout is presented in Figure 7-3.




*Figure 7-2 Site Location*




*Figure 7-3 Current Site Layout*

### 7.3.2 Topography

Due to the site primarily being composed of reclaimed land from Galway Bay the topography at the site is generally level and just about sea level. The site gently slopes from northwest to southeast.

The topography surrounding the site of the Proposed Development is generally sloping toward the southeast and east in the general direction of Lough Atalia.

### 7.3.3 Soil, Subsoil and Geology

The soils and geology at the site are described and assessed in detail in Chapter 6 (Land and Soils) of this EIAR and are summarised as follows:

- The soils in the northwestern boundary of the site are classified as made ground (IFS Soil Code: Made), (Teagasc, 2025). The soils within the majority of the site are not mapped on the Teagasc mapping tool. However, previous site investigations have shown that there is a layer of Made Ground within and outside of the Proposed Development site boundary.
- The subsoil or quaternary deposits beneath a small portion within the northwestern boundary of the site are mapped by the GSI as Urban (Urban) (GSI, 2025). The subsoils within the majority of the site are not mapped on the GSI mapping tool. However, previous site investigations have shown that there is a layer of Possible Estuarine Sediments (PED) within and outside of the Proposed Development site boundary which generally comprises very soft to very stiff greyish brown slightly sandy gravelly clay, sandy organic clay or silty clay.

As documented in the MKO Phase 2 Report (MKO, 2022; refer to Volume 3: Appendix 6-1 of this EIAR), the ground conditions across the site following the site investigations comprised the following:

- Made Ground: Ranged in thickness between 2.65m to 8.1m, generally comprised clayey gravel, sandy gravelly clay, sandy clayey gravel, silty sandy gravelly clay, gravelly clayey sand, gravelly clay or gravel.
- Possible Made Ground: Comprised grey, pink, and green gravel, cobbles and boulders.
- Possible Estuarine Sediments (PED): Typically ranged in thickness between 1.2m to 3.1m and generally comprised very soft to very stiff greyish brown slightly sandy gravelly clay, sandy organic clay or silty clay.

The bedrock beneath the majority of the site is not mapped by the GSI (GSI, 2025) as the area comprises reclaimed land from Lough Atalia. However, the sites northwest boundary is mapped as part of the Metagabbro and Orthogenesis Suite (code: LTMGOG) which comprises Undifferentiated Quartz-Diorite Gneiss (Qd), Quartz Diorite Gneiss and Granitic Gneiss (Qg), and Metagabbro and Related Lithologies (Mg).

As documented in the MKO Phase 2 Report (MKO, 2022; refer to Volume 3: Appendix 6-1 of this EIAR), two (2 No.) type of bedrock were encountered across the site following the site investigations comprised the following:

- The Metagabbro and Orthogenesis Suite encountered at depths ranging between 6.7 meters below ground level (mbgl) and 9.45mbgl.

- The Orthogneiss Suite encountered at depths ranging between 7.1mbgl and 9.1mbgl.

Refer to Chapter 6 of this EIAR for more information on soils, subsoils and bedrock encountered at the site.

### 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, 2025) and is presented in Table 7-3.

*Table 7-3 Long Term Mean Monthly Rainfall Data (mm)*

| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sept | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 119.1 | 45.6 | 191.7 | 86.9 | 49.9 | 77.5 | 201.2 | 123.7 | 124 | 194.4 | 122.4 | 220.3 | 1556.7 |
| Note: 1km x 1km Irish Grid Coordinated selected for the Site =X (Easting): 129000, Y (Northing): 225000 | | | | | | | | | | | | |

The closest the synoptic meteorological station to the site is at Athenry which is located approximately 17km east of the Proposed Development site. The average potential evapotranspiration (PE) from the Athenry station for the period 2022 to 2024 (Met Éireann, 2025) is presented in Table 7-4.

*Table 7-4 Average Potential Evapotranspiration (mm)*

| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sept | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11.0 | 18.2 | 35.8 | 54.84 | 78.22 | 87.09 | 79.98 | 69.98 | 45.96 | 24.99 | 11.92 | 9.27 | 527.97 |

### 7.3.5 Hydrogeology

#### *7.3.5.1 Site Hydrogeology and Groundwater Levels*

Information on the site hydrogeology, specific water quality beneath the site and groundwater levels is presented in Section 7.3.6.

#### *7.3.5.2 Groundwater Body and Flow Regimes*

The EPA (EPA, 2025) maps the groundwater body (GWB) beneath the site as the Clarinbridge GWB (EU Code: IE_WE_G_0008). The Clarinbridge GWB covers some 375km$^2$ and occupies an area across Co. Galway, specifically areas between Galway, Athenry, Kinvara and Loughrea, with Clarinbridge at a central location along the coastline (GSI, 2025).

Diffuse recharge occurs via rainfall percolating through the permeable subsoil and rock outcrops across the Clarinbridge GWB. Point recharge occurs via swallow holes distributed across the Clarinbridge GWB and via discrete sinks located within the main rivers. The large springs located at the head of the main estuaries are the main groundwater discharge points. There are also numerous springs located inland, many associated with turloughs which can also act as sinks (estavelles) for 10-50 days a year. Springs located inland tend to cease to flow during low flow conditions (GSI, 2025).

The karstification within the Clarinbridge GWB is widespread with approximately 100 karst features identified representing only a small amount of the features present within this GWB. Groundwater flow directions within the aquifer are mainly towards the west, with groundwater discharging to littoral and intertidal springs at the head of the main estuaries (GSI, 2025).

The majority of the groundwater flows within the epikarstic layer, which is the uppermost part of the karst system essential for groundwater recharge, located just below the surface (i.e., a couple of meters in thickness). Groundwater also flows in a zone of interconnected enlarged fissures and conduits (i.e., openings) that extend approximately 35 m below this. In pure bedded limestones these openings (i.e., fractures, fissures, joints, etc.) are enlarged by karstification which significantly enhances the permeability of the rock. Deeper inflows can occur in areas associated with faults or dolomitisation. However, groundwater flow through karst areas is extremely complex and difficult to predict. Rapid groundwater flow velocities occurring within the system, indicate that a large proportion of groundwater flow occurs in enlarged conduit systems. Regionally, flow path lengths can be up to a several kilometres (GSI, 2025).

#### *7.3.5.3 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 Clarinbridge Formation (Code: CDLUCN) beneath the majority of the site is classified by the GSI (GSI, 2025) as a Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones.

A small portion of the site adjacent to Galway Bay has not been delineated by the EPA as being underlain with a bedrock aquifer, likely due to its nature as reclaimed lands.

There are no gravel aquifers mapped at the site or within a 2km radius of the site (GSI, 2025).

The bedrock aquifer map is presented in Figure 7-4.

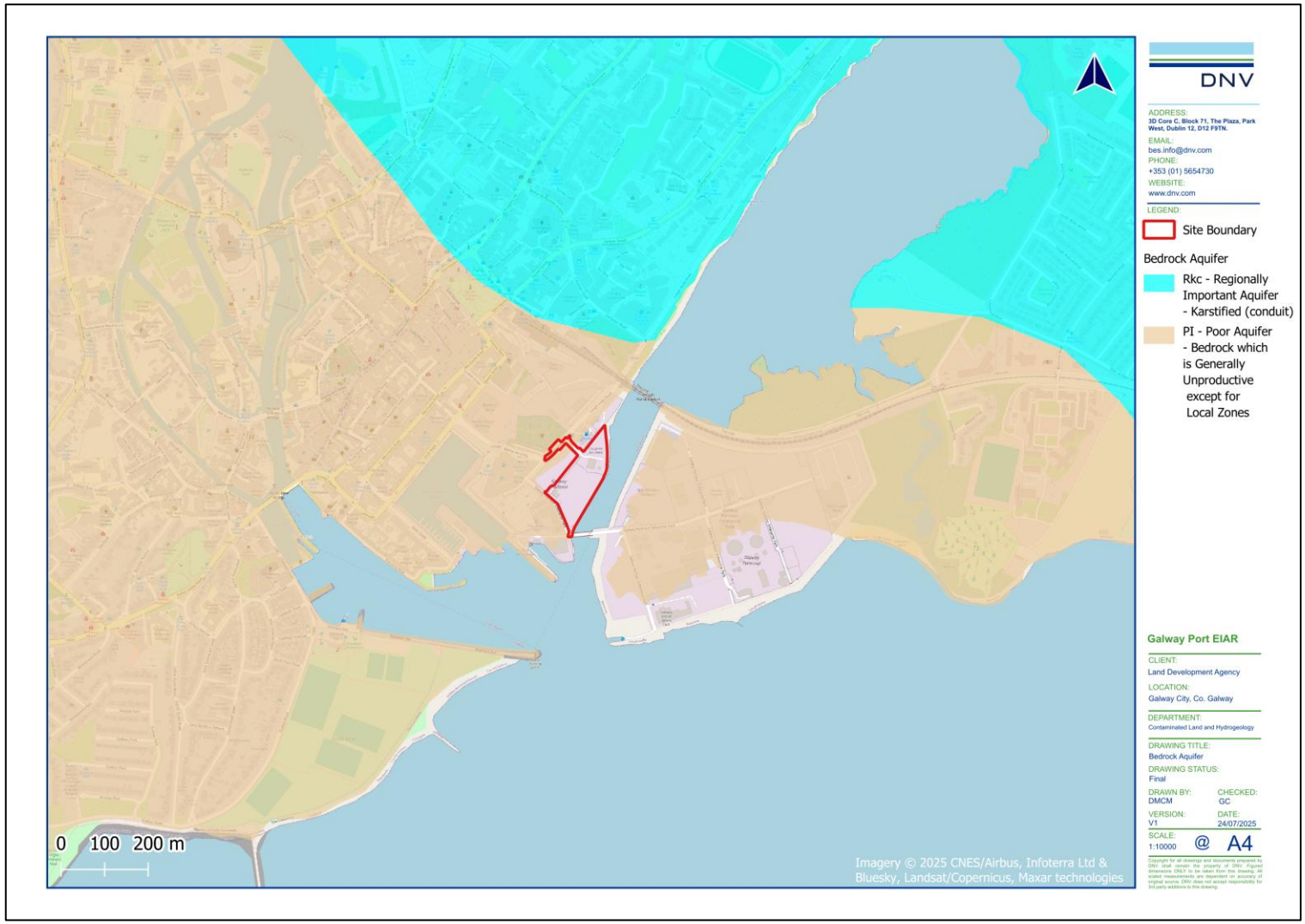



*Figure 7-4. Bedrock Aquifer*

#### *7.3.5.4 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 |
| 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 northeastern portion of the site (GSI, 2025). It is noted that the majority of the site does not have a groundwater vulnerability rating mapped on the GSI mapping tool due to the reclaimed nature of the lands.

The anticipated depth to bedrock based on the moderate groundwater vulnerability rating and moderate permeability subsoils beneath the site is greater than 10mbGL.

Previous site investigations undertaken for the site have recorded a depth to bedrock ranging from 6.70mbgl to 9.45mbgl during the 2022 site investigations (MKO, 2022) and from 5.80mbgl to 9.45mbgl during the 2024 site investigations (GII, 2024). Considering the moderate permeability subsoils encountered this indicates site-specific vulnerability rating of ‘High’.

The groundwater vulnerability map is presented in Figure 7-5.

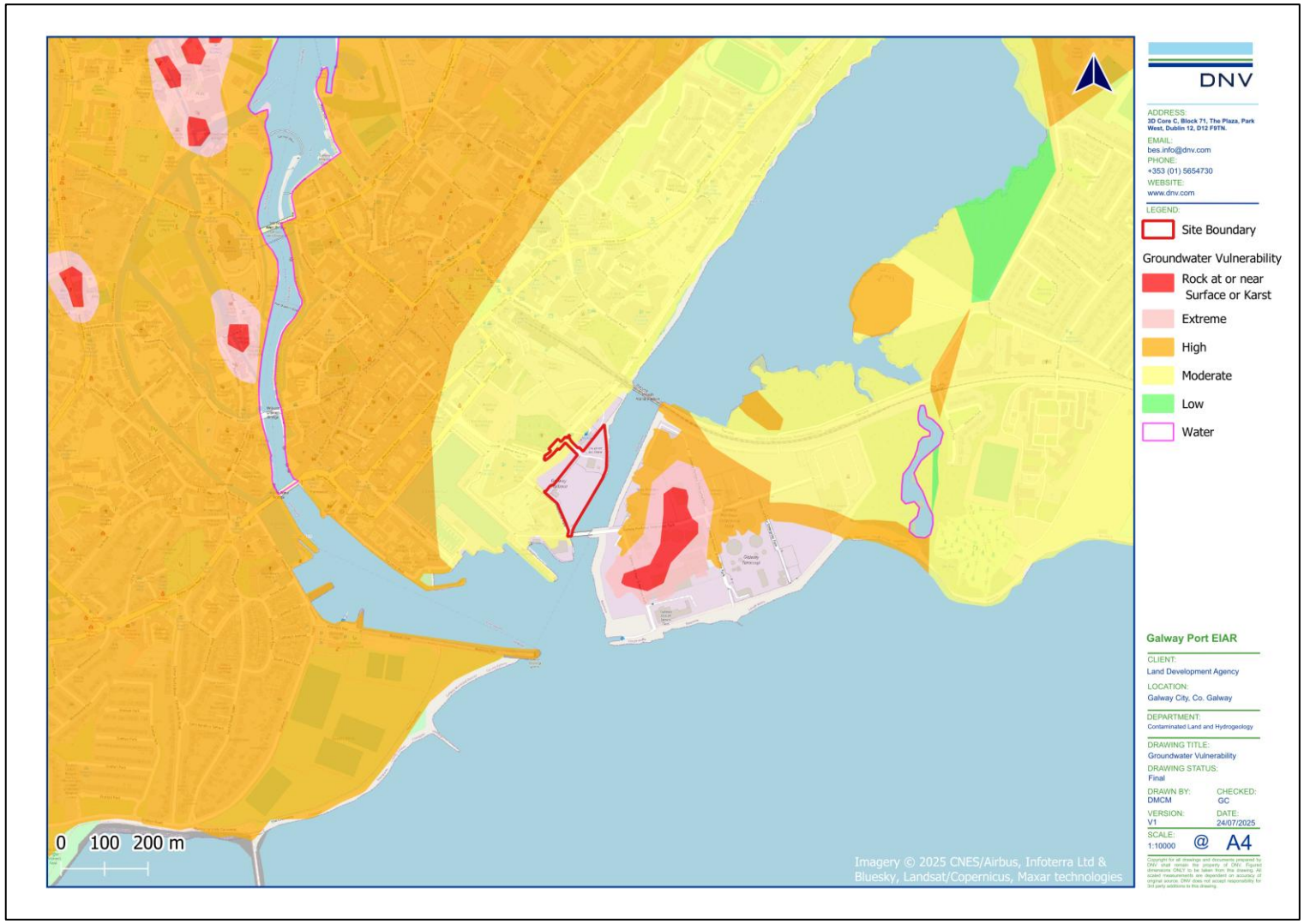



*Figure 7-5 Vulnerability Map*

### 7.3.6 Previous Site Investigation Results

The findings of previous site investigations undertaken at the site are summarised below. Copies of the relevant reports are presented in Volume 3: Appendix 6-1 of this EIAR.

#### *7.3.6.1 Site Investigations and Information – 2009 (RSK)*

A Quantitative Risk Assessment (QRA) was undertaken by RSK Group Plc, based on information included in an Environmental Site Assessment (ESA) also produced by RSK in 2009. The ESA focused on a section of the proposed site, specifically the former tank area where ground investigation had previously been conducted. This information was summarised as part of the MKO Planning and Environmental Consultants (MKO) report in 2019 (MKO, 2019). The findings of the assessment in regard to groundwater are summarised as follows:

- Human Health Generic Quantitative Risk Assessment (GQRA)
    - Groundwater: No concentrations of MTBE, BTEX or aliphatic / aromatic hydrocarbon fractions exceed the generic groundwater screening values (GAC) for human health. Therefore, a potential exposure pathway to onsite workers, offsite workers and any offsite residents based on the CSM was considered incomplete, indicating that there is no viable linkage between the source and these receptors.
- Water Environment GQRA
    - Groundwater analytical results from all monitoring locations onsite were below the laboratory method detection limit (LMDL), and therefore at levels below the Interim Guideline Values (IGV). Therefore, a linkage to the water environment was considered incomplete. It should be noted, however, that IGVs are no longer in use as applicable assessment criteria for groundwater.
- Risks to Utilities
    - The Guideline Assessment Criteria (GAC) for permeation of plastic pipes were exceeded in five of the soil samples tested from the top 1 meter of soil.
    - The report concluded that a potential risk exists to the water supply and further investigation is required to determine the level of risk.

- Summary of Pollutant Linkages
    - A linkage to onsite workers, offsite workers and any offsite residents was considered incomplete.
    - A potentially complete pollutant linkage has been identified at the site with respect to the permeation of plastic services by hydrocarbons sorbed to shallow soil.
    - A potential risk was also noted to construction workers associated with direct contact with hydrocarbon impacted soil. Refer to the Soil Chapter (Chapter 6) for information of the soil assessment and findings during this site investigation.

#### *7.3.6.2 Site Investigations and Information – 2019 (MKO)*

In 2019, the Galway Harbour Company (GHC) commissioned MKO to undertake a desk study and intrusive investigation at the Galway Inner Harbour site (Phase 1 – Galway Inner Harbour, Galway) for due diligence purposes and to support the planning and design processes (MKO, 2019).

At the time of the site walkovers (undertaken on the 14th and 21st August 2019) and associated site investigations, the former study site, comprised various land uses. For ease of reference the former study site was divided into four areas (i.e., Areas 1 to 4) covering an area of approximately 11ha. The areas are presented in Figure 7-6 and summarised as follows:

- Area 1 - comprised the Galway Harbour Office and associated car parking.
- Area 2 - comprised the Contract Car Park which was formally the Tynagh Mines site historically used to store iron ore from the Tynagh lead and zinc mine in East Galway.
- Area 3 – comprised the former coal yard and oil depot site. There was evidence of bases presumed to be the former storage tank supports, although no storage tanks were evident at the time of the walkover. Information provided by a representative from the Galway Harbour Company confirmed that the eleven oil storage tanks were decommissioned and disposed offsite in 2017.
- Area 4 - comprised the Texaco Petrol Station, shop and car wash, Mor Oil and City Direct Bus office and parking area located in the northern section of the former site.

Note that Area 1 and Area 2 are not part of the Proposed Development site boundary and did not form part of the site investigations undertaken during 2022 (MKO, 2022) and 2024 (GII, 2024). Site investigations in 2022 and 2024 were undertaken within Area 3 and Area 4 (which fall within the boundary of the site and Proposed Development).

Refer to Figure 7-6 for the separation of the four (4 No.) areas where 2019 site investigations were undertaken and the Proposed Development site boundary.

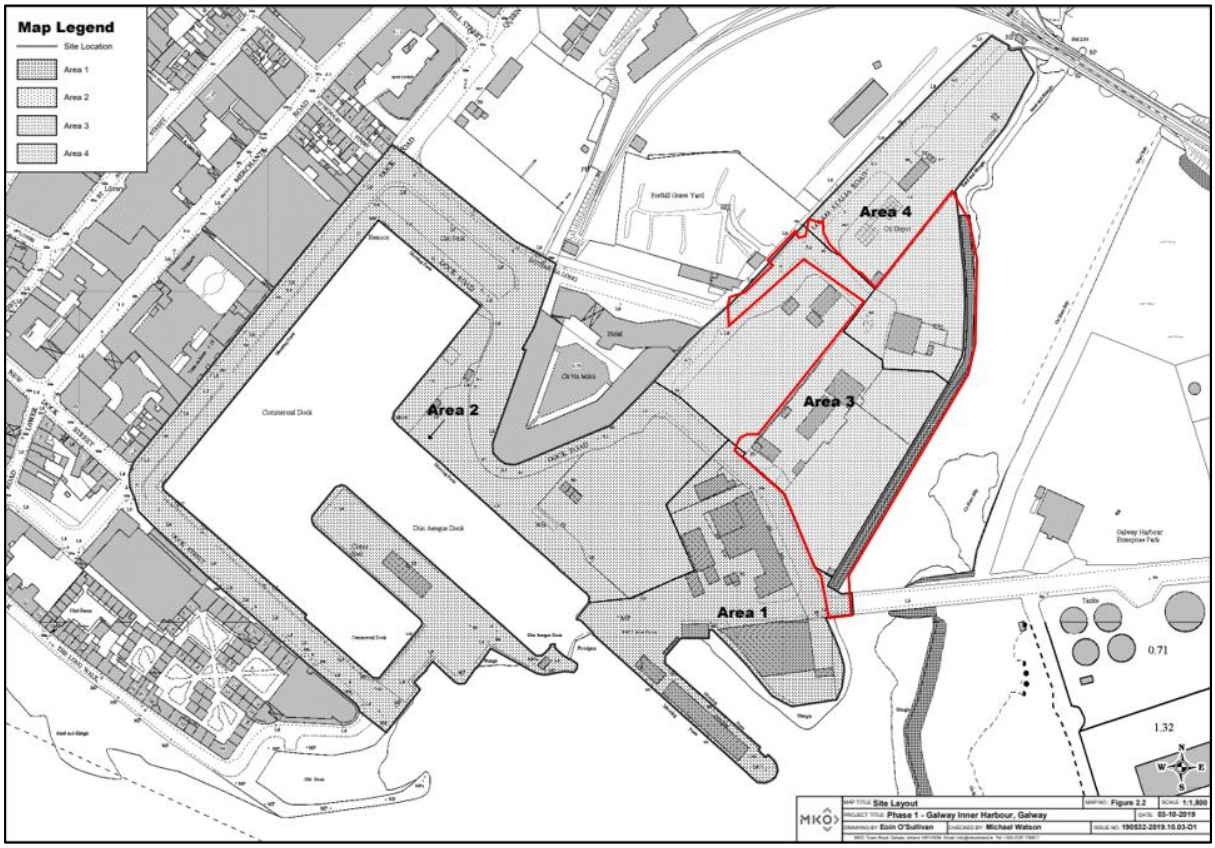



*Figure 7-6 Site Layout – Extracted from MKO Phase 1 Report (MKO, 2019)*

The scope of the groundwater investigations and the associated results at the former site, as documented during the site investigations by MKO (2019), which were conducted both within and beyond the Proposed Development site boundary (covering Areas 1 to 4; refer to Figure 7-7), are presented below.

Groundwater Investigation

Gas and groundwater monitoring standpipes were installed in WS-04, WS-09, WS-10, WS-12, WS-14, WS-16, WS-18 and WS-23. Of these, WS-16 and WS-23 are located within the boundary of the Proposed Development site.

Groundwater levels were measured by GII on three (3 No.) occasions (3rd September 2019, 19th September 2019 and 4th October 2019).

A summary of the groundwater levels is presented in Table 7-6 Groundwater levels were recorded as dry at locations WS-09, WS-10, WS-12, WS-14, WS-16, and WS-23 during all monitoring events. Additionally, groundwater levels were recorded at previously installed locations WS-28 and WS-29 by RSK; however, the exact locations of these wells and their corresponding borehole logs are not available.

*Table 7-6 Groundwater Levels*

| Window Sampling ID | Depth to Groundwater (mbgl) | | |
|---|---|---|---|
| | 03/09/2019 | 19/09/2019 | 04/10/2019 |
| WS-04 | 1.80 | Dry | 2.0 |
| WS-18 | 2.60 | 2.63 | 2.62 |
| WS-28 (RSK) | - | 4.58 | 4.37 |
| WS-29 (RSK) | - | 4.43 | 3.61 |

Note: mbgl – metres below ground level

Based on site-specific data collected during groundwater monitoring events across the wider area (Areas 1 to 4), the direction of groundwater flow within the Made Ground deposits could not be conclusively determined. The available monitoring data is insufficient to establish whether groundwater within the Made Ground constitutes a distinct waterbody or whether it is hydraulically connected to underlying strata.

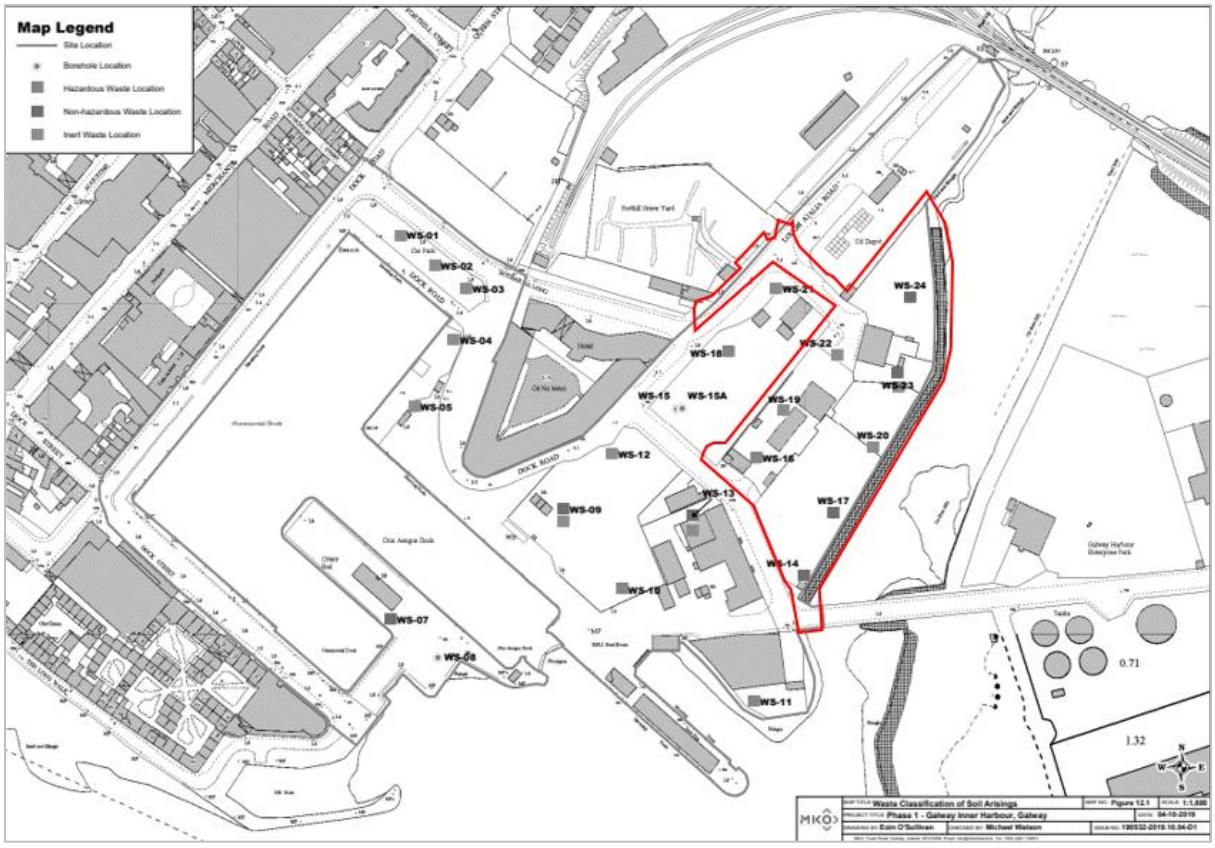



*Figure 7-7 Former Site Investigation Locations (MKO, 2019) encompassing Areas 1 to 4.*

Groundwater samples were collected from two RSK-installed boreholes (WS-28 and WS-29), as groundwater was not sufficiently present in the boreholes installed during the 2019 site investigation. The results were assessed against the Annual Average Environmental Quality Standards (AA-EQS) and the Groundwater Threshold Values (GTV). In the absence of specific AA-EQS or GTV values for certain parameters, the EPA Interim Guideline Values (IGVs) were used for comparison purposes. Most analysed parameters were below the applicable EQS; however, exceedances were noted for total cyanide, benzo(b+k)fluoranthene, and fluoranthene. Additionally, arsenic exceeded the relevant standard in one sample, and sulphate exceeded the standard in both samples. The concentrations of total cyanide and sulphate also exceeded the IGV values.

The Phase 1 Report (MKO, 2019) concludes the following:

*'Whilst it is noted that the limits of detection for cadmium, mercury, phenol, polycyclic aromatic hydrocarbons, Total Petroleum Hydrocarbons and benzene exceed the EQS, GTV and IGV in some instances, the chemical test results of the soil samples have not identified significant elevated concentrations of these contaminants and therefore it is not considered that these contaminants are present at concentrations of concern in the groundwater'* (MKO, 2019).

**Further Site Investigation**

Due to the uncertainty in the results obtained from the RSK groundwater wells (WS-28 and WS-29), the fact that an area to the north of the site (Texaco petrol station and swathe of land) was not accessible and a number of the window sampler boreholes refused at shallow depths within the Made Ground, further site investigations were proposed.

#### *7.3.6.3 Site Investigations and Information – 2022 (MKO)*

Based on the findings and conclusions of the initial MKO Phase 1 Report (MKO, 2019), additional site investigations were undertaken within an approximate site area of 1.6ha in Area 3 and Area 4 (which fall within the boundary of the site and Proposed Development), as documented in the Phase 2 Report (MKO, 2022).

The scope of the groundwater investigations and the groundwater results are summarised below. Refer to Chapter 6 (Soil Chapter) for a summary of the soil investigation.

Groundwater Investigation

Additional site investigations were undertaken between the 28th of August 2022 and the 30th of September 2022 by GII (Ground Investigations Ireland) on behalf of MKO. The site investigations comprised the excavation of fifteen (15 No.) window sampler boreholes (WS201 to WS215) to a maximum depth of 0.9mbgl and fifteen (15 No.) rotary core boreholes (BH01 to BH15 to a maximum depth of 12.30mbgl.

Groundwater monitoring standpipes were installed in all groundwater monitoring wells at the site (BH01 to BH15) installed within and outside the Proposed Development site boundary to monitor water levels.

The site investigation locations are presented in Figure 7-8.




*Figure 7-8 Site Investigation Locations (MKO, 2022) encompassing Areas 3 and 4.*

Groundwater Investigation

One (1 No.) round of groundwater sampling was undertaken between the 11th and 12th of October 2022. Groundwater level monitoring was undertaken in all groundwater monitoring wells on two (2 No.) occasions, between the 11th and 12th of October 2022 and the 10th and 11th of November 2022. The measured groundwater levels at the site are presented in Table 7-7.

*Table 7-7 Measured Groundwater Levels (MKO, 2022)*

| Well ID | Response Zone | Depth to Groundwater (mbgl) | |
|---|---|---|---|
| | | 11-12/10/2022 | 10-11/11/2022 |
| BH01* | Made Ground/Metagabbro | 4.25 | 3.72 |
| BH02* | Made Ground/Metagabbro | 3.92 | 4.19 |
| BH03* | Made Ground/Metagabbro | 4.49 | 4.13 |
| BH04* | Possible Made Ground/Metagabbro | 4.46 | 3.99 |
| BH05* | Made Ground/Metagabbro | 4.38 | 4.44 |
| BH06 | Made Ground/Metagabbro | 3.93 | 4.39 |
| BH07 | Made Ground/PED/Metagabbro | 3.76 | 3.64 |
| BH08 | Made Ground/PED/Metagabbro | 2.9 | 3.99 |
| BH09 | Made Ground/Metagabbro | 3.43 | 3.7 |
| BH10* | Made Ground/PED/Metagabbro | 4.7 | 4.54 |
| BH11* | Made Ground/Gneiss | 4.82 | 4.89 |
| BH12* | Made Ground/Gneiss | 4.98 | 5.02 |
| BH13 | Made Ground/Metagabbro | 4.09 | 4.15 |
| BH14 | Made Ground/Gneiss | 3.92 | 4.05 |
| BH15 | Made Ground/Metagabbro | 3.55 | 3.66 |

Note:
mbgl – metres below ground level
* - Groundwater wells installed within the Proposed Development site

As documented in the MKO Phase 2 Report (MKO, 2022), the groundwater levels indicate that the groundwater in the response zone (i.e., screened section) is likely to flow in a southeasterly direction towards Galway Bay. However, given the site's proximity to Galway Bay, the groundwater is likely to be tidally influenced.

Groundwater samples from boreholes BH01 to BH15 were analysed for a similar suite of contaminants to those assessed in the soil analysis (refer to Chapter 6 Section 6.3.7.3 of this EIAR).

The results of the groundwater samples were screened against the AA-EQS, GTV and IGV:

- Reported concentrations of cadmium, lead, benzo(a)pyrene and fluoranthene exceeded the EQS at BH13 (located outside the boundary of the Proposed Development) (refer to Figure 7-8, MKO, 2022). Lead concentrations also exceeded the EQS at BH15 (outside of the Proposed Development site boundary) (refer to Figure 7-8, MKO, 2022), while total cyanide exceeded the EQS at BH10 (within the Proposed Development site boundary). Additionally, benzo(b+k)fluoranthene concentrations exceeded the EQS at BH7 (located outside the boundary of the Proposed Development) (refer to Figure 7-8, MKO, 2022).
- The concentrations of arsenic and lead at BH15 (outside the Proposed Development site boundary) (refer to Figure 7-8, MKO, 2022), lead at BH13 (outside of the Proposed Development site boundary), and Total Petroleum Hydrocarbons (TPH) at BH7 (located outside the boundary of the Proposed Development) (refer to Figure 7-8,

MKO, 2022) exceeded the applicable GTV. In addition, sulphate concentrations in all fifteen (15 No.) groundwater samples, and ammoniacal nitrogen (as $NH_3$) concentrations at thirteen (13 No.) sample locations, were also above the applicable GTV.

- The concentrations of arsenic (at BH15), lead (at BH15 and BH13), total cyanide (at BH10; located within the boundary) and Total Petroleum Hydrocarbons (at BH7) were above the IGV threshold. As mentioned above, it should be noted that IGVs are no longer in use as applicable assessment criteria for groundwater.

As documented in the Phase 2 report (MKO, 2022), contamination reported at BH7, BH10, BH13, BH15, and other groundwater wells within the site investigation area indicates the presence of localised hotspots (both within and outside the boundary of the Proposed Development). These may be directly impacting perched groundwater within the Made Ground. However, the data does not suggest widespread contamination within the Made Ground or the underlying bedrock, as contamination was only detected in a number of groundwater wells. Additionally, the absence of a continuous impermeable clay layer across the site suggests a potential hydraulic connection between groundwater in the Made Ground and that in the bedrock. Consequently, contamination detected in the bedrock may have originated from the Made Ground. Elevated concentrations of ammoniacal nitrogen, boron, and sulphate are likely representative of background levels in the surrounding area. Overall, the risk to controlled waters was assessed as low to medium, given that elevated contaminant concentrations were confined to specific hotspot areas within the Made Ground and underlying bedrock (MKO, 2022).

In addition, it was concluded that the specific contaminants encountered at the site may potentially pose a risk to underground services, particularly water supply pipes. MKO proposed that risk can be mitigated through the use of appropriate pipework material (e.g. barrier pipes for water supply) in some areas of the site, to prevent possible permeation of contaminants into drinking water supplies (MKO, 2022).

Recommendations

Based on the results of the site investigations, the following recommendations, specific to the protection of groundwater and the environment, were presented in the MKO Phase 2 Report (MKO, 2022):

- *"Excavations within the Made Ground, or similar material, are likely to be unstable and dependant on the formation levels may extend below the level of the perched water in the shallow soils and will require dewatering/groundwater control during excavation. These excavations will require shoring during excavation and construction."*
- *"Groundwater control is likely to be achieved within shallow excavations within the Made Ground by adopting a sump and pump system around the perimeter of the excavation."*
- *"Results of chemical testing indicate that shallow groundwater has been impacted by contamination in isolated locations. During groundwater control, this water should be extracted, stored, transported or appropriately treated and disposed of at an appropriate offsite licensed facility."*
- *"Should groundwater be encountered during earthworks or piling operations, dewatering measures may be necessary. Contaminated groundwater may need to be disposed off-site to a licensed waste disposal facility, or it may be passed through a*

*three-stage interceptor and discharged to foul sewer under a discharge license from the local authority."*

- *"In accordance with current UKWIR16 guidance, the use of barrier pipes for water supply may be required in certain areas of the site to prevent potential permeation of contaminants into drinking water supplies."*

#### *7.3.6.4 Site Investigations and Information – 2024 (GII)*

Additional site investigations were carried out by GII, between July 2024 and September 2024 on the instructions of TOBIN, on behalf of the LDA, the applicant. The purpose of the site investigations was to investigate subsurface conditions utilising a variety of investigative methods in accordance with the project specification and included the following:

The scope of the work undertaken to investigate the subsurface conditions was as follows:

- Excavation of fifteen (15 No.) Trial Pits to a maximum depth of 4.00mbgl.
- Nine (9 No.) Cable Percussion boreholes to a maximum depth of 6.80mbgl follow on with rotary core boreholes to a maximum depth of 14.00mbgl at the same locations.
- Installation of three (3 No.) groundwater monitoring wells.
- Geotechnical & Environmental Laboratory testing.
- Report with recommendations.

The site investigation locations are presented in Figure 7-9.

Groundwater Investigation

Groundwater was encountered during the drilling of BH1-05 at a depth of 6.30mbgl and was not encountered during the excavation of the trial pits. Standpipes were installed in BH1-02, BH1-03 and BH1-09 to allow the groundwater level to be determined. The recorded groundwater levels are presented in Table 7-8.

*Table 7-8 Recorded Groundwater Levels (GII, 2024)*

| Well ID | Date | Groundwater Level (mbgl) |
|---|---|---|
| ST1-01 (RC1-03) | 02/09/2024 | 4.16 |
| ST1-02 (RC1-02) | 02/09/2024 | 3.56 |
| ST1-03 (RC1-09) | 02/09/2024 | 3.92 |
| Note:<br>mbgl – metres below ground level | | |

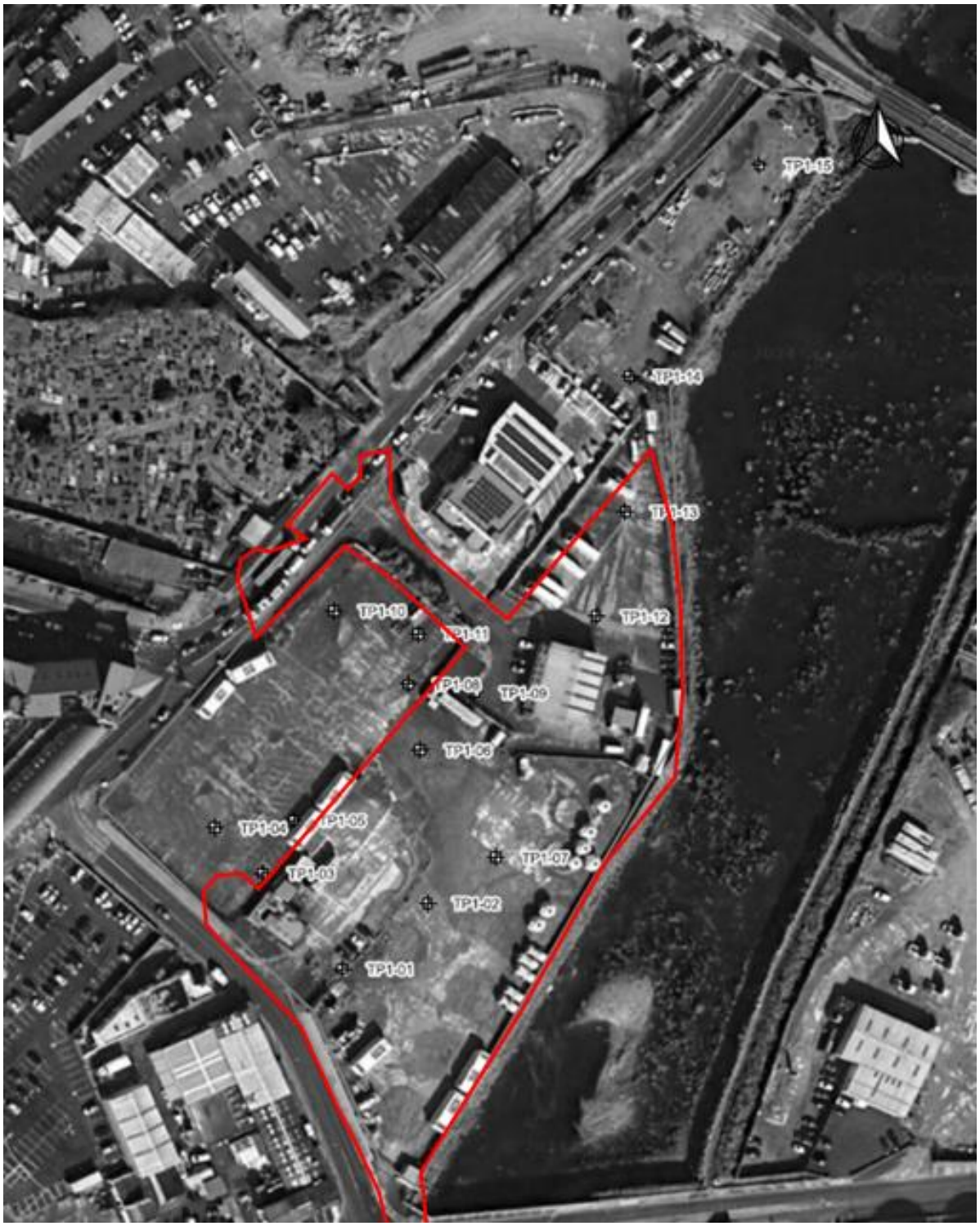



*Figure 7-9 Site Investigations Locations (GII, 2024)*

### 7.3.7 Hydrology

#### *7.3.7.1 Catchment and Surface Water Features*

The Proposed Development site lies within the Galway Bay South East WFD Catchment (Hydrometric Area 29), Carrowmoneash [Oranmore] WFD Sub-catchment (WFD name:

Carrowmoneash [Oranmore]_SC_010 ID: 29_06) (EPA, 2025) and the Carrowmoneash [Oranmore]_10 WFD River Sub Basin (IE_WE_29C050400).

There are no surface water features within the site. The closest surface water features mapped by the EPA (EPA, 2025) within the 2km radius of the site are as follows:

- The Corrib Estuary Transitional Waterbody (ID: IE_WE_170_0700) is located adjacent to the southern and eastern boundaries of the site. The Corrib Estuary ultimately discharges into the Inner Galway Bay North Coastal Waterbody (ID: IE_WE_170_0000) located approximately 2.2km south of the site at its closest point.
- The River Corrib (WFD Name: CORRIB_020; River Waterbody Code: IE_WE_30C020600) is located approximately 0.58km west of the site at the point where it discharges into the Corrib Estuary.
- The Terryland River (WFD Name: TERRYLAND_010; River Waterbody Code: IE_WE_30T010500) is located approximately 1.2km north of the site. As detailed in the Galway City County Geological Site Report (GSI, 2020), the Terryland Stream originates from a narrow channel on the east side of Jordan's Island, just north of the ruins of Terryland Castle. Typically, the Terryland Stream flows eastward toward two stream sinks, north of the site. Although these sinks are near limestone outcrops, the Terryland Stream continues its course through a low-lying area characterised by substantial overburden. The subsoil's low permeability facilitates the conveyance of surface water across the valley until encounters limestone on the southern side. During periods of elevated groundwater levels, these sinks undergo a transformation into resurgences, releasing groundwater into the Terryland Stream. This augmented flow eventually converges with the Corrib River approximately 1.16km northeast of the site. This shift from sink to resurgence categorises these features as estavelles. It is understood that these estavelles are connected to Galway Bay or Lough Atalia (i.e., the Corrib Estuary) through an underground conduit system, although the precise discharge locations remain unknown.

The surface water features mapped by the EPA (EPA, 2025), referencing the WFD status and WFD risk status of the surface waterbodies within a 2km radius of the site are presented in Figure 7-10.

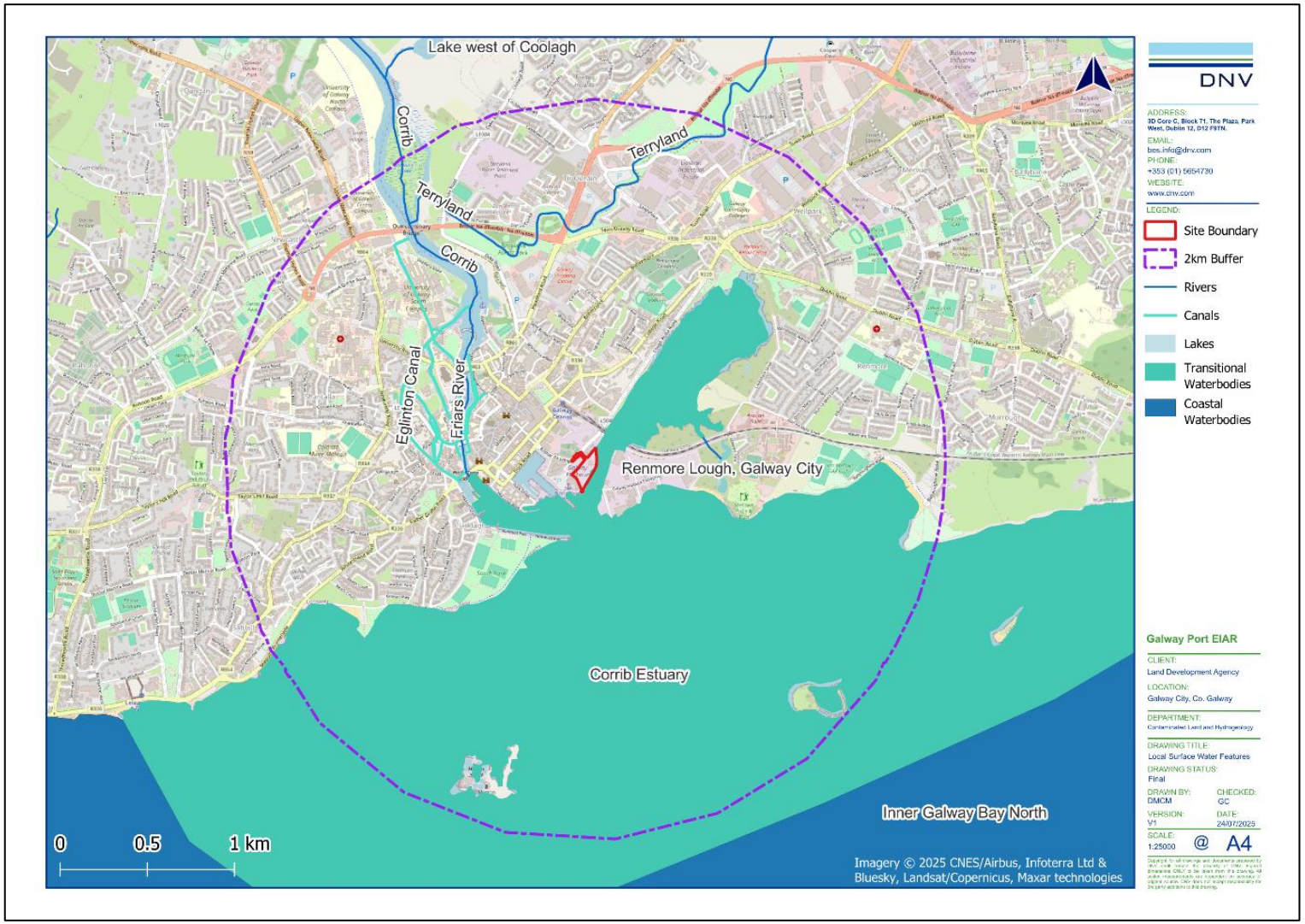



*Figure 7-10 Surface Water Features*

#### *7.3.7.2 Existing Drainage Infrastructure*

As documented in the Civil Works Design Report (TOBIN, 2025), the foul water from the Proposed Development will discharge via gravity to an existing 450mm public foul sewer at the north of the Proposed Development site.

It is proposed to connect a 200mm diameter watermain to an existing 300mm diameter UÉ watermain, which is located running along the existing Lough Atalia Road, north of the proposed site entrance (TOBIN, 2025).

### 7.3.8 Flood Risk Assessment

A Stage 2 Flood Risk Assessment (FRA) was prepared for the site and Proposed Development by TOBIN (TOBIN, 2025). It assessed the potential flood risk associated with fluvial, groundwater, coastal and pluvial flooding.

The Western Catchment Flood Risk Assessment and Management (CFRAM) study (OPW, 2016) identified Galway City as an Area for Further Assessment (AFA) and concluded that a flood relief scheme would be viable and effective for the community. The Coirib go Cósta Galway City Flood Relief Scheme commenced in November 2020 to address the sustainable and effective management of flood risk in the city and will be completed by 2029. The objective of the scheme is to assess, design and deliver a viable, cost-effective, and environmentally sustainable flood relief scheme for Galway City and the subject site falls within the Scheme Area.

The OPW's National Preliminary Flood Risk Assessment (PFRA) mapping indicated that there are no fluvial, pluvial or groundwater flood extents within the Proposed Development site. However, the southwestern boundary of the site is seen as liable to coastal flooding. Hydraulic modelling (i.e., surveyed river geometry and greater model calibration) was carried out through the CFRAM study in 2015, which is considered more accurate than the PFRA study.

The site is located in the proximity to Galway Bay and the River Corrib, which is estuarine in nature, suggesting a heightened risk of coastal flooding. The National Coastal Flood Hazard Mapping (NCFHM) indicates that in a current scenario, approximately 25% of the southwestern portion of the site is inundated in a 1 in 1000-year (0.1% AEP) event, with a small area liable to coastal flooding in a 1 in 200-year (0.5% AEP) event. In the mid-range future scenario (MRFS), approximately 50% of the site is inundated in 1 in 200-year (0.5% AEP) event, and approximately 60% of the site is inundated in a 1 in 1000-year (0.1% AEP) event. A small area along the southeastern and southwestern boundary is liable to coastal flooding in the 1 in 10-year (10% AEP) event. The Irish Coastal Wave and Water Level Modelling Study (ICWWS) water levels in a 1 in 200- and 1 in 1000-year (0.5% and 0.1% AEP) MRFS event are 4.51 meters Ordnance Survey (mOD) and 4.76mOD, respectively. In order to protect the site against the 1 in 1000-year (0.1% AEP) MRFS flood event, which is required for critical infrastructure, the FFL (floor level) at the site is required to be at a minimum 5.05mOD to account for climate change and a freeboard of 300mm. Therefore, it is estimated that the risk of coastal flooding associated with the Proposed Development is minimal.

The report (TOBIN, 2025) concludes the following:

‘‘The proposed development was subject to the Justification Test as portions of the site are located in Flood Zone B. The proposed development satisfied all criteria of the Justification Test’.

'Based on the results of this flood risk assessment, it is estimated that the risk of flooding to the proposed development will be minimal, and that the development will not increase the risk of flooding elsewhere. There is an evident coastal risk at the southwestern portion of the subject site. We propose to mitigate the flood risk to "Highly vulnerable" infrastructure by raising the minimum FFL to 5.05mOD, this allows for a 300mm freeboard above the 1 in 1000-year (0.1% AEP) MRFS event."

### 7.3.9 Water Supply and Drinking Water Source Protection

The GSI groundwater wells and springs database (GSI, 2025) was reviewed to identify registered wells and groundwater sources in the surrounding area. There are six (6 No.) wells or within a 2km radius of the site. Refer to Table 7-9 and Figure 7-11.

There are no Groundwater Source Protection Areas (GSPAs) mapped by the GSI (GSI, 2025) within a 2km radius of the site. The closest Groundwater SPA is the Ballyvaughan PWS 18.9km southwest of the site.

*Table 7-9 Registered Wells and Springs*

| Well Use | Total Number of Wells | Yield ($m^3/d$) |
|---|---|---|
| Agricultural and Domestic Use | 1 | 141.8 (Good) |
| Unknown | 4 | N/A |
| Other | 1 | N/A |

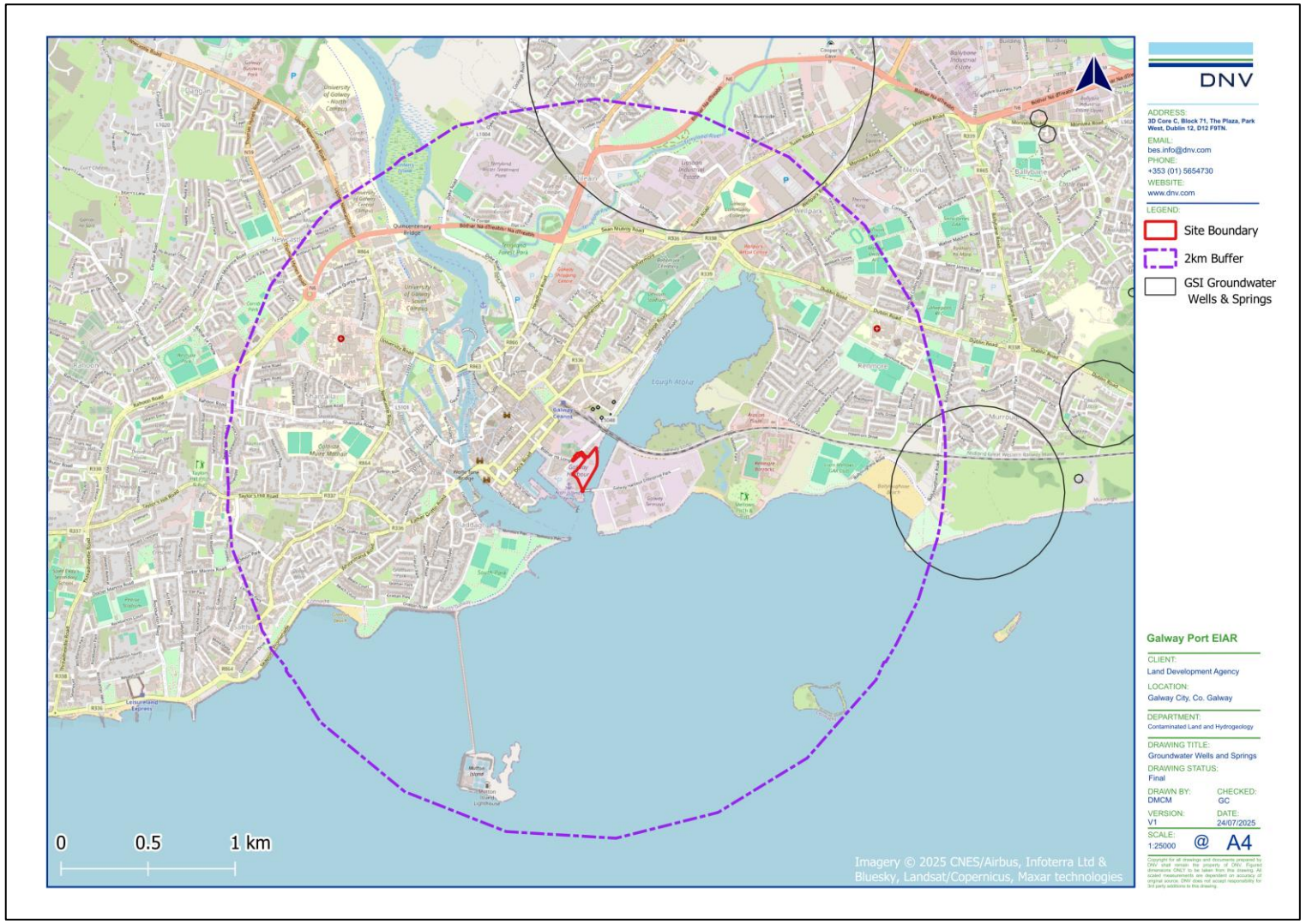



*Figure 7-11 Groundwater Wells and Springs*

### 7.3.10 Water Quality Data

#### *7.3.10.1 EPA Water Quality - Q Values*

The EPA Q-Value assessment is a system of water quality rating based on the biological quality of the water body and abundance for specific invertebrate species. A summary of the Q values for the operational and historical EPA monitoring locations along the River Corrib and the Terryland River (EPA, 2025) is presented in Table 7-10.

*Table 7-10 Q Values*

| River I.D. & Locations | Sample Locations | Monitoring Station | Q-Value & Year |
|---|---|---|---|
| River Corrib-1.25km upstream of site | Salmon Weir Bridge- Galway | RS30C020600 | 4 (2024) |
| Terryland River-2.74km upstream of site | Br d/s Terryland Br on ring road | RS30T010500 | 3-4 (2024) |
| Terryland River-3.5km upstream of site | TERRYLAND - 400 m d/s Terryland Bridge | RS30T010400 | 2-3 (1997) |
| Terryland River-4.9km upstream of site | Bridge on Galway-Headford Rd | RS30T010200 | 3 (2000) |

#### *7.3.10.2 Published Regional Surface Water Quality*

The EPA surface water quality monitoring database (EPA, 2025) was consulted. A summary of the most recent published EPA water quality monitoring data (EPA, 2025) for waterbodies which have a potential hydraulic connection to the site is presented in Table 7-11.

*Table 7-11 Surface Water Quality*

| Waterbody I.D. (Location) | EPA WFD Parameter Quality & Trend Analysis | | | | |
|---|---|---|---|---|---|
| | Parameter | Period | Indicative Quality | Trend | Baseline Conc. (2023)[1] (mg/l) |
| **Surface Water Body** | | | | | |
| Corrib_020 | Ammonia-Total (as N) - Salmon Weir Bridge - Galway | Annual | High | Upwards | 0.026 |
| | Ammonia-Total (as N) - Quincentennial Bridge | Annual | High | Upwards | 0.023 |
| | Total Oxidised Nitrogen (as N) - Salmon Weir Bridge - Galway | Annual | Good | Upwards | 0.418 |
| | Total Oxidised Nitrogen (as N) - Quincentennial Bridge | Annual | Good | Downwards | 0.360 |
| | ortho-Phosphate (as P) – unspecified - | Annual | High | Upwards | 0.009 |

| Waterbody I.D. (Location) | EPA WFD Parameter Quality & Trend Analysis | | | | |
|---|---|---|---|---|---|
| | Parameter | Period | Indicative Quality | Trend | Baseline Conc. (2023)[1] (mg/l) |
| | Salmon Weir Bridge - Galway | | | | |
| | ortho-Phosphate (as P) – unspecified - Quincentennial Bridge | Annual | High | Downwards | 0.005 |
| **Transitional Water Body** | | | | | |
| Corrib Estuary | Chlorophyll a (Fluorescence) | Summer | High | Upwards | 1.200 |
| | | Winter | High | Downwards | 0.465 |
| | Dissolved Inorganic Nitrogen (as N) | Summer | High | None | 0.029 |
| | | Winter | High | None | 0.426 |
| | Ortho-Phosphate (as P) - unspecified | Summer | High | None | 7.100 |
| | | Winter | High | None | 9.200 |
| **Coastal Waterbodies** | | | | | |
| Inner Galway Bay North | Chlorophyll a (Fluorescence) | Summer | High | Upwards | 1.100 |
| | | Winter | High | Downwards | 0.490 |
| | Dissolved Inorganic Nitrogen (as N) | Summer | High | Upwards | 0.022 |
| | | Winter | High | Downwards | 0.229 |
| | ortho-Phosphate (as P) - unspecified | Summer | High | Downwards | 6.050 |
| | | Winter | High | Downwards | 13.000 |
| Inner Galway Bay South | No Chemical Monitoring data available | | | | |
| Outer Galway Bay | Chlorophyll a (Fluorescence) | Summer | High | Upwards | 0.580 |
| | | Winter | High | Downwards | 0.390 |
| | Dissolved Inorganic Nitrogen (as N) | Summer | High | Upwards | 0.025 |
| | | Winter | High | Downwards | 0.162 |
| | ortho-Phosphate (as P) - unspecified | Summer | High | None | 7.100 |
| | | Winter | High | None | 16.000 |

Notes:

1 - The baseline concentration is calculated as the average of the last three years (surface waters) or the midpoint (groundwater) of the relevant period. The baseline year is the year corresponding to the midpoint of the period. The baseline concentration is used to assess the distance to threshold and the parameter status (catchments.ie)

### *7.3.10.3 Published Regional Groundwater Quality*

The EPA groundwater monitoring data (EPA, 2025) was reviewed and there are no groundwater quality monitoring stations within a 2km radius of the site or that are hydraulically connected to the site. However, there is recorded groundwater quality data for the groundwater body beneath the site. Refer to Table 7-12.

*Table 7-12 Groundwater Monitoring Data*

| Groundwater Body | EPA WFD Parameter Quality & Trend Analysis | | | | |
|---|---|---|---|---|---|
| | Parameter | Period | Indicative Quality | Trend | Baseline Conc. (2021)[1] (mg/l) |
| Clarinbridge GWB (IE_WE_G_0008) | Ammonia-Total (as N) - Clarinbridge Kilcolgan RWSS | Annual | Good | Upwards | 0.021 |
| | Chloride - Clarinbridge Kilcolgan RWSS | Annual | Good | Downwards | 20.925 |
| | Conductivity @ 25°C - Clarinbridge Kilcolgan RWSS | Annual | Good | Downwards | 623.306 |
| | Nitrate (as NO3) - Clarinbridge Kilcolgan RWSS | Annual | Good | Downwards | 6.900 |
| | ortho-Phosphate (as P) – unspecified - Clarinbridge Kilcolgan RWSS | Annual | Good | Downwards | 0.021 |

Notes:

1 - The baseline concentration is calculated as the average of the last three years (surface waters) or the midpoint (groundwater) of the relevant period. The baseline year is the year corresponding to the midpoint of the period. The baseline concentration is used to assess the distance to threshold and the parameter status (catchments.ie)

### *7.3.10.4 Receiving Water Quality – Galway Wastewater Treatment Plant (WWTP)*

Foul water from the site will discharge via the Galway WWTP to the Corrib Estuary transitional waterbody (EU Code: E_WE_170_0700) and the Inner Galway Bay North coastal waterbody (EU Code: IE_WE_170_0000).

The Galway WWTP is operated under relevant statutory approvals. The most recent available Annual Environmental Report (AER) for the Galway WWTP is 2024 (UÉ, 2024). The AER identified that the final effluent was compliant with the Emission Limit Values (ELVs) specified in the wastewater discharge license (EPA Licence No. D0050-01). The 2024 AER notes the following in relation to ambient monitoring for the treatment plant discharge:

*'The coastal/transitional ambient monitoring results do not meet the required EQS. The EQS relates to the Oxygenation and Nutrient Conditions set out in the Surface Water Regulations 2009.*

*The WWTP discharge was compliant with the ELV's set in the wastewater discharge licence.*

*Based on ambient monitoring results a deterioration in Escherichia coli cfu/100ml, Intestinal Enterococci cfu/100ml (Grattan Beach), concentrations downstream of the effluent discharge is noted.*

*A deterioration in water quality has been identified, however it is not known if it or is not caused by the WWTP.*

*Other causes of deterioration in water quality in the area are: Risk of deterioration in water quality due to expected heavy rainfall, Water quality deteriorated due to suspected contamination of urban surface waters discharging into bathing water.*

*The discharge from the wastewater treatment plant does not have an observable negative impact on the Water Framework Directive status.*

*The discharge from the wastewater treatment plant does not have an observable impact on the coastal/transitional water quality.'*

#### *7.3.10.5 Water Framework Directive*

The WFD status for river, lake, groundwater, transitional and/or coastal water bodies that have a potential hydraulic connection to the subject site as recorded by the EPA (EPA, 2025) in accordance with European Communities (Water Policy) Regulations 2003 (SI no. 722/2003) are provided in Table 7-13.

*Table 7-13 Water Framework Directive Status*

| Waterbody Name | Waterbody EU Code | Location from Site | Distance from Site (km) | WFD Status (2016-2021)[1] | WFD Risk – 3rd Cycle | Hydraulic Connection to the Site |
|---|---|---|---|---|---|---|
| **Surface Water Bodies** | | | | | | |
| Corrib_020 (Corrib River) | IE_WE_30C020600 | West | 0.58 | Good – High Confidence | Not at Risk | Possible tidal connection |
| Terryland_010 (Terryland Stream) | IE_WE_30T010500 | Northwest | 1.16 | Moderate | At Risk | No, upstream of the site |
| **Transitional Water Bodies** | | | | | | |
| Corrib Estuary | IE_WE_170_0700 | South and East | 0.0 | Moderate | Under Review | Yes, Adjacent to site. Also receives treated effluent from the Galway WWTP |
| **Coastal Water Bodies** | | | | | | |
| Inner Galway Bay North | IE_WE_170_0000 | South | 2.2 | Good | Not at Risk | Yes, downstream of the site via Corrib Estuary and receives |

| Waterbody Name | Waterbody EU Code | Location from Site | Distance from Site (km) | WFD Status (2016-2021)[1] | WFD Risk – 3rd Cycle | Hydraulic Connection to the Site |
|---|---|---|---|---|---|---|
| | | | | | | treated effluent from the Galway WWTP |
| Inner Galway Bay South | IE_WE_160_0000 | South | 5.5 | High | Not at Risk | Yes, downstream of site via Corrib Estuary and Inner Galway Bay North |
| Outer Galway Bay | IE_WE_100_0000 | Southwest | 6.8 | High | Not at Risk | Yes, downstream of the Inner Galway Bay North and Inner Galway Bay South coastal waterbodies |
| **Groundwater Bodies** | | | | | | |
| Clarinbridge | IE_WE_G_0008 | Beneath the site | 0.0 | Good | Not at Risk | Yes, beneath the site |

Notes:

1. The 3rd cycle (2016–2021 monitoring) data was published in 2022 and forms the basis of the current River Basin Management Plan (RBMP) (2022–2027). The 4th cycle monitoring (2019–2024) is currently underway, with results expected to inform the next RBMP (2027–2033). The final national assessment for this cycle is expected to be published by the Environmental Protection Agency (EPA) in Q4-2025. Updated numeric data from 2023 ('baseline concentration') is presented in Table 7-11 as per catchments.ie.

### 7.3.11 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 are four (4 No.) Natura 2000 sites that are identified with a potential hydraulic connection to the site and Proposed Development. There is also one (1 No.) pNHA identified with a potential hydraulic connection to the site and the Proposed Development. The Natura 2000 sites and other protected and designated sites or areas with a potential hydraulic connection to the site are summarised below and presented in Figure 7-12.

- Lough Corrib SAC (Site Code: 000297) – approximately 0.015km west of the site.
- Lough Corrib SAC (Site Code: 004042) – approximately 3.9km northwest of the site.
- Galway Bay Complex SAC (Site Code: 000268) – adjacent to the site.

- Inner Galway Bay SPA (Site Code: 004031) – adjacent to the site.

Other Natura 2000 Sites that are identified with a potential hydraulic connection to the Proposed Development site, however, are located outside of a 15km buffer zone include:

- Black Head-Poulsallagh Complex SAC (Site Code: 000020).
- Inisheer Island SAC (Site Code: 001275).
- Inishmaan Island SAC (Site Code: 000212).
- Inishmore Island SAC (Site Code: 000213).
- Inishmore Island SPA (Site Code: 004152).
- Kilkieran Bay And Islands SAC (Site Code: 002111).

There is one (1No.) proposed NHA identified with a potential hydraulic connection to the Proposed Development:

- Galway Bay Complex pNHA (Site Code: 000268).

Other proposed NHAs that are identified with a potential hydraulic connection to the Proposed Development site, however, are located outside of a 15km buffer zone, include:

- Black Head-Poulsallagh Complex pNHA (Site Code: 000020).
- Inisheer Island pNHA (Site Code: 001275).
- Inishmaan Island pNHA (Site Code: 000212).
- Inishmore Island pNHA (Site Code: 000213).

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 and the NIS (see Appendix 5-4).

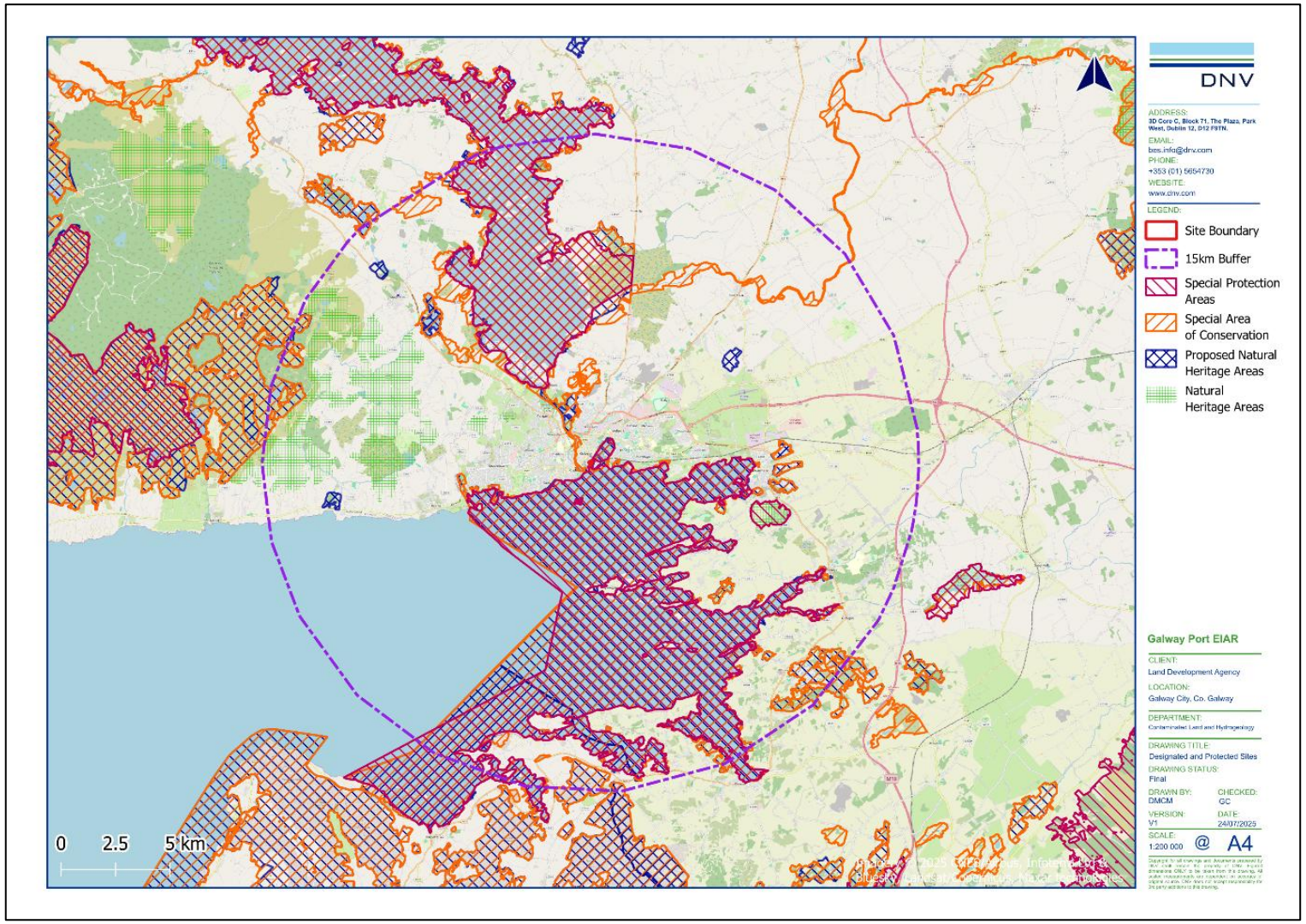



*Figure 7-12. Designated and Protected Sites*

#### *7.3.11.1 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, 2025) hydraulically downstream of the site. However, the River Corrib (IE_WE_30C020600) 1.25km upstream of site and the groundwater body beneath the site, the Clarinbridge GWB (IE_WE_G_0008) are classified under Article 7 Abstraction for Drinking Water.

#### *7.3.11.2 Shellfish Areas*

Although the Shellfish Waters Directive (SWD) has been repealed (in 2013, and was replaced by the EU Water Framework Directive (2000/60/EC), 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 no. 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 Clarinbridge/Kinvara Bay (IE_WE_160_0000) located approximately 5.8km south of the site.

#### *7.3.11.3 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 Lough Derg on the River Shannon (IELK_SH_1994_0007-Urban Wastewater Treatment Directive Sensitive Area) located approximately 53.9km southwest of the site at its closest point. In addition, the closest nutrient-sensitive area (rivers) is the Fergus (IERI_SH_2010_0003-Urban Wastewater Treatment Directive Sensitive Area) located approximately 47.5km south of the site at its closest point.

#### *7.3.11.4 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 Grattan Road Beach (IEWEBWT170_0700_0100), located approximately 1.5km southwest of the site. The Ballyloughane Beach (IEWEBWT170_0700_0200) bathing water area is located approximately 1.5km east of the site. There is a potential connection to those bathing water areas through the Corrib Estuary Transitional Waterbody.

## 7.4 Importance of Receiving Environment

The receiving water bodies have been assigned a WFD Status of 'good' for groundwater, and 'moderate' and 'good' for the closest surface water bodies hydraulically connected to the site of the Proposed Development, namely the Corrib Estuary and Corrib River respectively (EPA, 2025). The bedrock aquifer beneath the site is classified as Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones.

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 'low' importance.

## 7.5 Characteristics of the Proposed Development

A description of the Proposed Development is outlined in Chapter 2 (Description of the Proposed Development) of this EIAR.

Components of particular relevance with respect to hydrology and hydrogeology are discussed below.

### 7.5.1 Construction Phase

The construction phase of the Proposed Development will include:

- The GII report (GII, 2024) recommended the use of pile foundations for the proposed structures at the site given the presence of made ground across the site. Additionally, it was recommended that the floor slab should be suspended and also supported on the building piles. As stated in the GII report (GII, 2024) in regard to the short-term temporary excavations in the cohesive deposits, the excavations will remain stable, for a limited time only and will require to be appropriately battered or the sides supported if the excavation is below 1.25mbgl.
- Excavation of soil and subsoil will be required to allow the construction of roads, building foundations, drainage, and ancillary services. Excavation depths will range from 2.398mbgl to 3.994mbgl.
    - It is estimated by TOBIN Engineering that approximately 11,594.268m$^3$ of soil and subsoil including made ground will be excavated as part of remedial excavations at the site (refer to Drawing No. 11910-2015 & 11910-2016 submitted with the planning application under separate cover).
    - An additional 4,469.252m$^3$ will be excavated to achieve formation levels, which will be reused onsite (refer to Drawing No. 11910-2015 & 11910-2016submitted with the planning application under separate cover).
    - Where possible, excavated soil and subsoil materials will be reused for engineering fill and landscaping subject to assessment their suitability for use in accordance with engineering and environmental specification for the Proposed Development. It is estimated that 4,469.252m$^3$ of material excavated during bulk excavations to achieve formation levels will be re-used onsite. However, all soil and subsoil materials including made ground excavated as part of remedial excavations (approximately 11,59.268 m$^3$) will be removed from site. This material will be taken for appropriate offsite reuse, recovery, recycling and / or disposal in accordance with the procedures outlined in the Resource and Waste Management Plan (AWN, 2025).

  - It is anticipated that there will be no requirement for the excavation of bedrock during the construction stage of the Proposed Development.
- The volume of fill required to achieve formation levels is approximately 10,353.52m$^3$. The importation of 5,884.268m$^3$ soil and subsoil materials will be required for the construction of the Proposed Development. Contract and procurement procedures will ensure that all imported soil and subsoil materials required will be sourced from reputable suppliers operating in a sustainable manner and in accordance with industry conformity/compliance standards and statutory obligations.
- The demolition of the existing structures and removal of hardstanding areas onsite will also be required. This material will be taken for appropriate offsite reuse, recovery, recycling and / or disposal in accordance with the procedures outlined in the Resource and Waste Management Plan (AWN, 2025).
- Temporary stockpiling of excavated material will be required pending reuse onsite (where required), or removal offsite.
- There may be a surplus of building materials, such as timber off-cuts, broken concrete blocks, cladding, plastics, metals and tiles generated and there may also be excess concrete during construction which will need to be disposed of (AWM, 2025).
- The importation of aggregate fill materials will be required for the construction of the proposed development (i.e., natural stones and gravel, aggregates, and related fill products). All aggregate materials will be sourced from locally available quarries in accordance with the appropriate statutory guidelines.
- Groundwater levels were measured at the site during previous investigations ranging from 2.9mbgl (BH08; MKO, 2022) to 5.02mbgl (BH12; MKO, 2022). The maximum excavation depth will be 3.994mbgl and therefore, there may be a requirement to dewater shallow groundwater if encountered during the construction phase of the Proposed Development. Additionally, there may be a requirement for management of surface water (rainwater) within excavations during groundworks.
- Construction of new surface water drainage (refer to Section 7.5.2.1) designed in accordance with the principles and objectives of Sustainable Drainage Systems (SuDS) and the Greater Dublin Sustainable Drainage System (GDSDS) and the requirements of Galway City Council (GCC).
- Construction of new foul and mains water connections (refer to Section 7.5.2.2 and Section 7.5.2.3) in accordance with UÉ Code of Practice for Wastewater Infrastructure 2020 & Standard Details for Wastewater Infrastructure (IW-CDS-5030-03) and UÉ's Code of Practice for Water Infrastructure (IW-CDS-5020-03).
- In accordance with current UKWIR16 guidance, the use of barrier pipes for water supply may be required in certain areas of the site to prevent potential permeation of contaminants into drinking water supplies.

### 7.5.2 Operational Phase

#### *7.5.2.1 Surface Water Drainage*

Surface water runoff from the Proposed Development will be managed in a surface water drainage system designed in accordance with the principles and objectives of:

- Sustainable Drainage Systems (SUDS).
- Coirib go Cósta Galway City Flood Relief Scheme.
- Galway City Council City Development Plan 2023-2029.

- Greater Dublin Sustainable Drainage Scheme (GDSDS).

The Greater Dublin Sustainable Drainage Scheme (GDSDS) provides a well-established, comprehensive framework of best practice principles and standards for SuDS that are widely recognised across Ireland. It is used as a benchmark for sustainable drainage design due to its robustness and recognition, supporting the delivery of a surface water system that aligns with both local and national objectives. The GDSDS addresses the issue of sustainability by requiring designs to comply with a set of drainage criteria that aim to minimise the impact of urbanisation by replicating the runoff characteristics of greenfield sites.

As documented in the Civil Works Design Report (TOBIN, 2025), it is proposed that the surface water (stormwater) drainage system for the Proposed Development will cater for all surface water runoff from hard surfaces (i.e., impermeable) within the development, including roadways, carparks, footways, and roofs. The Proposed Development has been divided into two (2 No.) catchment areas, Network A, and Network B. These networks will each direct flow through a petrol interceptor before discharging the stormwater into the proposed attenuation units (Attenuation A and Attenuation B). Accumulated stormwater will discharge to the existing stormwater network. Ultimate disposal is to outfall in the public storm culvert adjacent to the bridge to the south of the site, which in turn discharges into the Galway Bay at the mouth of Lough Atalia.

All velocities within the networks fall within the limits of 0.8 and 3m/sec as set out in 'Recommendations for Site Development Works' as published by the Department for the Environment (1998). The attenuation system is proposed to discharge surface water runoff from the site to the existing stormwater network. The required storage requirements have been designed based on the CIRIA SuDS Manual C753 Section 11.3 Hydraulic Design.

- Attenuation A – will require catering for a water volume of 154m$^3$.
- Attenuation B – will require catering for a water volume of 110m$^3$.

The attenuation units are designed to hold water for the largest storage required over a 48-hour storm period, with rainfall depths taken for the 100-year return period + 20% for climate change. All proposed attenuations have been located to cater for the associated catchment area. All surface water generated onsite will pass through a bypass Petrol Interceptor prior to outfall to each proposed attenuation unit (Attenuation A and Attenuation B) in Network A, and Network B which are designed to separate hydrocarbons from the water before discharging to the attenuation units (i.e., preventing hydrocarbons from entering the tank).

As indicated in the Civil Works Design Report (TOBIN, 2025), '*in calculating the attenuation storage and pipe capacities, a conservative approach has been adopted wherein no infiltration is permitted. Approach 1 is adopted to provide a simplified basis for design compatible with Causeway Flow modelling software. If, after conclusive removal of all contaminated ground, it is desirable to the Galway City Council to entertain the possibility of infiltration to ground within the site to reduce the hydraulic loading on their existing storm water culvert within the public road (into which the proposed outfall discharges), the impermeable liner beneath the permeable surfaces and attenuation zones may be replaced with a suitable permeable geotextile. This approach will ensure that an approved design will accommodate the maximum required storage capacity from the outset but also allow for possible reductions in discharge rates into the public storm system as the opportunity presents itself*'.




*Figure 7-13 Proposed SuDS and Surface Water Drainage Layout (TOBIN Drawing Number – 11910-2004)*

The requirements of SuDS are typically addressed by the provision of the following elements specific for the Proposed Development:

- Interception storage.
- Attenuation storage.

Those elements have been proposed by implementing infiltration tanks with a calculated holding volume. All SuDS measures will be designed in accordance with the EPA's document 'Guidance on Authorisation of Discharges to Groundwater 2011'.

SuDS measures (i.e., interception storage) proposed will be a combination of water butts, rain gardens, swales, tree pits, permeable paving, and drainage kerbs with infiltration trenches/filter strips. Storage capacity has been calculated and provided in discharge soakaways as though no interception storage were provided. This mitigates any seasonal performance issues with the interception storage measures.

SuDS objectives relate to the following elements:

1. Water Quality - A petrol interceptor has been included as a general SuDS measure for water treatment. In addition, the drainage kerb and infiltration trench/rain garden combination allow for isolation of hydrocarbons for nature-based treatment within appropriate green zones.
2. Water Quantity - The drainage system is designed to achieve the required thresholds in the event of localised exceedance of SuDS measures or seasonally sensitive capacity reductions, therefore, ensuring that greenfield runoff rates are maintained.
3. Amenity - Proposed rain gardens and tree pits integrate with the broader landscaping strategy.
4. Biodiversity - The landscaping design requires further development in the detailed design stage to accommodate further SuDS measures to leverage opportunities for biodiversity. However, the SuDS measures already proposed support the landscaping measures as might be employed to meet the biodiversity goals of the development.

The layout of the proposed surface water drainage network is presented in TOBIN Drawing No.11910-2004 submitted with the planning application under separate cover and in Figure 7-13.

#### *7.5.2.2 Foul Drainage*

As documented in the Civil Works Design Report (TOBIN, 2025), the foul water from the Proposed Development will discharge via gravity to an existing 450mm public foul sewer in the north of the Proposed Development. The proposed foul network has been designed using Causeway Flow software with a capacity of six times the dry weather flow in accordance with the Uisce Éireann (UÉ) Code of Practice for Wastewater Infrastructure UE-CDS-5030-03.

It is proposed that all piping structures in the network will be thermoplastic structured wall pipes with a maximum pipe diameter of 225mm and maximum and minimum gradients of 1/60 and 1/200, respectively. All velocities within the foul network comply with UÉ Code of Practice for Wastewater Infrastructure requirement for flow velocities greater than self-cleansing velocity (0.75m/sec) and less than 2.5m/s as per Section 3.6 of the UÉ Code of Practice for Wastewater Infrastructure.

A pre-connection enquiry (PCE) for the wastewater discharge from a multi/mixed use 408 units was submitted to UÉ. A Confirmation of Feasibility (COF) was issued by UÉ on the 23rd of July 2024 (UÉ COF Reference: CDS24004596). The UÉ COF confirmed the connection to be feasible, subject to upgrades, although it confirmed that there is sufficient capacity for the Proposed Development. The UÉ COF states, '*the connection from this site by gravity or pumping will be to the 450mm sewer on Bothar na Long. If gravity is feasible, then a 140m upgrade/extension of the existing sewer will be required to connect the proposed development to the existing public network. Any such network extension would have to be entirely funded by the Customer. The proposed development would require assessment at connection application stage to ensure capacity exists*'. The Applicant will ensure all works are funded as required by UÉ.

The layout of the proposed foul water drainage network is presented in TOBIN Drawing No. 11910-2002 submitted with the planning application under separate cover. Refer to Figure 7-14.

Foul water from the Proposed Development will be treated in the Galway WasteWater Treatment Plant (Mutton Island WWTP) (Discharge Licence No. D0050-01) before ultimately discharging to the Corrib Estuary transitional waterbody (ID: IE_WE_170_0700).




*Figure 7-14 Proposed Foul Layout (TOBIN Drawing Number – 11910-2002)*

#### *7.5.2.3 Water Supply*

As documented in the Civil Works Design Report (TOBIN, 2025), it is proposed to connect a 200mm diameter watermain to an existing 300mm diameter UÉ watermain, which is located running along the existing Lough Atalia Road, north of the proposed site entrance. The proposed 200mm polyethylene (PE) watermain is the required size to service the development as per UÉ specifications. All watermain designs will be fully vetted by UÉ prior to receiving an offer to connect.

In accordance with Local Authority/ UÉ standards, a water meter and Logging Device (Larson Type) are proposed at the connection into the proposed site. A sluice valve, strainer and 200mm diameter by-pass arrangement is also proposed to allow for possible disconnection of water meters by the Local Authority/ UÉ.

A pre-connection enquiry (PCE) for the wastewater discharge from a multi/mixed use of 408 units was submitted to UÉ. A Confirmation of Feasibility (COF) was issued by UÉ on the 23rd of July 2024 (UÉ COF Reference: CDS24004596). The UÉ COF confirmed the connection to be feasible without infrastructure upgrade by Irish Water and there is also sufficient capacity for the Proposed Development. All watermain designs will be fully vetted by UÉ prior to receiving an offer to connect.

The watermain layout has been designed in accordance with UÉ Code of Practice for Watermain Infrastructure (UE-CDS-5020-03).

The layout of the proposed water supply is presented in TOBIN Drawing Number - 11910-2001 submitted with the planning application under separate cover and Figure 7-15.




*Figure 7-15 Proposed Watermain Layout (TOBIN Drawing Number – 11910-2001)*

## 7.6 Potential Effect of the Proposed Development

The procedure for 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 assessment will identify the likely impacts during the construction and operational phases of the Proposed Development site. This will involve assessing the significance of any potential effects by determining the sensitivity of the receptors and the magnitude of the potential effect.

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 Hydrological and Hydrogeological Flow Regime*

There will be no abstraction of water for use during construction works (i.e. dust suppression, welfare facilities). Water supply will be from the mains supply in accordance with a connection agreement from UÉ and therefore there will be no impact on water resources.

During the construction phase, there will be no direct discharges to or abstractions from surface water or groundwater at the Proposed Development site and diversions of water courses are not required for the construction phase.

Shallow groundwater may be encountered during excavations required to achieve the required formation levels for the Proposed Development site, including building foundations, surface water and foul water drainage, roads and all other associated infrastructure. Groundwater control is likely to be achieved within shallow excavations within the Made Ground by adopting a sump and pump system around the perimeter of the excavation (MKO 2022). Localised dewatering or sump pumping during the excavations may result in a ‘negative’, ‘imperceptible to slight’ and ‘temporary’ impact within a very localised zone of the aquifer only and there will be no impact on the flow regime of receiving water bodies. This impact is considered non-significant in the context of the EIA Directive.

#### *7.6.1.2 Water Quality*

**Excavation of Soil and Subsoil**

The excavation of made ground impacted with anthropogenic contamination (i.e., residual contamination in soil) and permanent removal offsite is a design requirement of the Proposed Development. As documented in Chapter 6 of this EIAR, as part of incorporated design measures for the Proposed Development, in-situ soil validation samples will be collected to ensure that residual contamination in soil has been removed offsite. Therefore, it is considered that there will be a ‘positive’, ‘moderate’ and ‘long-term’ impact on the quality of shallow soils underlying the site and subsequent improvements to the quality of groundwater. Therefore, there is no significant adverse, effect in the context of the EIA Directive associated with the excavation of soil from the site.

**Contaminant Mobilisation**

There will be no direct discharge to groundwater or surface water during the construction phase of the Proposed Development. Surface runoff will be managed during construction and there will be no unauthorised discharges of water from the site. However, in the event of a rainfall event, surface runoff entering the open excavations could result in mobilisation of identified hydrocarbon and other residual contamination in soil and leaching and migration to groundwater beneath the site. In addition, if existing monitoring wells are inadvertently damaged there could be a potential for migration of surface runoff or other sources to migrate directly to groundwater. Accordingly, this could result in a 'negative', 'moderate to significant' and 'medium-term' impact on groundwater, the Corrib Estuary transitional waterbody and associated downstream receptors. This impact is considered significant in the context of the EIA Directive. Appropriate controls will be in place to prevent this unlikely scenario, refer to Section 7.7 below.

Any dewatering required, including the pumping of groundwater, where encountered in excavations, could alter the local groundwater flow regime and contaminant distribution within the subsurface. Taking account of the existing groundwater quality beneath the site this could result in a 'negative', 'moderate to significant' and 'medium-term' impact on groundwater, the Corrib Estuary Lower and associated downstream receptors. This impact is considered significant in the context of the EIA Directive. Appropriate controls will be in place to prevent this unlikely scenario, refer to Section 7.7 below.

**Dewatering**

Chemical testing results indicate that shallow groundwater has been impacted by contamination in isolated areas. Where water must be pumped from the excavations (i.e., groundwater and/or rainwater), water will be disposed of offsite at a licensed waste facility or discharged by the appointed contractor, following appropriate treatment (e.g., settlement or hydrocarbon interceptor), to sewer, watercourses or groundwater in accordance with the necessary discharge licences issued by UÉ under Section 16 of the Local Government (Water Pollution) Acts and Regulations for any water discharges to sewer or from Galway City Council under Section 4 of the Local Government (Water Pollution) Act 1977, as amended in 1990 for discharges to surface water / groundwater. There will be no unauthorised discharge of water (groundwater / surface water runoff) to sewer, watercourses or groundwater during the construction phase of the Proposed Development. Therefore, the potential impacts will have been adequately assessed and mitigated as part of the statutory consent and there will be 'neutral', 'imperceptible' and 'temporary' impact on the receiving water environment. It is noted that this impact is considered non-significant in the context of the EIA Directive.

**Uncontrolled Release of Materials**

The groundwater vulnerability will temporarily be increased during the construction phase. Construction activities will include the use of potentially hazardous materials including cementitious materials, fuels and oils and other materials. A potential uncontrolled release of materials could result from the failure of secondary containment, or a materials handling accident could also result in a 'negative', 'significant' and 'medium-term' impact on the receiving environment (i.e., underlying Clarinbridge GWB and the Corrib Estuary transitional waterbody and downstream waterbodies). 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. Appropriate controls will be in place to prevent this unlikely scenario, refer to Section 7.7 below.

The release of suspended solids entrained in surface runoff from haul routes to / from the site or other contaminants from groundworks areas and stockpiled soils could potentially enter offsite road gullies before discharging to the Corrib Estuary. The appointed contractor will ensure that any run-off 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 offsite. However, in the absence of mitigation measures, there is a potential 'negative', 'slight to moderate' and 'short-term' impact on the receiving water quality and WFD status of the Corrib Estuary 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 7.7.2.

**Piling**

During the construction phase of the Proposed Development, piling could act as a potential conduit for contaminants to migrate to groundwater. The potential for contaminant migration mainly depends on the piling method and the materials involved, such as grout and other construction substances. In the event of such scenarios, it is considered that this could result in 'negative', 'significant' and 'medium-term' impact on a local area of the underlying aquifer environment and the receiving Corrib Estuary Lower and associated downstream receptors. This impact is considered significant in the context of the EIA Directive. Appropriate controls, including the development of a Piling Risk Assessment will be in place to prevent this unlikely scenario, refer to Section 7.7.2.4 below.

**Flood Risk**

During a flood event there is the potential for pollutants derived from construction materials to be mobilised by flood waters. Overall, flood events during the construction phase have the potential to have 'negative', 'temporary', 'moderate to significant' effect on receiving hydrogeological and hydrological receptors depending on the nature of the incident and is considered significant in the context of the EIA Directive.

**Wastewater**

Foul water discharge from the temporary welfare units at the site during the construction phase will be either tankered offsite in accordance with waste management legislation or discharged under temporary consent to the UÉ mains foul network for treatment at Galway WWTP subject to agreement with UÉ. 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.

The release of foul water during connection to the live sewers could result in a release of contaminants to ground or as overland runoff. Due to the temporary and phased nature of the construction phase of the Proposed Development, in the absence of mitigation, the potential impact from an accidental spillage is considered to be 'negative', 'moderate' and 'short-term and is considered non-significant in the context of the EIA Directive.

### 7.6.2 Operational Phase

During the Operational Phase of the Proposed Development, there is limited potential for any adverse impact on the receiving water (hydrological and hydrogeological) environment at the site taking account of the design of the Proposed Development.

#### *7.6.2.1 Hydrological and Hydrogeological Flow Regime*

The Proposed Development site comprises brownfield lands, which according to the findings of previous site investigations comprises a Made Ground layer present at the site. To accommodate the Proposed Development, Made Ground, soils and subsoils will be excavated and removed offsite for disposal.

The change in cover may result in change in the infiltration patterns due to the incorporation of the SuDS elements within the surface water drainage network, which will encourage continued groundwater recharge. However, as the bedrock aquifer beneath the site is a poor aquifer (bedrock which is generally unproductive except for local zones), the potential for infiltration and recharge may be limited. Therefore, it is considered that there will be little to no change to the overall recharge potential to the aquifer in the Clarinbridge GWB. Taking account of the baseline hydrogeological setting and nature of the Proposed Development there will be a 'neutral', 'imperceptible' and 'permanent' effect on the hydrogeological flow regime which is considered non-significant in the context of the EIA Directive.

The surface water drainage at the Proposed Development has been designed in accordance with SuDS and satisfies the requirements of the Greater Dublin Strategic Drainage Study (GDSDS) to meet the following design criteria:

- Criterion 1 – River Water Quality Protection.
- Criterion 2 – River Regime Protection.
- Criterion 3 – Level of Service (Flooding) / Flood Risk Assessment.
- Criterion 4 – River Flood Protection

As documented in the Stage 2 FRA (TOBIN, 2025), the Proposed Development was subject to the Justification Test as portions of the site (i.e., southwestern portion) are located in Flood Zone B. The site is located in the proximity to Galway Bay and the River Corrib, which is estuarine in nature, suggesting a heightened risk of coastal flooding. However, based on the results of the Justification Test, it is estimated that the risk of flooding to the Proposed Development will be minimal, and will not increase the risk of flooding elsewhere. Therefore, it is considered that the potential flooding impacts associated with the Proposed Development are 'neutral', 'imperceptible' and 'long-term' and are considered non-significant in the context of the EIA Directive

#### *7.6.2.2 Water Quality*

The design and construction of the Proposed Development in accordance with current Building regulations will ensure that the site will be suitable for use during the operational phase of the Proposed Development as a residential development taking account of the hydrogeological site setting.

There will be no significant sources of contamination at the site during the operational phase of the Proposed Development as these will have been removed during the construction phase.

There will be no requirement for bulk storage of petroleum hydrocarbon-based fuels during the operational phase, as the main operating systems for heating will be either communal (centralised) heat pump solution or an Exhaust Air Heat Pump (EAHP) solution. Further details are provided in Chapter 13 of this EIAR.

During the operational phase, there is limited potential for discharge of contaminated runoff to receiving water courses. Surface water runoff from the Proposed Development will be managed in accordance with the principles and objectives of SuDS, treated, and attenuated before discharging to the Corrib Estuary transitional waterbody. The measures incorporated in the SuDS design (i.e., interception storage) will be a combination of water butts, rain gardens, swales, tree pits, permeable paving, and drainage kerbs with infiltration trenches/filter strips. Those systems will be effective in the treatment and removal of any contaminants entrained in surface water runoff. The Proposed Development also includes petrol interceptors prior to discharge from the site that will be effective in the removal of hydrocarbons that may enter the drainage system in particular in the event of worst-case scenario spill incident (e.g. collision on the roadway resulting in the loss of fuel from a vehicle). It is considered that the likely impact on the water quality from surface water runoff will be 'positive', 'imperceptible' to 'slight' and 'permanent' and is considered non-significant in the context of the EIA Directive.

The groundwater beneath the site and areas immediately surrounding the site demonstrates localised occurrences of organic and inorganic contaminants assumed to be associated with former land use, which includes hydrocarbons, heavy metals and a number of PAH (polycyclic aromatic hydrocarbons) compounds. In the absence of suitable remedial measures, the presence of contaminants in the groundwater beneath the site poses a 'negative,' 'moderate to significant' and 'long-term' risk to water supply infrastructure. In accordance with current UKWIR16 guidance, the design for the proposed development will include the use of barrier pipes for water supply in certain areas of the site to prevent potential permeation of contaminants into drinking water supplies. Accordingly, it is considered that there will be a 'neutral', 'imperceptible' and 'permanent' impact to water supply and future occupants of the site and is considered non-significant in the context of the EIA Directive

The existing ground conditions at the site primarily comprise tarmac or reinforced concrete hardstanding, with some localised areas of crushed rock fill. The Proposed Development will also include extensive hardstanding. There will be no discharges to ground other than rainfall infiltrating unpaved landscaped areas and limited recharge via SuDS measures incorporated into the surface water drainage network. As such, the rate of infiltration to groundwater beneath the site is expected to remain largely unchanged or may be slightly reduced. Consequently, the impact on the underlying groundwater is considered to be 'positive to neutral', 'slight', and 'permanent', due to the reduced potential for mobilisation or leaching of residual soil contaminants to the underlying aquifer and is therefore not likely to result in significant adverse effects requiring further assessment under the EIA Directive.

As documented in the Civil Works Design Report (TOBIN, 2025), foul water from the Proposed Development will be treated in the Galway WWTP (EPA Licence No. D0050-01) before ultimately discharging to the Corrib Estuary transitional waterbody, in accordance with the requirements from the UÉ CoF (UÉ Reference: CDS24004596) and other applicable statutory consents verifying capacity at the WWTP for the Proposed Development. Therefore, there will

be a ‘neutral’, ‘imperceptible’, ‘long-term’ impact on receiving water quality and WFD status and is considered non-significant in the context of the EIA Directive

As documented in the Stage 2 FRA (TOBIN, 2025), the Proposed Development was subject to the Justification Test as portions of the site (i.e., southwestern portion) are located in Flood Zone B due to potential for coastal flooding. Based on the results, it is estimated that the risk of flooding to the Proposed Development will be minimal and will not increase the risk of flooding elsewhere. As such, the risk of contamination of surface waters exacerbated during a future climate scenario flood event is considered to be low given the proposed mitigation measures, refer to Section 7.7. Overall, flood events during the operational phase have the potential to have ‘neutral’, ‘imperceptible’, ‘permanent’, effects on water quality and hydrological receptors and is considered non-significant in the context of the EIA Directive.

### 7.6.3 Potential Cumulative Effects

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, offsite developments and proposed offsite developments, as detailed in Chapter 2 (Description of the Proposed Development) apter 2 of this EIAR, were reviewed and considered for possible cumulative effects with the Proposed Development.

#### *7.6.3.1 Water Resources*

As documented in the Civil Works Design Report (TOBIN, 2025), the proposed water supply for the Proposed Development will be made by connecting a 200mm diameter watermain to an existing 300mm diameter UÉ watermain, which is located running along the existing Lough Atalia Road, north of the proposed site entrance.

The UÉ COF confirmed that the connection to be feasible without infrastructure upgrade by Irish Water and there is also sufficient capacity for the Proposed Development. All watermain designs will be fully vetted by UÉ prior to receiving an offer to connect and will be operated in accordance with relevant existing statutory consents therefore there will be no cumulative impacts associated with the Proposed Development on the supply network and water resources.

#### 7.6.3.2 *Water Quality*

Removal and remediation of contaminated soils from the Proposed Development site will have a positive impact on the long-term groundwater and surface water quality in the Corrib Estuary and receiving waterbodies. Accordingly, it is considered that any cumulative impact on Water Quality associated with the Proposed Development will be ‘positive’, ’moderate’ and ‘long-term’.

Foul water from the Proposed Development will be discharged to the mains foul network for treatment at Galway WWTP. The UÉ COF confirmed the connection is feasible subject to upgrades, although it confirmed that there is sufficient capacity for the Proposed Development. The Applicant will fund all required upgrades to the satisfaction of UÉ. The Galway WWTP is

operated in accordance with relevant statutory approvals issued by UÉ. The increase in discharge to the Galway WWTP as a result of the Proposed Development is considered to be insignificant in terms of the overall scale of the facility. The increased load does not have the capacity to alter the effluent released from the WWTP to such an extent as to result in likely significant effects on its receiving waters. Foul water from the site will only be discharged to the UÉ network under the appropriate consents from UÉ and therefore, the Proposed Development will have no cumulative impacts individually or in-combination on the receiving water quality and WFD status.

### 7.6.4 "Do Nothing" Effect

In the "Do Nothing" Scenario, it is assumed that the Proposed Development does not proceed.

In the 'Do Nothing' scenario potential negative impacts during the construction phase in terms of introduction and mobilisation of contaminants in surface water and groundwater would be negated. However, the removal and reduction of contaminants that would be required as part of the Proposed Development would also not take place. As the site is zoned for development, in the absence of the Proposed Development, it is likely that a development of a similar nature is likely to be constructed in the future in line with national policy and the development plan objectives. Therefore, the construction and operational phase impacts outlined in this assessment are likely to occur in the future, even in the absence of the Proposed Development

## 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 Incorporated Design Mitigation

The excavation of Made Ground soils impacted with anthropogenic contamination and permanent removal off-site is a design requirement of the Proposed Development. As part of incorporated design measures for the Proposed Development in-situ soil validation samples will be collected to ensure that residual contamination in soil has been removed offsite.

In accordance with current UKWIR16 guidance, the design for the proposed development will include the use of barrier pipes for water supply in certain areas of the site to prevent potential permeation of contaminants into drinking water supplies.

The design and specification of the concrete will be undertaken by a suitably qualified engineer during the detailed design stage.

The site is located in the proximity to Galway Bay and the River Corrib, which is estuarine in nature, suggesting a heightened risk of coastal flooding. As documented in Stage 2 FRA (TOBIN, 2025), in order to protect the site against the 1 in 1000-year (0.1% AEP) MRFS flood event, which is required for critical infrastructure, the FFL (floor level) at the site is required to be at a minimum 5.05mOD to account for climate change and a freeboard of 300mm.

### 7.7.2 Construction Phase

During the construction phase, all works will be undertaken in accordance with the Construction Environmental Management Plan (CEMP) (DNV, 2025a), the Resource and Waste Management Plan (RWMP) (AWN, 2025). Following appointment, the contractor will be required to further develop the CEMP and the 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 CEMP 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:

- Control and management of contaminated soil.
- Control and management of surface water runoff.
- Control and management of water including potentially contaminated groundwater and management of dewatering activities.
- Piling.
- Borehole decommissioning.
- Control and handling of cementitious materials.
- Appropriate fuel and chemical handling, transport and storage.
- Management of accidental release of contaminants at the site.
- Flooding.
- Welfare facilities.

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.

#### *7.7.2.1 Control and Management of Contaminated Soil*

Contaminated soil will be encountered during groundworks at the site (refer to Chapter 6 of this EIAR for further details). It is anticipated that the majority of contaminated soils will be

excavated during bulk excavations for the Proposed Development. Nevertheless, as part of incorporated design measures for the Proposed Development, in-situ soil validation samples will be collected to ensure that residual contamination in soil has been removed offsite. The removal of the residual soil source will be undertaken under supervision of the Project Environmental Consultant and validated in accordance with relevant guidelines including EPA 'Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites' (EPA, 2013a) and guidance and standards current at the time of construction works to ensure that a 'clean edge' is reached in the area of excavation.

The removal of localised hotspots shall be undertaken prior to the bulk excavation works for the construction of building foundations, utility infrastructure and other works to reduce the potential risks associated with exposure of soils to rainfall or surface runoff and leaching to groundwater.

Where possible, stockpiling of soils and subsoils onsite will be avoided. However, in the event that stockpiling is required, stockpiled materials, pending reuse onsite, where required, will be located away from the location of any sensitive receptors (watercourses and drains). In accordance with Inland Fisheries Ireland guidelines, stockpiles will not be allowed within 50m of the open water where sufficient working areas are available within the site boundary.

Surplus material, not suitable for reuse, will be segregated, and stockpiled appropriately for removal offsite. For any excavated material identified for removal offsite, while assessment and approval of acceptance at a destination reuse, recovery site or waste facility is pending, excavated soil for recovery/disposal shall be stockpiled as follows:

- A suitable temporary storage area will be identified and designated.
- All stockpiles will be assigned a stockpile number.
- Stockpiled soil and stone materials will be protected from exposure to wind by storing the material in sheltered regions of the Proposed Development site.
- Soil waste categories will be individually segregated; and all segregation, storage & stockpiling locations will be clearly delineated on the site drawing.
- Any waste to be temporarily stockpiled will be stockpiled only on hard standing on heavy gauge polythene sheeting and soil stockpiles will be sealed to prevent run-off of rainwater and leaching of potential contaminants from the stockpiled material generation and/or the generation of dust.
- There will be no storage of materials within 10m of any boundary, drains and watercourses.

#### *7.7.2.2 Control and Management of Water and Surface Runoff*

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:

- Surface water from the surrounding areas will be prevented from draining into the open excavations onsite during construction works through the use of temporary bunds / sandbags around excavation areas to provide diversion of surface water away from excavations. A 10m buffer zone will be established around any open drainage courses and road gullies during construction works and other methods such as bunding

implemented where appropriate to ensure that all watercourses or drainage gullies are appropriately isolated

- Where surface water runoff must be pumped from the excavations, water will be managed in accordance with best practice standards (i.e., CIRIA C750), the CEMP (DNV, 2025a) and regulatory consents to minimise the potential impact on the local groundwater flow regime within the underlying aquifer and surface water bodies.
- Unauthorised discharge of water (groundwater / surface water runoff) to ground, drains or watercourses will not be permitted. The appointed Contractor will ensure that the discharge of water to ground, drains or watercourses will be in accordance with the necessary discharge licences issued by UÉ under Section 16 of the Local Government (Water Pollution) Acts and Regulations for any water discharges to sewer or from Galway City Council under Section 4 of the Local Government (Water Pollution) Act 1977, as amended in 1990 for discharges to surface water.
- The use of wheel wash and water treatment facilities will be used as required onsite. The correct use and management of these will be undertaken by the appointed contractor to ensure that there is no harm to the receiving water environment.
- Where required, stockpiles of loose materials pending reuse onsite (although unlikely) 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.
- Excavation works for piling caps; utility infrastructure and other works will be undertaken in a phased manner in order to minimise the exposure of soil to rainfall. Where feasible groundworks will be undertaken during dryer weather and avoided where heavy rainfall is forecast. Suitable temporary cover (e.g., tarpaulins) of potentially contaminated areas will be required to prevent ingress of rainfall.
- A regular review of weather forecasts of heavy rainfall will be conducted, in particular during groundworks, and a contingency plan will be prepared for before and after such events to minimise any potential nuisances. As the risk of the break-out of silt laden run-off is higher during these weather conditions, no work will be carried out during such periods where possible.
- Public roads outside the site will be regularly inspected for cleanliness, as a minimum on a daily basis, and cleaned as necessary. If required, a road sweeper will be deployed to ensure that public roads are kept free of debris to prevent any runoff entering road gullies and the receiving water environment.

#### *7.7.2.3 Control and Management of Groundwater*

Shallow groundwater may be encountered during excavations required to achieve the required formation levels for the site including building foundations, surface water and foul water drainage, roads and all other associated infrastructure. Groundwater control is likely to be achieved within shallow excavations within the Made Ground by adopting a sump and pump system around the perimeter of the excavation (MKO 2022).

The results of chemical testing indicate that shallow groundwater has been impacted by contamination in isolated locations. Where water must be pumped from the excavations, water will be managed through robust dewatering methodologies in accordance industry best practice standards (i.e., CIRIA – C750) that will be designed by the contractor to minimise the potential impact on the local groundwater flow regime.

- Dewatering will be carried out in cells or localised work areas and larger scale dewatering of the entire site will be avoided to prevent an extensive groundwater drawdown across the site and potential mobilisation of contaminants present in localised areas beneath the site and / or outside of the site boundary.
- The current groundwater flow regime shall not be altered to ensure any risk of increasing the distribution of contaminants within the groundwater beneath the site.
- Monitoring of groundwater levels and contaminant concentrations around the periphery of the works area will be required as part of the groundwater management.

There will be no authorised discharge of water to ground during the construction phase. Where dewatering of shallow groundwater is required or where surface water runoff must be pumped from the excavations, water will be discharged by the contractor to sewer in accordance with the necessary discharge licences issued by UÉ under Section 16 of the Local Government (Water Pollution) Acts and Regulations for any water discharges to sewer or from FCC under Section 4 of the Local Government (Water Pollution) Act 1977, as amended in 1990 for discharges to surface water.

To facilitate this, a temporary water treatment facility, including holding tanks and other necessary apparatus (such as activated carbon filtration and silt busters), will be constructed onsite. This facility will ensure compliance with the conditions of the temporary discharge consent. Water will be treated and pumped to a holding area, where it will be sampled and tested by the contractor before discharge. Upon receiving analysis results and screening against required consent limits, the contractor will arrange for appropriate disposal. Groundwater will be treated and discharged to sewer in accordance with the temporary discharge consent.

Under no circumstances will any untreated wastewater generated onsite (from equipment washing, road sweeping etc.) be released offsite. Where required, all public sewers will be protected to ensure that any untreated wastewater generated onsite does not enter the public sewers.

#### *7.7.2.4 Piling*

Given the presence of contamination (i.e., hydrocarbons, PAHs, heavy metals, cyanide) in soil and groundwater beneath the site, a piling risk assessment will be completed by the appointed Contractor at detailed design stage and in advance of construction works commencing onsite. The proposed piling methodology will refer to the Environment Agency's (EA) guidance on 'Piling into Contaminated Sites' (EA, 2002) and 'Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention' (EA, 2001), (or similar best practice) in order to minimise the potential for the introduction of any temporary conduit between any potential sources of contamination at the ground surface, made ground and underlying groundwater. The piling method will also include procedures to ensure any potential impact to water quality is prevented including preventing surface runoff or other piling/drilling fluids from entering the pile bores and surrounding formation. Where there is a

requirement to use lubricants, drilling fluids or additives the contractor will use water-based, biodegradable, and non-hazardous compounds under controlled conditions.

#### *7.7.2.5 Borehole Decommissioning*

Existing groundwater monitoring wells at the site that are no longer required will be decommissioned in advance of construction works commencing. This work will be undertaken prior to the bulk excavation works for the construction of building foundations, utility infrastructure and other works to remove any direct conduit or pathway from ground surface for any contaminants to enter groundwater beneath the site.

Prior to commencing the demolition works, all wells will be inspected. The proposed schedule of wells to be decommissioned will be identified by the appointed Contractor in advance of construction works commencing onsite.

Monitoring wells within the site to be retained during the construction phase of the Proposed Development will be protected to ensure that the well head is not damaged during works. Any required wells that will unavoidably be removed during construction works will be decommissioned and replaced with a new monitoring well.

Decommissioning of wells will be undertaken in strict accordance with current best-practice at the time of decommissioning and at a minimum the specifications outlined in EPA Advice Note 14 (EPA, 2013b). This will remove any potential direct conduit for contaminants to enter the groundwater directly and potentially migrate offsite.

Any wells to be retained will be appropriately protected from damage during construction works using precast concrete rings, steel road plates or permanent metal bollards to protect them from damage throughout the works. Clear legible signage will be maintained, and daily inspection of the integrity of wells and protection measures completed.

#### *7.7.2.6 Concrete Works*

The use of cementitious grout used 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 CEMP (DNV, 2025a), and relevant industry standards to prevent effect on groundwater and surface water quality such as the use of water compatible grout.

The following mitigation measures will be adhered to when using concrete for the Proposed Development:

- All ready-mixed concrete will be delivered to the site by truck.
- 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.

#### *7.7.2.7 Handling of Fuels, Chemicals and Materials*

Fuelling and lubrication of equipment will be carried out in accordance with the procedures outlined in the CEMP (DNV, 2025a), 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.

The storage and use of fuel and oils will be kept to a minimum at the site for the duration of the construction phase and will be strictly controlled in accordance with procedures outlined in the CEMP (DNV, 2025a). 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.

- Refuelling of plant during the construction phase will be carried out in accordance with standard best practice. Onsite refuelling will not be undertaken within 50m of any open drains in the vicinity of the site which will be protected / temporary diversion put in place (i.e., sandbags) in order to prevent contamination of nearby waterbodies such as the Corrib Estuary which is adjacent to the site and the River Corrib which is located approximately 230 meters to the west of the site.
- Onsite refuelling will only be carried out at the designated, impermeable refuelling station location onsite with appropriate containment in place. The refuelling station will be fully equipped for spill response and a specially trained and dedicated Environmental and Emergency Spill Response Team will be appointed before the commencement of works at the site.
- 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.
- 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.
- 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.

- Any fuels retained on drip trays, mobile bunds, etc., will be emptied into a secure bunded waste oil drum to await appropriate disposal offsite in accordance with all relevant waste management legislation.
- Heavy machinery used on the site will also be equipped with its own spill kit.
- 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.
- Suitable bunded areas will be installed for oil and petrol storage tanks.
- Designated fuel filling points will be put in place with appropriate oil and petrol interceptors to provide protection from accidental spills.
- Spill kits will be provided by the main contractor to cater for any other spills.
- Where contractors are required to refuel vehicles, this will only be carried out at the designated refuelling location within the site storage compound, which must employ pollution control mechanisms to prevent escape of fluids to the river. No refuelling is permitted on site (i.e. within or adjacent to any waterbodies, specifically the Corrib Estuary transitional waterbody and drainage ditches) due to risk of spillage.
- The local authority will be informed immediately of any spillage or pollution incident that may occur onsite during the construction phase.

#### *7.7.2.8 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.

#### *7.7.2.9 Infrastructure*

All below ground drainage infrastructure will be constructed in accordance with current UÉ requirements to ensure that there are no potential impacts to groundwater quality.

#### *7.7.2.10 Flooding*

The appointed Contractor will provide method statements for weather and tide/storm surge forecasting and continuous monitoring of water levels in the Corrib Estuary transitional waterbody. The appointed Contractor will also provide method statements for the removal of site materials, fuels, tools, vehicles, and persons from flood zones in order to minimise the risk to persons working on the site as well as potential input of sediment or construction materials into the waterbodies during flood events.

#### *7.7.2.11 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.

Any connection to the public foul drainage network during the construction phase of the Proposed Development will be undertaken in accordance with the necessary temporary discharge licences, to be issued by Uisce Éireann (UÉ).

### 7.7.3 Operational Phase

There will be no risk to water quality, including groundwater and surface water, associated with the operational phase of the Proposed Development. It is considered that the design of the Proposed Development is in line with the objectives of the Water Framework Directive (2000/60/EC), as amended (WFD) to prevent or limit any potential impact on water quality.

There will be no requirement for bulk storage of petroleum hydrocarbon-based fuels during the operational phase, as the main operating systems for heating proposed for the site will be either a communal (centralised) heat pump solution or an Exhaust Air Heat Pump (EAHP) solution, thereby removing any potential contaminant sources associated with fuels. Further details are provided in Chapter 13 of this EIAR.

There will be no discharges to ground from drainage and only rainfall on public / communal open spaces will infiltrate to ground.

All drainage from paved areas along roads and impermeable roads will be collected and managed within the surface water drainage and SuDS solutions as outlined in the Civil Works Design Report (TOBIN, 2025).

The surface water management strategy includes a number of measures that will capture any potentially contaminating compounds (hydrocarbons, metals, and suspended sediments) in

surface water runoff from the higher risk areas, including roads and the impermeable areas that could potentially otherwise discharge to groundwater or receiving water courses in the vicinity of the site. The measures incorporated in the SuDS design include a combination of water butts, rain gardens, swales, tree pits, permeable paving, and drainage kerbs with infiltration trenches/filter strips. The SuDS measures implemented will be effective in the treatment and removal of any contaminants (metals, hydrocarbons and suspended solids) entrained in surface water runoff. The effectiveness of these SuDS measures is documented in TII guidance (TII, 2014). Furthermore, prior to discharging from the site will pass through a Bypass Separator that will be effective in removal of hydrocarbons that may enter the drainage system in particular in the event of worst-case scenario spill incident (e.g., collision on the roadway resulting in the loss of fuel from a vehicle).

Ongoing regular operational monitoring and maintenance of drainage and the SuDS measures will be incorporated into the overall management strategy for the Proposed Development. This will ensure that there are no impacts on water quality and quantity (flow regime) during the operational phase of the Proposed Development.

Accordingly, any potential impact on receiving surface water and groundwater beneath the Proposed Development site will be avoided taking account of the design proposals. Therefore, it is considered that the water quality protection criteria and objectives of the GDSDS 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. The WFD report is included in the EIAR Volume 3: Appendix 7.1.

### 7.8.1 Waterbody Status

The risk-based assessment focused on the following waterbodies that have a potential hydraulic connection to the site:

- Clarinbridge GWB
- Corrib Estuary Transitional Waterbody
- Inner Galway Bay North Coastal Waterbody

- Inner Galway Bay South Coastal Waterbody
- Outer Galway Bay Coastal Waterbody

There is no identified potential impact to other 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.

### 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 Clarinbridge GWB, the Corrib Estuary Transitional Waterbody and associated downstream Coastal Waterbodies. 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, 2025)

The design avoidance and mitigation measures as outlined above, the remedial excavations of residual contaminated soil, the implementation of a robust CEMP during the construction phase and the incorporation of SuDS in the design of the Proposed Development, will serve to mitigate 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, European Communities (Environmental Objectives) Surface Water Regulations, 2009 (SI 272 of 2009, as amended 2012 (SI No 327 of 2012), and the European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010), as amended 2012 (SI 149 of 2012) and 2016 (S.I. No. 366 of 2016).

### 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 the Corrib Estuary Transitional Waterbody, associated Coastal Waterbodies and the Clarinbridge 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

The potential accidental release of hazardous material including fuels, waste materials being used on-site, contaminated soil and groundwater removed during groundworks, creation of pathways for contaminants to enter underlying groundwater during piling and any associated impact on the receiving hydrological and hydrogeological environment would only occur

through the failure of secondary containment or a major incident on the site. A major failure in municipal flood defences during the construction phase of the Proposed Development may also potentially create pathways for contaminants to enter adjacent waterbodies.

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 Effects

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 7-14 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 water bodies associated with the Proposed Development including the Corrib Estuary Transitional Waterbody, associated Coastal Waterbody and the Clarinbridge GWB as a result of the Proposed Development taking account of design avoidance and mitigation measures where required.

The permanent removal of residual contaminated soil will result in source removal and an overall site betterment and an overall positive effect on receiving water quality.

*Table 7-14 Summary of Potential Impacts*

| Activity | Attribute | Predicted Impact | Quality | Significance (Significance in the Context of the EIA Directive) | Duration | Type | Mitigation | Residual Impact (Significance in the Context of the EIA Directive) |
|---|---|---|---|---|---|---|---|---|
| **Construction Phase** | | | | | | | | |
| Excavation of Soil and Subsoil | Groundwater Quality and WFD status | The excavation of made ground and impacted with anthropogenic contamination (i.e., residual contamination in soil) and permanent removal offsite is a design requirement of the Proposed Development. | Positive | Moderate (Significant) | Long-term | Direct Cumulative | As part of incorporated design measures for the Proposed Development in-situ soil validation samples will be collected to ensure that residual contamination in soil has been removed offsite. | Positive (Significant) |
| Contaminant Mobilisation | Groundwater and Receiving Surface Water Quality and WFD status | Surface runoff entering the open excavations could result in mobilisation of identified hydrocarbon and other residual contamination in soil and leaching and migration to groundwater beneath the site. In addition, if existing monitoring wells are inadvertently damaged there could be a potential for migration of surface runoff or other sources to migrated directly to groundwater. | Negative | Moderate to Significant (Significant) | Medium-term | Direct / Worst-case | Surface water from the surrounding areas will be prevented from draining into the open excavations onsite during construction works through the use of temporary bunds / sandbags around excavation areas to provide diversion of surface water away from excavations. In addition, existing groundwater | Imperceptible (Non-significant) |

| Activity | Attribute | Predicted Impact | Quality | Significance (Significance in the Context of the EIA Directive) | Duration | Type | Mitigation | Residual Impact (Significance in the Context of the EIA Directive) |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | monitoring wells at the site that are no longer required will be decommissioned in line with referenced guidance in advance of construction works commencing | |
| Contaminant Mobilisation | Groundwater and Receiving Surface Water Quality and WFD status | Dewatering required including the pumping of groundwater, where encountered in excavations, could alter the local groundwater flow regime and contaminant distribution within the subsurface. | Negative | Moderate to Significant (Significant) | Medium-term | Direct / Worst-case | Where surface water runoff must be pumped from the excavations, water will be managed in accordance with best practice standards (i.e., CIRIA C750), the CEMP (DNV, 2025a) and regulatory consents to minimise the potential impact on the local groundwater flow regime within the underlying aquifer and surface water bodies | Imperceptible (Non-significant) |
| Potential uncontrolled release of hazardous materials | Groundwater and Receiving Surface Water Quality and WFD status | Potential (albeit low) for uncontrolled release of deleterious materials including fuels and other materials being used onsite, | Negative | Significant (Significant) | Medium-term | Direct / Worst-case | Refuelling of plant and storage of any deleterious materials including fuels will be undertaken in | Imperceptible (Non-significant) |

| Activity | Attribute | Predicted Impact | Quality | Significance (Significance in the Context of the EIA Directive) | Duration | Type | Mitigation | Residual Impact (Significance in the Context of the EIA Directive) |
|---|---|---|---|---|---|---|---|---|
| including fuels, oils and other materials | | through the failure of secondary and tertiary containment or materials handling accident, to the receiving groundwater environment. | | | | | accordance with the requirements and procedures outlined in the CEMP. Furthermore, the use of cementitious grout used 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 CEMP (DNV, 2025a), and relevant industry standards | |
| Surface Runoff Containing Contaminants or Suspended Solids. | Surface Water Quality | Potential for contaminants entrained in surface runoff to enter the receiving waterbodies (i.e., Corrib Estuary and associated waterbodies). | Negative | Slight to Moderate (Significant) | Short-term | Direct / Indirect | Site works will be managed to prevent runoff migrating offsite. The appointed contractor will ensure that any runoff from the site will be managed for the | Imperceptible (Non-significant) |

| Activity | Attribute | Predicted Impact | Quality | Significance (Significance in the Context of the EIA Directive) | Duration | Type | Mitigation | Residual Impact (Significance in the Context of the EIA Directive) |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | duration of the construction phase to ensure that surface water runoff is contained, attenuated and treated onsite prior to discharge to surface water / groundwater | |
| Creation of Preferential Pathways During Piling | Groundwater and Receiving Surface Water Quality and WFD status | Piling could introduce a potential conduit to groundwater for any contaminants used during construction and depending on the piling method, materials used in piling such as grout and other materials. | Negative | Significant (Significant) | Medium-term | Direct / Worst-case | A piling risk assessment will be completed by the appointed Contractor at detailed design stage and in advance of construction works commencing onsite. | Imperceptible (Non-significant) |
| Mobilised Pollutants from Construction Materials as a Result of Flooding | Groundwater and Receiving Surface Water Quality and WFD status | During a flood event there is the potential for pollutants derived from construction materials to be mobilised by flood waters. | Negative | Moderate (Significant) | Temporary | Direct | The Contractor will provide method statements for the removal of site materials, fuels, tools, vehicles, and persons from flood zones. | Imperceptible (Non-significant) |
| Release of Foul Water During Connection to Live Sewers | Groundwater and Receiving Surface Water Quality and WFD status | The release of foul water during connection to the live sewers could result in a release of contaminants to ground or as overland runoff. | Negative | Moderate (Significant) | Short-term | Direct | Foul water drainage infrastructure will be designed and constructed in accordance with current guidelines and the measures | Imperceptible (Non-significant) |

| Activity | Attribute | Predicted Impact | Quality | Significance (Significance in the Context of the EIA Directive) | Duration | Type | Mitigation | Residual Impact (Significance in the Context of the EIA Directive) |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | outlined in the CEMP and current UE requirements. Procedures will be in place for the connection to prevent any accidental release during works. | |
| **Operational Phase** | | | | | | | | |
| There will be no direct or indirect impact on the receiving hydrological and hydrogeological environment associated with the operational phase of the Proposed Development. | | | | | | | | |

## 7.10 Monitoring

### 7.10.1 Construction Phase

During the construction phase of the Proposed Development the following monitoring measures will be implemented:

- The removal of the residual soil source will be validated by the Project Environmental Consultant in accordance with relevant guidelines including EPA 'Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites' (EPA, 2013a) and guidance and standards current at the time of construction works.
- Groundwater and surface water monitoring will be undertaken by the Project Environmental Consultant during the construction phase of the Proposed Development. A period of monitoring will also be undertaken post completion of the construction phase. The programme of monitoring will be agreed with the local authority in advance of construction works commencing onsite.
- Inspections will be undertaken during excavations and other groundworks to ensure that measures that are protective of water quality outlined in this EIAR, and the CEMP (DNV, 2025a), are fully implemented and effective.
- A piling risk assessment will be completed by the appointed Contractor at the detailed design stage and in advance of construction works commencing onsite. Monitoring during the construction phase will be undertaken in accordance with the pilling risk assessment.
- The decommissioning of boreholes onsite will be supervised by the Project Environmental Consultant to ensure it is completed in accordance with industry best practice standards including the Environmental Protection Agency's (EPA) advice note on "Borehole Construction and Wellhead Protection" (EA, 2013).
- All surface water control measures including silt traps, silt fences and settlement ponds will be checked regularly and maintained as necessary, in order to ensure continued effectiveness throughout the construction phase.
- During dewatering works, monitoring of groundwater levels and contaminant concentrations around the periphery of the works area will be required as part of the groundwater management.
- Discharges to sewer will be monitored, where required, in accordance with statutory consents (i.e., discharge licence). Where required, water pumped from excavations will be treated and pumped to a holding area, where it will be sampled and tested by the contractor before discharge. Upon receiving analysis results and screening against required consent limits, the contractor will arrange for appropriate disposal. Groundwater will be treated and discharged to the foul sewer in accordance with the temporary discharge consent.
- Routine monitoring and inspections will be undertaken during refuelling and concrete works to ensure that there are no impacts arising from those works and to ensure compliance with avoidance, remedial and mitigation measures.

### 7.10.2 Operational Phase

Ongoing regular operational monitoring and maintenance of drainage and the SuDS measures will be undertaken throughout the lifetime of the operational phase of the Proposed Development.

## 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, Section 4.6 of this EIAR.

The soils and groundwater beneath the site are locally impacted with hydrocarbons, PAHs and some metals. Without suitable remedial measures, the contamination under the Proposed Development site (i.e., presence of hydrocarbons in the made ground) poses a risk to structures, site workers and future occupants of the site from inhalation, dermal contact, etc.

In accordance with current UKWIR16 guidance, the design for the Proposed Development will include the use of barrier pipes for water supply in certain areas of the site to prevent potential permeation of contaminants into drinking water supplies and ensure that there is no risk to future occupants.

Appropriate industry standard and health and safety legislative requirements will be implemented during the construction phase of the Proposed Development that will be protective of site workers.

### 7.11.2 Land and Soils

An assessment of the potential impact of the Proposed Development on the land and soils is included in Chapter 6, Section 6.6 of this EIAR. During the construction of earthworks, heavy rainfall events have the potential to mobilise contaminated runoff and impact on the usability of materials stored onsite. This could therefore require the importation of additional material from external sources. Mitigation measures to reduce the risk of damage to construction materials from heavy rainfall and flood events are outlined in this Chapter of the EIAR.

### 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 as a result of the excavation and importation of materials to the site, is included in Chapter 5, Section 5.5 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 Material Assets

An assessment of the potential impact of the Proposed Development on the material assets - waste and utilities including built services and infrastructure has been set out in Chapter 13, Section 13.5 of this EIAR.

During the construction phase of the Proposed Development, discharges of water to the public foul sewer will be in accordance with the necessary discharge licence issued by UÉ under Section 16 of the Local Government (Water Pollution) Acts and Regulations.

During the operational phase of the Proposed Development, any discharges to the public foul sewer and water supply to the Proposed Development will be under consent from UÉ.

## 7.12 Difficulties Encountered When Compiling

There were no difficulties encountered in the preparation of this chapter of the EIAR.

## 7.13 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 Corrib_020 River, the Corrib Estuary Transitional Waterbody, the Inner Galway Bay North Coastal Waterbody, the Inner Galway Bay South Coastal Waterbody and the Chainbridge GWB as a result of the Proposed Development taking account of design avoidance and mitigation measures where required.

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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 Laura Griffin, Environmental Consultant at DNV. Laura has a Master of Science (Hons) degree in Climate Change from Maynooth University and a Bachelor of Arts (Hons) degree in English and Geography from Maynooth University. Laura has 5+ years of professional experience. Laura has experience preparing Environmental Impact Assessment (EIA) Screening Reports and Environmental Impact Assessment Report (EIAR) chapters for developments of a similar scale and nature to the Proposed Development.

This chapter has been reviewed by Rachel Redmond, Environmental Consultant with DNV. Rachel has a Bachelor of Science (Hons) in Environmental Science from University College Cork. Rachel has over 3 years of experience as an environmental consultant preparing Environmental Impact Assessment Reports of a similar scale and nature to the Proposed Development.

This chapter was reviewed by Grainne Ryan, Principal EIA Consultant at DNV. Gráinne is an Environmental Consultant with over 11 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.

## 8.2 Study Methodology

The study methodology used is in line with accepted practices. Taking into account Ambient Air Quality Standards Regulations 2022 (S.I. No. 739/2022), the baseline air quality of the site is examined using Environmental Protection Agency (EPA) monitoring data. Air quality effects from the Proposed Development are then determined by a qualitative assessment of the nature and scale of dust and emission generating activities associated with the construction phase of the Proposed Development in accordance with relevant guidance (Institute of Air Quality Management (IAQM) 2024).

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; 2024). The European Commission (EC) Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the *'Habitats Directive'*) requires an

Appropriate Assessment (AA) to be carried out where there is likely to be a significant effect upon a European protected site. TII requires the Air Quality Specialist to liaise with an ecologist on schemes where there is a European protected site within 2km of the site. The following internationally designated sites are within 2km of the Proposed Development:

- Galway Bay Complex Special Area of Conservation (SAC) (000268);
- Inner Galway Bay Special Protection Area (SPA) (004031); and
- Lough Corrib SAC (000297).

This study involved coordination with the ecologist preparing Chapter 5 (Biodiversity) and Natura Impact Statement (NIS) 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 AA Screening/NIS, where potential impacts to the nearest Natura 2000 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:

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government (DHPLG), 2018);
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);
- 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);
- A Guide To The Assessment Of Air Quality Impacts On Designated Nature Conservation Sites (Version 1.1) (IAQM, 2020);
- TII Guidance Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106 and TII Road Emissions Model (REM) online calculator tool (TII, 2022); and
- TII Road Emissions Model (REM): Model Development Report – GE-ENV-01107 (TII, 2024).

#### *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, 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 ($NO_2$), particulate matter less than 10 microns ($PM_{10}$), and particulate matter less than 2.5 microns ($PM_{2.5}$) are considered the most relevant to this assessment. Directive 2008/50/EC also sets ambient air quality limit values for other pollutants including sulphur dioxide ($SO_2$), carbon monoxide (CO), and benzene. While these pollutants are not considered significant in the context of this proposed development, where traffic-related emissions such as $NO_2$ and PM are more relevant, they are acknowledged for completeness and regulatory requirement.

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 $SO_2$, nitrogen oxides ($NO_x$), volatile organic compounds (VOCs), ammonia ($NH_3$) 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 $NO_2$, $PM_{10}$, and $PM_{2.5}$, $SO_2$, 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 | Annual average limit for nuisance dust | 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$^3$ |

[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

| Pollutant | Regulation[1] | Limit Type | Value |
|---|---|---|---|
| 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/m³ $PM_{10}$ |
| | | Annual limit for protection of human health | 40 µg/m³ $PM_{10}$ |
| Particulate Matter (as $PM_{2.5}$) – Stage 1 | 2008/50/EC | Annual limit for protection of human health | 25 µg/m³ $PM_{2.5}$ |
| Particulate Matter (as $PM_{2.5}$) – Stage 2[2] | 2008/50/EC | Annual limit for protection of human health | 20 µg/m³ $PM_{2.5}$ |
| Sulphur Dioxide ($SO_2$) | 2008/50/EC | Hourly limit for the protection of human health (not to be exceeded >24 times/year) | 350 µg/m³ |
| | | Daily limit for protection of human health (not to be exceeded >3 times/year) | 125 µg/m³ |
| Carbon Monoxide (CO) | 2008/50/EC | Maximum daily 8-hour mean | 10 mg/m³ |
| Benzene | 2008/50/EC | Annual limit for protection of human health | 5 µg/m³ |

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 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.

[2] Stage 2 Indicative limit value for $PM_{2.5}$ to be applied from 1 January 2020 after review by the European Commission

At present, the applicable standards for assessing compliance in relation to air quality are those outlined in Table 8-1.

#### *8.2.1.2 Air Quality and Traffic Impact Significance Criteria*

The TII document *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022) 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, 2022) and reproduced in Table 8-2. These criteria have been adopted for the Proposed Development to predict the effect of $NO_2$, $PM_{10}$ and $PM_{2.5}$ emissions as a result of the Proposed Development.

*Table 8-2 Dust Emission Magnitude for the site*

| 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 |
| 95%-102% 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, 2022)

### 8.2.2 Construction Phase

#### *8.2.2.1 Construction Dust Impact Assessment*

The main air quality impacts that may arise during demolition and construction activities are:

- Dust deposition, resulting in the soiling of surfaces;
- Visible dust plumes, which are evidence of dust emissions;
- Elevated $PM_{10}$, $PM_{2.5}$ concentrations from demolition and construction activities (including earthworks and trackout); and
- An increase in concentrations of $PM_{10}$, $PM_{2.5}$ and nitrogen dioxide due to exhaust emissions from vehicles and equipment used on site (non-road mobile machinery) and vehicles accessing the site.

The risk of dust emissions from a demolition/construction site causing loss of amenity and/or health or ecological impacts (and effects) is related to:

- The activities being undertaken (demolition, number of vehicles and plant etc.);

- The duration of these activities;
- The size of the site;
- The meteorological conditions (wind speed, direction and rainfall);
- The proximity of receptors to the activities;
- The adequacy of the mitigation measures applied to reduce or eliminate dust; and
- The sensitivity of the receptors to dust.

The synoptic meteorological station at Athenry, Co. Galway is located approximately 17.3km east 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. This is due to the relatively short distance between the two locations and the broadly comparable inland conditions. While Athenry is not a coastal station, its proximity to Galway City and the absence of significant topographical variation between the two areas suggest that large differences in prevailing weather patterns are unlikely. Athenry also provides long-term, high-quality meteorological data, making it a suitable proxy for characterising site-specific climate conditions.

A review of Athenry meteorological data indicates that the prevailing wind direction is south-westerly, and wind speeds are generally moderate in nature (see Section 8.3.3.2). Moderate to high windspeeds (above 5m/s (7-10 knots)) are most likely to result in fugitive dust emissions. Approximately 48.29% of all hourly data featured winds of below 5m/s. In addition, dust generation is considered negligible on days where rainfall is greater than 0.2mm. According to a review of daily rainfall data from 2011-2024 it can be determined that 67% of the time dust generation will be reduced. The prevailing meteorological conditions in the vicinity of the site are favourable in general for the suppression of dust.

The 2011–2024 dataset was selected to ensure full calendar years were included in the analysis and to maintain consistency with the wind rose and rainfall assessments. While more recent data is available, it was not used as 2025 is incomplete, noting the timing of this assessment being undertaken in August 2025, and would, therefore, not provide a consistent long-term baseline.

As with any impact, the risk will be determined by the magnitude of the source, the effectiveness of the pathway and the sensitivity of the receptor.

The IAQM Guidance on the Assessment of Dust from Demolition and Construction (2024) provides a framework for the assessment of risk.

Activities on construction sites have been divided into four types:

- Demolition;
- Earthworks;
- Construction; and
- Trackout.

The potential for dust emissions is assessed for each activity that is likely to take place.

The assessment methodology considers three separate dust impacts (and effects):

- Annoyance due to dust soiling;
- The risk of health impacts due to an increase in exposure to $PM_{10}$; and
- Harm to ecological receptors with account being taken of the sensitivity of the area that may experience these effects.

The assessment is used to define appropriate mitigation measures to ensure that there will be no significant effect. Figure 8-1 presents the steps to perform a dust assessment (IAQM, 2024).

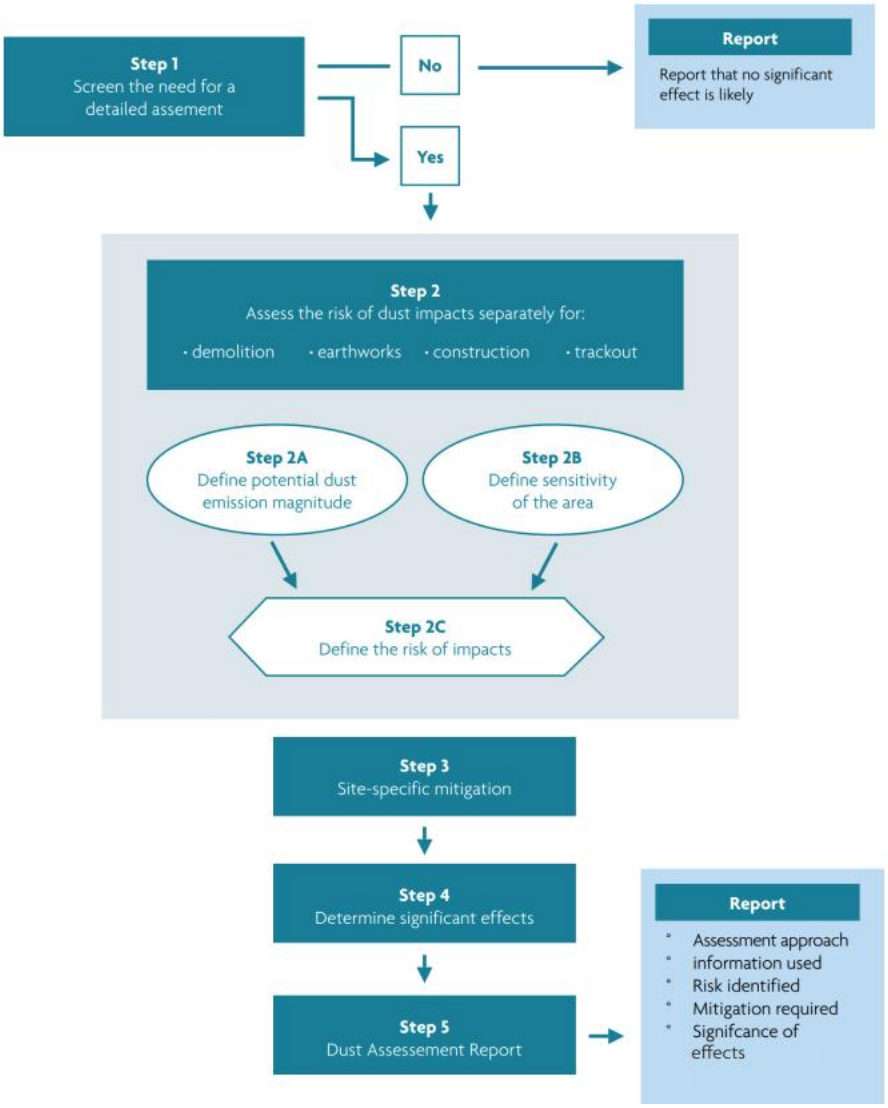



*Figure 8-1 Steps to Perform a Dust Assessment (IAQM, 2024)*

**Step 1 - Screening the Need for a Detailed Assessment**

Step 1 is to screen the requirement for a more detailed assessment. An assessment will normally be required where there is:

- A human receptor within:
  - 250m of the boundary of the site; and/or

  - 50m of the route(s) used by the construction vehicles on the public highway, up to 250m from the site entrance(s).
- An 'ecological receptor' within:
  - 50m of the boundary of the site; and/or
  - 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the site entrance(s).

A human receptor refers to any location where a person or property may experience the adverse effects of airborne dust or dust-soiling, or exposure to particulate matter ($PM_{10}$) over a period relevant to air quality objectives. An ecological receptor refers to any sensitive habitat that may be affected by dust deposition, including designated sites such as SACs, SPAs, and Sites of Special Scientific Interest (SSSIs).

The screening distances of 50 m and 250 m are based on IAQM guidance and reflect the typical range within which construction dust may cause impacts, depending on site activity and meteorological conditions.

There are a number of human receptors within 250m of the site boundary, including:

- The Harbour Hotel Galway, located on New Docks Road; and
- Residential dwellings along Dock Road, Lough Atalia Road and College Road.

The presence of these receptors within the screening zone necessitates a detailed assessment of potential air quality impacts during the construction phase.

The Galway Bay Complex SAC and Inner Galway Bay SPA adjoin the Proposed Development site, while Lough Corrib SAC is located downstream of the Proposed Development site, therefore, the requirement for a more detailed assessment has been screened in.

Figures 8-2 – 8-5 show the buffers of 20m, 50m, 100m and 250m from the Proposed Development site boundary, respectively.

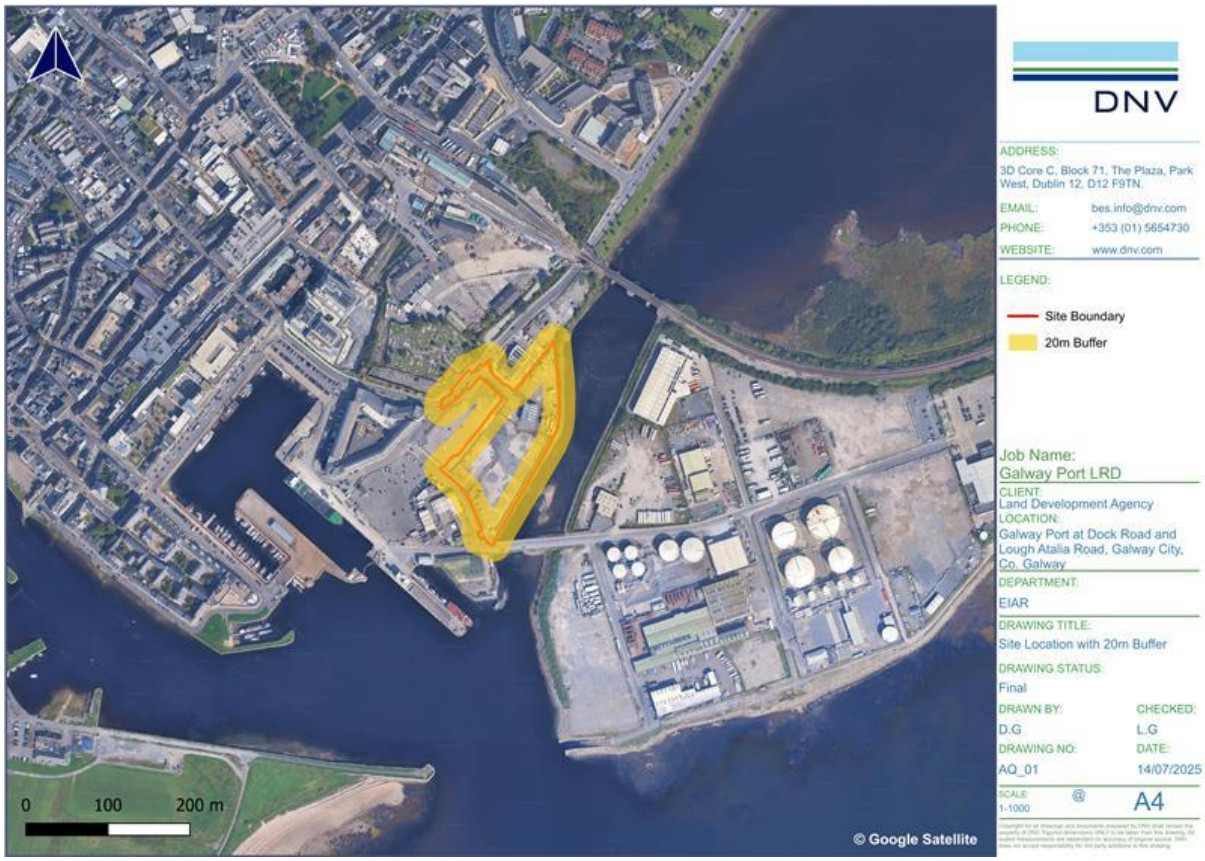



*Figure 8-2 Map Showing 20m Buffer from Site Boundary*

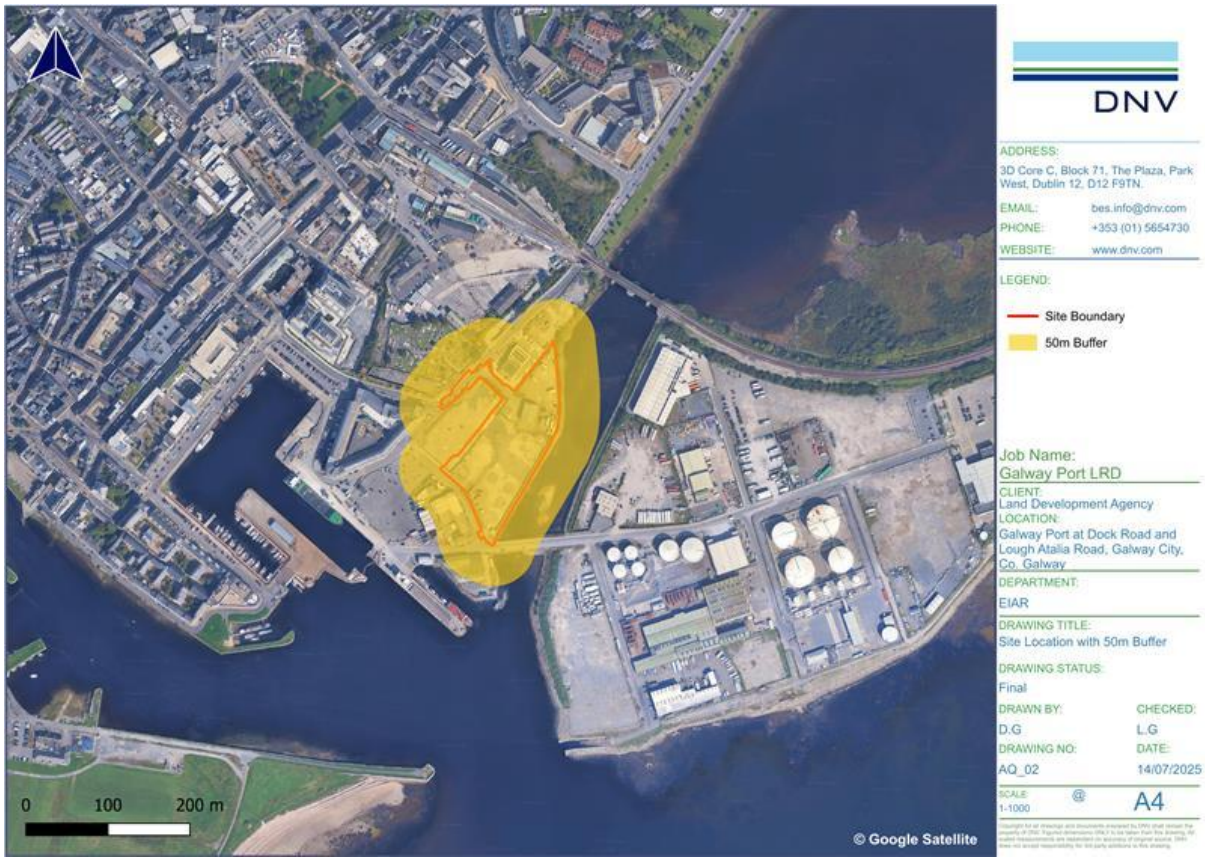



*Figure 8-3 Map Showing 50m Buffer from Site Boundary*

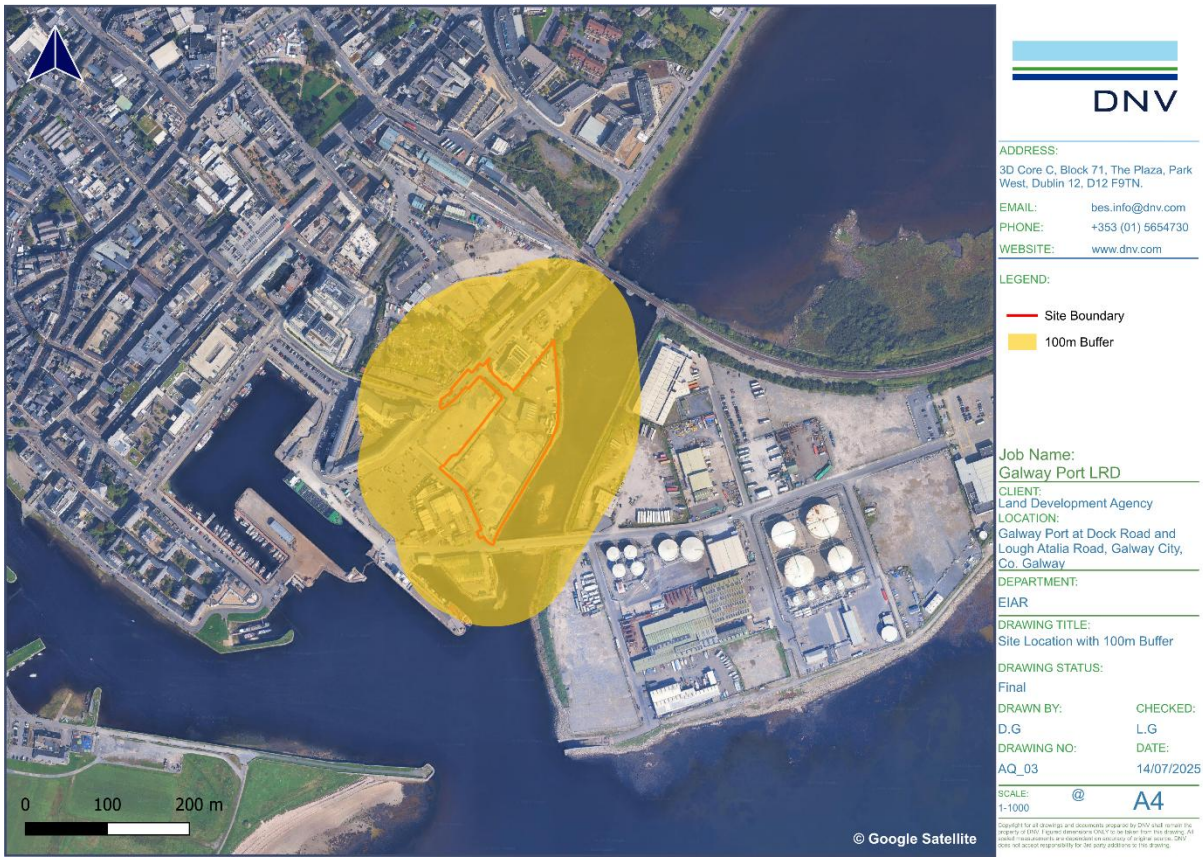



*Figure 8-4 Map Showing 100m Buffer from Site Boundary*

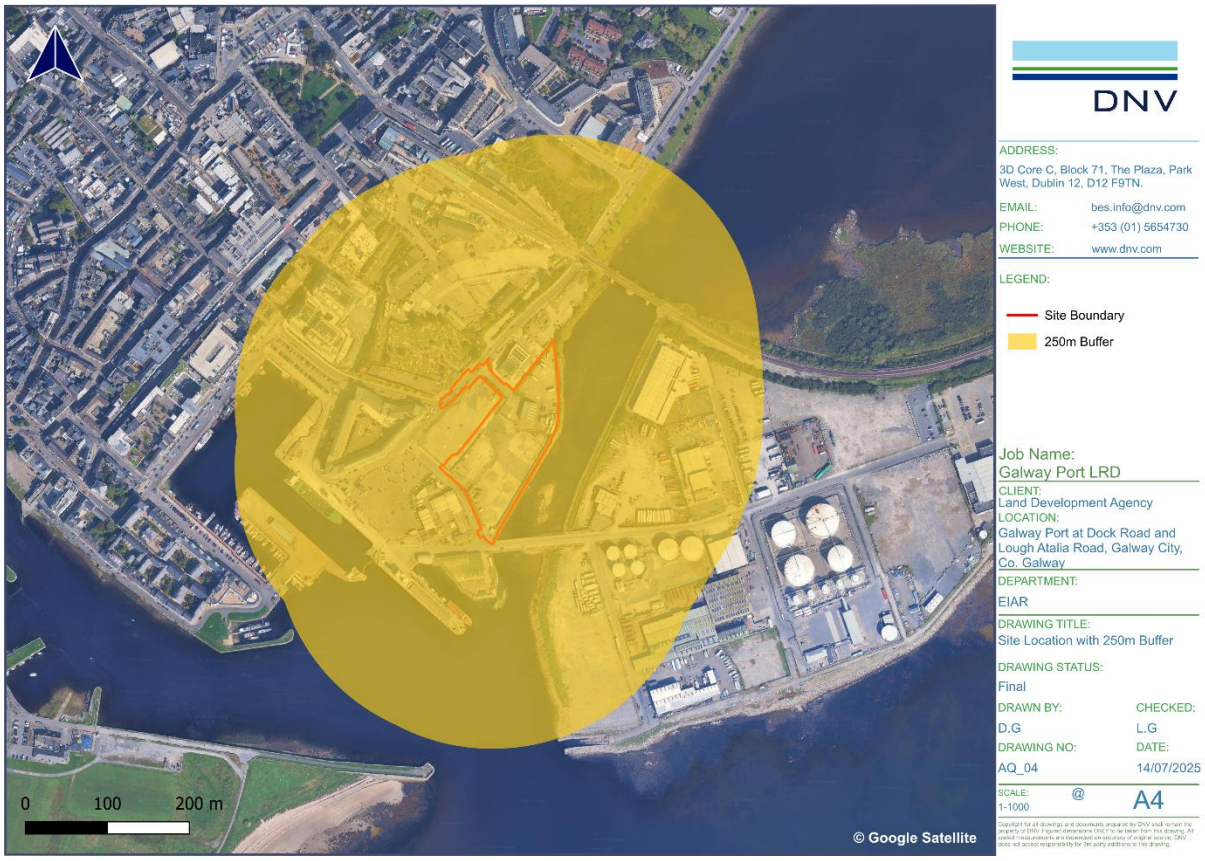



*Figure 8-5 Map Showing 250m Buffer from Site Boundary*

**Step 2 - Assess the Risk of Dust Impacts**

Step 2 is to assess the risk of dust impacts. This is carried out separately for each of the four activities (demolition, earthworks, construction, and trackout). According to the IAQM (2024), the risk of dust arising in sufficient quantities to cause annoyance and/or ecological impacts should be determined using four risk categories: negligible, low, medium and high. A site is allocated to a risk category based on two factors:

- The scale and nature of the works, which determines the potential dust emission magnitude as small, medium and large (Step 2A); and
- The sensitivity of the area to dust impacts (Step 2B), which is defined as low, medium or high sensitivity.

These two factors are combined in Step 2C to determine the risk of dust impacts with no mitigation applied. The risk category assigned to the site can be different for each of the four potential activities (demolition, earthworks, construction and trackout). More than one of these activities may occur on a site at any one time. Risks are described in terms of there being a low, medium and high risk of dust impacts for each of the four separate potential activities. Where there are low, medium and high risks of an impact, then site-specific mitigation will be required, proportionate to the level of risk.

**Step 2A – Define the Potential Dust Emission Magnitude**

The dust emission magnitude is based on the scale of the anticipated works and should be classified as Small, Medium or Large.

Demolition: Definitions for demolition as follows:

- Large: Total building volume >75,000m$^3$, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >12m above ground level;
- Medium: Total building volume 12,000m$^3$ – 75,000m$^3$, potentially dusty construction material, demolition activities 6-12m above ground level; and
- Small: Total building volume 12,000m$^3$, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <6m above ground, demolition during wetter months.

The total volume of building to be demolished is 1,390.8m$^3$ and therefore, the dust emission magnitude for demolition is defined as small.

Earthworks: Earthworks will primarily involve excavating material, haulage, topping and stockpiling. Activities such as levelling the site and landscaping works are also considered under this category. The dust emission magnitude from earthworks can be classified as small, medium and large based on the definitions from the IAQM guidance:

- Large: Total site area >110,000m$^2$, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >6m in height;
- Medium: Total site area 18,000m$^2$ – 110,000m$^2$, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 3m – 6m in height; and
- Small: Total site area <18,000m$^2$, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds >3m in height.

The dust emission magnitude for the proposed earthwork activities can be classified as small as the total site area is 16,210m$^2$. However, to account for a worst-case scenario, the dust emission magnitude for the proposed earthwork activities has been classified as medium.

Construction: The key issues when determining the potential dust emission magnitude during the construction phase include the size of the building(s)/infrastructure, method of construction, construction materials, and duration of build. The IAQM example definitions for construction are:

- Large: Total building volume >75,000m$^3$, on site concrete batching, sandblasting;
- Medium: Total building volume 12,000m$^3$ – 75,000m$^3$, potentially dusty construction material (e.g. concrete), on site concrete batching; and
- Small: Total building volume <12,000m$^3$, construction material with low potential for dust release (e.g. metal cladding or timber).

The total building volume to be constructed is 98,695m$^3$ therefore, the dust emissions magnitude for construction is large.

Trackout: Factors which determine the dust emission magnitude are vehicle size, vehicle speed, vehicle numbers, geology and duration. As with all other potential sources, professional judgement must be applied when classifying trackout into one of the dust emission magnitude categories. IAQM definitions for trackout are:

- Large: >50 HDV (>3.5t) outward movements[3] in any one day[4], potentially dusty surface material (e.g. high clay content), unpaved road length >100m;
- Medium: 20-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50m – 100m; and
- Small: <20 HDV (3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50m.

These numbers are for heavy duty vehicles (HDV) that leave the site after moving over unpaved ground, where they will accumulate mud and dirt that can be tracked out onto the public highway.

The dust emission magnitude for the proposed trackout activities can be classified as medium as there will be no more than 50 outward HDV movements in any one day. This figure was provided by the project's traffic consultant (NRB Consulting Engineers) and reflects the anticipated peak daily volume of heavy-duty vehicle movements associated with construction activities.

Table 8-3 provides a summary of the dust emission magnitude for the site.

*Table 8-3 Dust Emission Magnitude for the site*

| Activity | Dust Emission Magnitude |
|---|---|
| Demolition | Small |
| Earthworks | Medium |
| Construction | Large |
| Trackout | Medium |

**Step 2B – Define the Sensitivity of the Area**

The sensitivity of the area takes account of a number of factors:

- The specific sensitivities of receptors in the area;
- The proximity and number of those receptors;
- In the case of $PM_{10}$, the local background concentration; and
- Site-specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of wind-blown dust.

[3] A vehicle movement is a one-way journey i.e., from A to B, and excludes the return journey.

[4] HDV movements during the construction project vary over its lifetime, and the number of movements is the maximum, not the average.

### 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 8-4.

*Table 8-4 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<br>• The appearance, aesthetics or value of their property would be diminished by soiling; and<br>• 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;<br>• Museums and other culturally important collections; and<br>• Medium and long term car parks and show rooms. |
| Medium | • Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or<br>• The appearance, aesthetics or value of their property could be diminished by soiling; or<br>• 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. | • Parks; and<br>• Places of work. |
| Low | • The enjoyment of amenity would not reasonably be expected; or<br>• Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or<br>• 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;<br>• Farmland (unless commercially sensitive horticultural);<br>• Footpaths;<br>• Short-term carparks[5]; and<br>• Places of work. |

[5] 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.

### Sensitivities of People to Health Effects of $PM_{10}$

For the sensitivity of people to the health effects of $PM_{10}$, the IAQM (2024) recommends that the air quality practitioner assumes that there are three sensitivities based on whether or not the receptor is likely to be exposed to elevated concentrations over a 24-hour period, consistent with the Defra's advice for local air quality management, Defra LAQM Technical Guidance LAWM.TG (2022). Table 8-5 shows the sensitivities of people to the health effects of $PM_{10}$.

*Table 8-5 Sensitivities of People to the Health Effects of $PM_{10}$ (Source: IAQM, 2024)*

| Sensitivity | Features | Indicative Examples |
|---|---|---|
| High | • Locations where members of the public are exposed over a time period relevant to the air quality objective for $PM_{10}$ (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day)[6]. | • Residential properties;<br>• Hospitals;<br>• Schools; and<br>• Residential care homes. |
| Medium | • Locations where the people exposed are workers[7], and exposure is over a time period relevant to the air quality objective for $PM_{10}$ (in the case of 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). | • Office and shop owners.<br>(Workers occupationally exposed to $PM_{10}$ are generally not included as protection is covered by Health and Safety at Work Legislation) |
| Low | • Locations where human exposure is transient[8]. | • Public footpaths;<br>• Playing fields; and<br>• Shopping streets. |

### Sensitivities of Receptors to Ecological Effects

Dust deposition due to demolition, earthworks, construction and trackout has the potential to affect sensitive habitats and plant communities.

Dust can have two types of effect on vegetation: physical and chemical. Direct physical effects include reduced photosynthesis, respiration and transpiration through smothering. Chemical

[6] This follows Defra guidance as set out in LAQM.TG (2022)

[7] Notwithstanding the fact that the air quality objectives and limit values do not apply to people in the workplace, such people can be affected by the exposure of $PM_{10}$. However, they are considered to be less sensitive than the general public as a whole because those most sensitive to the effects of air pollution, such as young children are not normally workers. For this reason workers have been included in the medium sensitivity category.

[8] There are no standards that apply to short-term exposure, e.g. one or two hours, but there is still a risk of health impacts, albeit less certain.

changes to soils or watercourses may lead to a loss of plants or animals for example via changes in acidity. Indirect effects can include increased susceptibility to stresses such as pathogens and air pollution. These changes are likely to occur only as a result of long-term demolition and construction works adjacent to a sensitive habitat.

An AA Screening and NIS have been prepared for the Proposed Development. These assessments concluded that, with the implementation of standard mitigation measures, the Proposed Development will not result in significant adverse effects on the integrity of the designated Natura 2000 sites.

Accordingly, any dust-related ecological impacts will be temporary and reversible, only occurring during the construction phase and ceasing once construction activities conclude. This outcome is supported by the mitigation measures outlined in Section 8.6, which include dust suppression and site management protocols in line with the IAQM (2024) guidance.

Table 8-6 provides an example of possible sensitivities:

*Table 8-6 Sensitivities of Receptors to Ecological Effects*

| Sensitivity | Features | Indicative Examples |
|---|---|---|
| High | • Locations with an international designation and the designated features may be affected by dust soiling; or<br>• Locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List for Ireland.[9] | • A Special Area of Conservation (SAC) designated for acid heathlands, or a local site designated for lichens adjacent to the demolition of a large site containing (alkali) buildings). |
| Medium | • Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or<br>• Locations with a national designation where the features may be affected by dust deposition. | • A Site of Special Scientific Interest (SSSI) with dust sensitive features. |
| Low | • Locations with a local designation where the features may be affected by dust deposition. | • A local Nature Reserve with dust sensitive features. |

Tables 8-7 – Table 8-9 illustrate how the sensitivity of the area may be determined for dust soiling, human health impacts and ecological impacts, respectively. It should be noted that the

[9] A Habitat Regulation Assessment of the site may be required as part of the planning process, if the site lies close to an internationally designated site i.e., Special Conservation Areas (SACs), Special Protection Areas (SPAs) designated under the Habitats Directive (92/43/EEC) and RAMSAR sites.

highest level of sensitivity from each table should be considered, as recommended by the IAQM.

The criteria detailed in Table 8-7 – Table 8-9 were used to determine the sensitivity of the area to dust soiling effects, human health impacts and ecological impacts for the Proposed Development.

*Table 8-7 Sensitivity of Dust Soiling Effects on People and Property*

| Receiver Sensitivity | Number of Receivers | Distance from the Source (m) | | | |
|---|---|---|---|---|---|
| | | <20m | <50m | <100m | <250m |
| High | >100 | High | High | Medium | Low |
| | 10-100 | High | Medium | Low | Low |
| | 1-10 | Medium | Low | Low | Low |
| Medium | >1 | Medium | Low | Low | Low |
| Low | >1 | Low | Low | Low | Low |

*Table 8-8 Sensitivity of the Area to Human Health Impacts*

| Receptor Sensitivity | Annual Mean $PM_{10}$ concentration | Number of Receptors | Distance from the Source (m) | | | |
|---|---|---|---|---|---|---|
| | | | <20 | <50 | <100 | <250 |
| High | >32 µg/m$^3$ | >100 | High | High | High | Medium |
| | | 10-100 | High | High | Medium | Low |
| | | 1-10 | High | Medium | Low | Low |
| | 28-32 µg/m$^3$ | >100 | High | High | Medium | Low |
| | | 10-100 | High | Medium | Low | Low |
| | | 1-10 | High | Medium | Low | Low |
| | 24-28 µg/m$^3$ | >100 | High | Medium | Low | Low |
| | | 10-100 | High | Medium | Low | Low |
| | | 1-10 | Medium | Low | Low | Low |
| | <24 µg/m$^3$ | >100 | Medium | Low | Low | Low |
| | | 10-100 | Low | Low | Low | Low |
| | | 1-10 | Low | Low | Low | Low |
| Medium | >32 µg/m$^3$ | >100 | High | Medium | Low | Low |
| | | 10-100 | Medium | Low | Low | Low |
| | | 1-10 | Medium | Low | Low | Low |
| | 28-32 µg/m$^3$ | >100 | Low | Low | Low | Low |
| | | 10-100 | Low | Low | Low | Low |
| | | 1-10 | Low | Low | Low | Low |
| | 24-28 µg/m$^3$ | >100 | Low | Low | Low | Low |
| | | 10-100 | Low | Low | Low | Low |
| | | 1-10 | Low | Low | Low | Low |
| | <24 µg/m$^3$ | >100 | Low | Low | Low | Low |
| | | 10-100 | Low | Low | Low | Low |
| | | 1-10 | Low | Low | Low | Low |
| Low | - | ≥1 | Low | Low | Low | Low |

*Table 8-9 Sensitivity of the Area to Ecological Impacts*

| Receptor Sensitivity | Distance from the Source (m) | |
|---|---|---|
| | <20 | <50 |
| High | High | Medium |
| Medium | Medium | Low |
| Low | Low | Low |

**Step 2C – Define the Risk of Impacts**

In accordance with the IAQM Guidance, the dust emission magnitude (Step 2A) and sensitivity of the area (Step 2B) have been combined and the risk of impacts from demolition, construction, earthworks and trackout have been determined (before mitigation is applied).

Tables 8-10 to 8-13 illustrate how the dust emission magnitude should be combined with the sensitivity of the area to determine the risk with no mitigation measures applied.

*Table 8-10 Risk of Dust - Demolition*

| Potential Impact | Dust Emission Magnitude | | |
|---|---|---|---|
| | Large | Medium | Small |
| High | High Risk | Medium Risk | Medium Risk |
| Medium | High Risk | Medium Risk | Low Risk |
| Low | Medium Risk | Low Risk | Negligible |

*Table 8-11 Risk of Dust – Earthworks*

| Potential Impact | Dust Emission Magnitude | | |
|---|---|---|---|
| | Large | Medium | Small |
| High | High Risk | Medium Risk | Low Risk |
| Medium | Medium Risk | Medium Risk | Low Risk |
| Low | Low Risk | Low Risk | Negligible |

*Table 8-12 Risk of Dust – Construction*

| Potential Impact | Dust Emission Magnitude | | |
|---|---|---|---|
| | Large | Medium | Small |
| High | High Risk | Medium Risk | Low Risk |
| Medium | Medium Risk | Medium Risk | Low Risk |
| Low | Low Risk | Low Risk | Negligible |

*Table 8-13 Risk of Dust – Trackout*

| Potential Impact | Dust Emission Magnitude | | |
|---|---|---|---|
| | Large | Medium | Small |
| High | High Risk | Medium Risk | Low Risk |
| Medium | Medium Risk | Low Risk | Negligible |
| Low | Low Risk | Low Risk | Negligible |

The risk of dust impacts is based on the potential dust emissions magnitude and the sensitivity of the area. These two factors are then combined to determine the risk of dust impacts with

no mitigation applied. For the Proposed Development, site-specific information has been used to inform the assessment, allowing for a more accurate determination of risk.

The risk of dust soiling, the effect on human health and the risk of ecological effects before mitigation are summarised in Section 8.5.1.

#### *8.2.2.2 Construction Phase Traffic Emissions*

Construction phase traffic has the potential to affect air quality. The TII guidance *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022), 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.

The demolition and construction stage traffic will not change by more than 1,000 AADT or 200 HDV AADT and does not meet the above scoping criteria. In addition, there are no proposed changes to the traffic speeds or road alignment. As a result, in accordance with TII guidance, a detailed air assessment of construction stage traffic emissions has been scoped out. This is considered a proportionate and appropriate approach, and no further assessment or precautionary measures are required.

### 8.2.3 Operational Phase

Operational phase traffic has the potential to affect local air quality as a result of increased vehicle movements associated with the Proposed Development. The TII scoping criteria detailed in Section 8.2.2.2 were used to determine if any road links will be affected by the Proposed Development and require inclusion in a detailed air quality modelling assessment.

Traffic flow information was obtained from NRB Consulting Engineers (2025) for the purposes of this assessment. Two different year scenarios are presented in Table 8-14 for the operational phase vehicle trip generation data. The 'Do Nothing' and 'Do Something' scenarios for the Opening Year (2028) and Design Year (2043) (which is Opening Year plus 15 years, as per TII Guidance).

The figures presented in Table 8-14 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 NRB Consulting Engineers and is based on project-specific traffic modelling undertaken by NRB Consulting Engineers.

*Table 8-14 Traffic Data*

| Link Number | Road Name | Opening Year (2028) | | Design Year (2043) | |
|---|---|---|---|---|---|
| | | Do Nothing | Do Something | Do Nothing | Do Something |
| | | AADT | AADT | AADT | AADT |
| 1 | Site Access | 171 (15%HDV) | 991 (2%HDV) | 193 (15%HDV) | 1,013 (2% HDV) |
| 2 | Lough Atalia Road (East) | 9,929 (4%HDV) | 10,259 (4%HDV) | 11,197 (4%HDV) | 11,528 (4%HDV) |
| 3 | Lough Atalia Road (West) | 9,972 (4%HDV) | 10,461 (4%HDV) | 11,246 (4%HDV) | 11,735 (4%HDV)) |
| 4 | Galway Harbour Dock Road 1 | 1,866 (15%HDV) | 1,949 (15% HDV) | 2,104 (15%HDV) | 2,188 (15% HDV) |
| 5 | Galway Harbour Dock Road 2 | 1,508 (15%HDV) | 1,591 (15%HDV) | 1,700 (15%HDV) | 1,784 (15%HDV) |
| 6 | Galway Harbour Dock Road 3 | 1,476 (15%HDV) | 1,664 (15% HDV) | 1,476 (15%HDV) | 1,664 (15% HDV) |
| 7 | Bothar na Long | 9,031 (2%HDV) | 9,603 (2%HDV) | 10,184 (2%HDV) | 10,757 (2%HDV) |
| 8 | Dock Road | 9,223 (2%HDV) | 9,493 (2%HDV) | 10,401 (2%HDV) | 10,671 (2%HDV) |

The operational phase traffic associated with the Proposed Development has been considered in the context of air quality impacts. Traffic data provided by NRB Consulting Engineers 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 site is located within the existing operational area of Galway Port. The site is generally bound as follows: by the Lough Atalia inlet/outlet to the east; by Dock Road to the south and southwest; and by lands in use for port activities and as a service station to the west.

### 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 2023"* (EPA, 2024). 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 Galway City and falls into 'Zone C' of Ireland which is described by the EPA as '*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'*. While the EPA does not explicitly define Zone C areas as suburban, the ambient air quality in these locations is generally influenced by similar sources, such as traffic emissions and domestic fuel combustion. In the context of Galway City, the assumption of suburban-like air quality characteristics reflects the expected pollutant profile in mixed-use urban areas outside of major metropolitan centres like Dublin or Cork.

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 ($NO_2$) and ozone ($O_3$). PM, $NO_2$ and $O_3$ 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, 2023' reports the quality of the air in Ireland based on the data from the National Ambient Air Quality Monitoring Network throughout the year 2023 (EPA, 2024).

When assessing air quality, the EPA focuses on two main pollutants: particulate matter and nitrogen oxides. Measured concentrations of $NO_2$ for the years 2022 and 2023 are presented in Table 8-15 for Zone C monitoring stations.

*Table 8-15 Concentrations of $NO_2$ at Zone C Monitoring Stations*

| Station | Objective | Concentration (µg/m³) | | Limit or Threshold Value |
|---|---|---|---|---|
| | | 2022 | 2023 | |
| **Meath Navan** | Annual Mean $NO_2$[10] | 21.0 | 22.2 | 40 µg/m³ |
| | Days >200µg/m³ | 0 | 0 | 35 days |

[10] $NO_2$ annual mean limit value for the protection of human health: 40 µg/m³ per station

| Station | Objective | Concentration (µg/m³) | | Limit or Threshold Value |
|---|---|---|---|---|
| | | 2022 | 2023 | |
| **Waterford Brownes Road** | Annual Mean $NO_2$ | 7.3 | 6.9 | 40 µg/m³ |
| | Days >200µg/m³ | 0 | 0 | 35 days |
| **Waterford Port** | Annual Mean $NO_2$ | - | 18.3 | 40 µg/m³ |
| | Days >200µg/m³ | - | 2 | 35 days |
| **Sligo**[11] | Annual Mean $NO_2$ | - | - | 40 µg/m³ |
| | Days >200µg/m³ | - | - | 35 days |
| **Limerick Henry Street** | Annual Mean $NO_2$ | 15.2 | 13.5 | 40 µg/m³ |
| | Days >200µg/m³ | 0 | 0 | 35 days |
| **Limerick People's Park** | Annual Mean $NO_2$ | - | 9.0 | 40 µg/m³ |
| | Days >200µg/m³ | - | 0 | 35 days |
| **Kilkenny Seville Lodge** | Annual Mean $NO_2$ | 4.8 | 4.4 | 40 µg/m³ |
| | Days >200µg/m³ | 0 | 0 | 35 days |
| **Portlaoise** | Annual Mean $NO_2$ | 9.0 | 8.3 | 40 µg/m³ |
| | Days >200µg/m³ | 0 | 0 | 35 days |
| **Dundalk** | Annual Mean $NO_2$ | 10.4 | 9.3 | 40 µg/m³ |
| | Days >200µg/m³ | 1 | 1 | 35 days |
| **Galway Eyre Square** | Annual Mean $NO_2$ | 17.6 | 16.9 | 40 µg/m³ |
| | Days >200µg/m³ | 0 | 0 | 35 days |

Based on the data summarised in Table 8-15, 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

[11] There is no data for Sligo in 2022 and 2023 due to operational issues

of $NO_2$ are well below the annual mean and 1-hour maximum limit values. In the year 2022, annual mean concentrations of $NO_2$ ranged from 4.8 – 21.0 ug/m$^3$ across all Zone C stations, with no exceedance of the maximum hourly limit (EPA, 2023). In the year 2023, annual mean concentrations of $NO_2$ ranged from 4.4 – 22.2 ug/m$^3$ across all Zone C stations, with no exceedance of the maximum hourly limit (EPA, 2024).

The closest representative urban background monitoring to the site which continuously monitors for concentrations of $NO_2$ is located in Galway Eyre Square (approx. 360m northwest of the site). Air quality monitoring carried out at this location is likely to be broadly representative of conditions that may be experienced at the site. Concentrations of $NO_2$ are well below the threshold limits contained within the regulations at the Galway Eyre Square monitoring station, with an annual mean of 17.6 ug/m$^3$ and 16.9 ug/m$^3$ measured in 2022 and 2023, respectively (EPA, 2023; EPA, 2024).

EPA 2023 background concentrations have been used in combination with correction factors to estimate annual average $NO_2$ concentrations in the region of the Proposed Development site for the base year (2024). These factors have been adapted from both TII (2011) and the UK Department of Food and Rural Affairs (DEFRA) roadside $NO_2$ 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 $NO_2$ concentrations based on expected changes in traffic and emissions. Based on these correction factors, the current estimated $NO_2$ concentration in the region of the Proposed Development site is 14.5 µg/m$^3$.

Measured concentrations of $PM_{10}$ for the years 2022 and 2023 are presented in Table 8-16 for Zone C monitoring stations.

*Table 8-16 Concentrations of $PM_{10}$ at Zone C Monitoring Stations*

| Station | Objective | Concentration (µg/m$^3$) | | Limit or Threshold Value |
|---|---|---|---|---|
| | | 2022 | 2023 | |
| **Portlaoise** | Annual Mean $PM_{10}$[12] | 12.0 | 11.0 | 40 µg/m$^3$ |
| | Days >50µg/m$^3$[13] | 0 | 0 | 35 days |
| **Ennis** | Annual Mean $PM_{10}$ | 20.0 | 16.4 | 40 µg/m$^3$ |
| | Days >50µg/m$^3$ | 21 | 11 | 35 days |
| **Sligo**[14] | Annual Mean $PM_{10}$ | - | - | 40 µg/m$^3$ |

[12] $PM_{10}$ annual mean limit value for the protection of human health: 40 µg/m$^3$ per station

[13] $PM_{10}$ daily limit for the protection of human health: No more than 35 days in a year >50 µg/m$^3$ per station

[14] There is no data for Sligo for 2022 or 2023 due to operational issues

| Station | Objective | Concentration (µg/m³) | | Limit or Threshold Value |
|---|---|---|---|---|
| | | 2022 | 2023 | |
| | Days >50µg/m³ | - | - | 35 days |
| Galway Rahoon | Annual Mean $PM_{10}$ | 12.6 | 12.7 | 40 µg/m³ |
| | Days >50µg/m³ | 0 | 0 | 35 days |
| Galway Briarhill | Annual Mean $PM_{10}$ | 14.2 | 12.1 | 40 µg/m³ |
| | Days >50µg/m³ | 0 | 0 | 35 days |
| Ballinasloe[15] | Annual Mean $PM_{10}$ | - | 13.7 | 40 µg/m³ |
| | Days >50µg/m³ | - | 1 | 35 days |
| Clonmel | Annual Mean $PM_{10}$ | 11.0 | 9.3 | 40 µg/m³ |
| | Days >50µg/m³ | 1 | 1 | 35 days |
| Claremorris | Annual Mean $PM_{10}$ | 7.9 | 8.1 | 40 µg/m³ |
| | Days >50µg/m³ | 0 | 0 | 35 days |
| Dundalk | Annual Mean $PM_{10}$ | 12.3 | 13.2 | 40 µg/m³ |
| | Days >50µg/m³ | 2 | 1 | 35 days |
| Carlow Town | Annual Mean $PM_{10}$ | 11.3 | 10.1 | 40 µg/m³ |
| | Days >50µg/m³ | 0 | 0 | 35 days |
| Waterford Brownes Road | Annual Mean $PM_{10}$ | 15.2 | 12.2 | 40 µg/m³ |
| | Days >50µg/m³ | 3 | 1 | 35 days |
| Waterford Port | Annual Mean $PM_{10}$ | - | 14.0 | 40 µg/m³ |
| | Days >50µg/m³ | - | 3 | 35 days |

[15] Station newly added in 2023, therefore low data capture for Ballinasloe in 2023

| Station | Objective | Concentration (µg/m³) | | Limit or Threshold Value |
|---|---|---|---|---|
| | | 2022 | 2023 | |
| **Navan** | Annual Mean $PM_{10}$ | 14.2 | 13.2 | 40 µg/m³ |
| | Days >50µg/m³ | 1 | 0 | 35 days |
| **Kilkenny Seville Lodge** | Annual Mean $PM_{10}$ | 17.5 | 13.9 | 40 µg/m³ |
| | Days >50µg/m³ | 2 | 0 | 35 days |
| **Letterkenny** | Annual Mean $PM_{10}$ | 14.2 | 13.4 | 40 µg/m³ |
| | Days >50µg/m³ | 6 | 3 | 35 days |
| **Wexford Town** | Annual Mean $PM_{10}$ | 14.5 | 12.7 | 40 µg/m³ |
| | Days >50µg/m³ | 5 | 1 | 35 days |
| **Limerick Henry Street** | Annual Mean $PM_{10}$ | 13.9 | 11.3 | 40 µg/m³ |
| | Days >50µg/m³ | 2 | 0 | 35 days |
| **Limerick People's Park** | Annual Mean $PM_{10}$ | 13.9 | 11.4 | 40 µg/m³ |
| | Days >50µg/m³ | 2 | 0 | 35 days |
| **Athlone** | Annual Mean $PM_{10}$ | 12.3 | 11.6 | 40 µg/m³ |
| | Days >50µg/m³ | 3 | 1 | 35 days |
| **Tralee** | Annual Mean $PM_{10}$ | 17.9 | 14.5 | 40 µg/m³ |
| | Days >50µg/m³ | 14 | 2 | 35 days |
| **Drogheda** | Annual Mean $PM_{10}$ | 11.9 | 10.9 | 40 µg/m³ |
| | Days >50µg/m³ | 0 | 0 | 35 days |
| **Naas** | Annual Mean $PM_{10}$ | 12.3 | 10.9 | 40 µg/m³ |
| | Days >50µg/m³ | 2 | 1 | 35 days |

| Station | Objective | Concentration (µg/m$^3$) | | Limit or Threshold Value |
|---|---|---|---|---|
| | | 2022 | 2023 | |
| **Greystones** | Annual Mean $PM_{10}$ | 11.6 | 10.7 | 40 µg/m$^3$ |
| | Days >50µg/m$^3$ | 0 | 0 | 35 days |
| **Bray** | Annual Mean $PM_{10}$ | 10.0 | 10.5 | 40 µg/m$^3$ |
| | Days >50µg/m$^3$ | 0 | 2 | 35 days |
| **Leixlip** | Annual Mean $PM_{10}$ | 11.2 | 10.1 | 40 µg/m$^3$ |
| | Days >50µg/m$^3$ | 1 | 0 | 35 days |

As is evident from the results shown in Table 8-16, current levels of $PM_{10}$ are well below the annual mean limit value. In the year 2022, annual mean concentrations of $PM_{10}$ ranged from 7.9 – 20.0 ug/m$^3$ across all Zone C stations, with no exceedance of short-term limit values (EPA, 2023). In the year 2023, annual mean concentrations of $PM_{10}$ ranged from 8.1 – 16.4 ug/m$^3$ across all Zone C stations, with no exceedance of short-term limit values (EPA, 2024).

The closest representative urban background monitoring to the site which continuously monitors for concentrations of $PM_{10}$ is located in Galway Rahoon (approx. 2.5 km from the site). Air quality monitoring carried out at this location is likely to be broadly representative of conditions that may be experienced at the site. Concentrations of $PM_{10}$ are well below the threshold limits contained within the regulations at Galway Rahoon monitoring station, with an annual mean of 12.6 ug/m$^3$ and 12.7 ug/m$^3$ measured in 2022 and 2023, respectively (EPA, 2023; EPA, 2024).

A conservative estimate of the background $PM_{10}$ levels for the region of the Proposed Development is 12.7 µg/m$^3$.

Measured concentrations of $PM_{2.5}$ for the years 2022 and 2023 are presented in Table 8-17 for Zone C monitoring stations.

*Table 8-17 Concentrations of $PM_{2.5}$ at Zone C Monitoring Stations*

| Station | Averaging Period | Year | |
|---|---|---|---|
| | | 2022 | 2023 |
| Portlaoise | Annual Mean $PM_{2.5}$ (µg/m$^3$)[16] | 8.1 | 7.4 |
| Ennis | | 15.6 | 12.3 |

[16] Annual average limit value - 25 µg/m$^3$ (EU Council Directive 2008/50/EC & S.I. No. 739 of 2022)
Daily limit value - 50 µg/m3 (EU Council Directive 2008/50/EC & S.I. No. 739 of 2022)

| Station | Averaging Period | Year | |
|---|---|---|---|
| | | 2022 | 2023 |
| Bray | | 5.7 | 5.7 |
| Sligo[17] | | - | - |
| Clonmel | | 7.3 | 6.1 |
| Carlow Town | | 7.4 | 6.5 |
| Waterford Brownes Road | | 9.9 | 7.8 |
| Waterford Port | | - | 7.6 |
| Navan | | 8.3 | 7.5 |
| Letterkenny | | 10.7 | 9.9 |
| Wexford Town | | 9.7 | 8.4 |
| Limerick People's Park | | 9.3 | 6.5 |
| Limerick Henry Street | | 8.4 | 7.2 |
| Athlone | | 8.9 | 8.3 |
| Tralee | | 12.9 | 10.0 |
| Drogheda | | 6.9 | 6.0 |
| Naas | | 7.5 | 6.6 |
| Greystones | | 6.9 | 6.3 |
| Leixlip | | 7.0 | 6.4 |
| Dundalk | | 19.8 | 8.9 |
| Galway Briarhill | | 9.8 | 7.1 |
| Ballinasloe[18] | | - | 10.2 |

As is evident from the results shown in Table 8-17, current levels of $PM_{2.5}$ are well below the annual mean limit value of 25 µg/m$^3$. In the year 2022, annual mean concentrations of $PM_{2.5}$ ranged from 5.7 – 15.6 ug/m$^3$ across all Zone C stations (EPA, 2023; EPA 2024). In the year 2023, annual mean concentrations of $PM_{2.5}$ ranged from 5.7 – 12.3 ug/m$^3$ across all Zone C stations (EPA, 2024).

[17] There is no data for Sligo in 2022 and 2023 due to operational issues

[18] Station newly installed in 2023, therefore low data capture for Ballinasloe in 2023

The closest representative urban background monitoring to the site which continuously monitors for concentrations of $PM_{2.5}$ is located in Galway Briarhill (approx. 4.5km from the site). Air quality monitoring carried out at this location is likely to be broadly representative of conditions that may be experienced at the site. Concentrations of $PM_{2.5}$ are well below the threshold limits contained within the regulations at Galway Briarhill monitoring station, with an annual mean of 9.8 ug/$m^3$ and 7.1 ug/$m^3$ measured in 2022 and 2023, respectively (EPA, 2023; EPA, 2024).

A conservative estimate of the background $PM_{10}$ levels for the region of the Proposed Development site is 8.5 µg/$m^3$.

All air quality data referenced in this chapter represents the most recent and publicly available information at the time of writing in 2025 (i.e. up to 2023) and are considered reliable for the purposes of this assessment.

### 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 Athenry, Co. Galway is located approximately 17.3km east of the Proposed Development site, provides weather data that is considered representative of conditions at the site.

The weather in the area of the site is generally dominated by cool oceanic air masses, with cool winters, mild humid summers, and a lack of temperature extremes. Based on meteorological data at Athenry over the last 3 years, the mean January temperature is 5.6°C, while the mean July temperature is 15.2°C. The prevailing wind direction is from a quadrant centred on the southwest. These are moderately warm, moisture-laden winds from the Atlantic, which frequently bring rainfall to the western seaboard, including Galway City. The expected annual rainfall for the eastern half of the country ranges between 750 and 1000mm. In contrast, Galway typically experiences higher annual rainfall due to its coastal location and exposure to Atlantic weather systems. Easterly winds are less frequent, weaker, and tend to bring cooler weather from the northeast in spring and warmer weather from the southeast in summer.

#### *8.3.3.1 Rainfall*

Table 8-18 illustrates the monthly and annual rainfall data collected over a three-year period (2022-2024) at Athenry Weather Station. The annual rates of precipitation ranged from 1160.6mm in 2024 to 1590.2mm 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 western half of the country.

*Table 8-18 Monthly Rainfall Values (mm) for Athenry Weather Station from January 2021 to December 2024 (Source: Met Eireann)*

| Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2024** | 92.4 | 159.1 | 130.5 | 100.7 | 59.0 | 58.9 | 71.5 | 159.0 | 46.6 | 112.7 | 88.0 | 82.2 | **1160.6** |
| **2023** | 113.9 | 42.0 | 185.9 | 93.4 | 63.5 | 93.8 | 224.1 | 129.1 | 148.2 | 179.9 | 113.5 | 202.9 | **1590.2** |
| **2022** | 56.9 | 143.1 | 39.0 | 51.6 | 78.9 | 79.4 | 66.0 | 79.6 | 114.2 | 199.3 | 156.2 | 114.3 | **1178.5** |
| **LTA[19]** | **122.7** | **93.2** | **89.7** | **72.8** | **77.7** | **80.0** | **103.0** | **104.5** | **101.5** | **118.0** | **121.5** | **130.8** | **1215.4** |

#### *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 Athenry synoptic weather station over a period of 14 years suggests that the predominant wind direction blows from the southwest, with windspeeds of between 7 and 10 knots occurring most frequently.

Figure 8-6 provides a wind speed frequency distribution which represents wind speed classes and the frequency at which they occur (% of time) at Athenry weather station over a period of 14 years. Wind speeds of 5 knots have the highest frequency, occurring approximately 10.5% of the time.

[19] Long-term Average

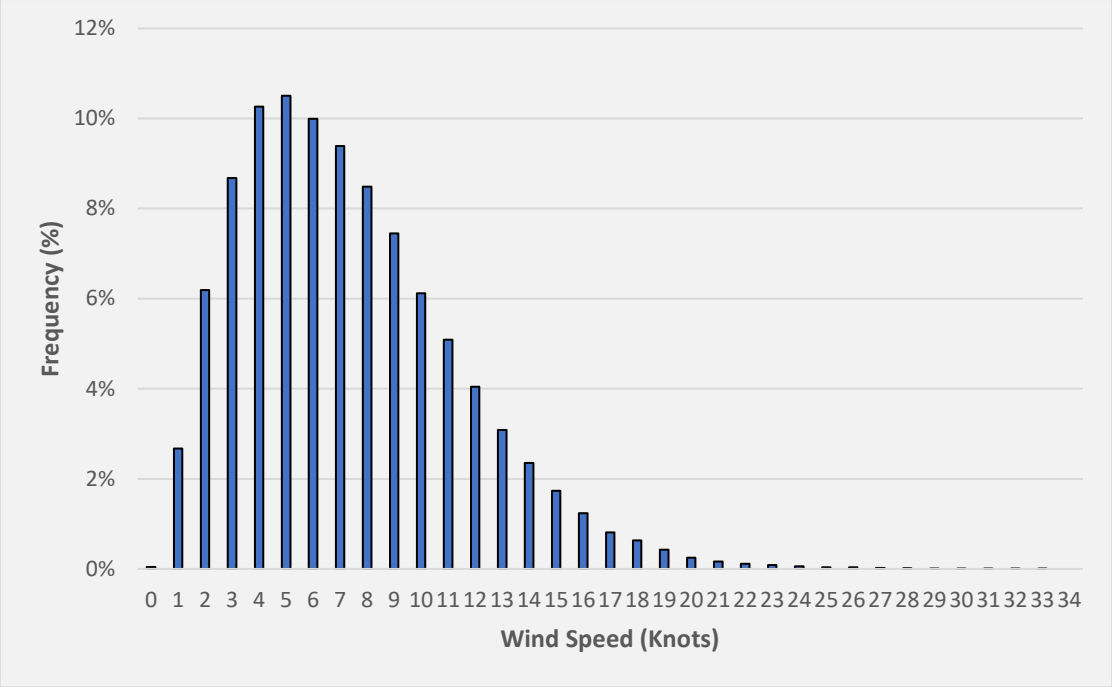



*Figure 8-6 Wind Speed Frequency Distribution at Athenry Synoptic Weather Station over 14 years (2011-2024)*

Figure 8-7 provides a wind rose, a graphical tool that displays the frequency of winds from different directions over a specific period, based on data from the Athenry synoptic weather station. As is visible from Figure 8-7, the prevailing wind is from a south-westerly direction with an annual incidence of 30.27% 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 7 and 10 knots, occurring in 31.44% of incidences, with wind speeds of between 4 and 6 knots occurring in 30.75% of incidences.

The lowest frequency is for winds blowing from the northern quadrant at approximately 4.12% of the time. The incidence of wind between 1 and 6 knots is about 48.29% with wind speeds of above 17 knots (8.7 m/s) occurring in just 2.67% of incidences. This wind rose is broadly representative of the prevailing conditions experienced at the site.

This wind rose is considered broadly representative of the prevailing conditions experienced at the site due to the proximity of the Athenry station and the similarity in topography and regional meteorological influences between the two locations.

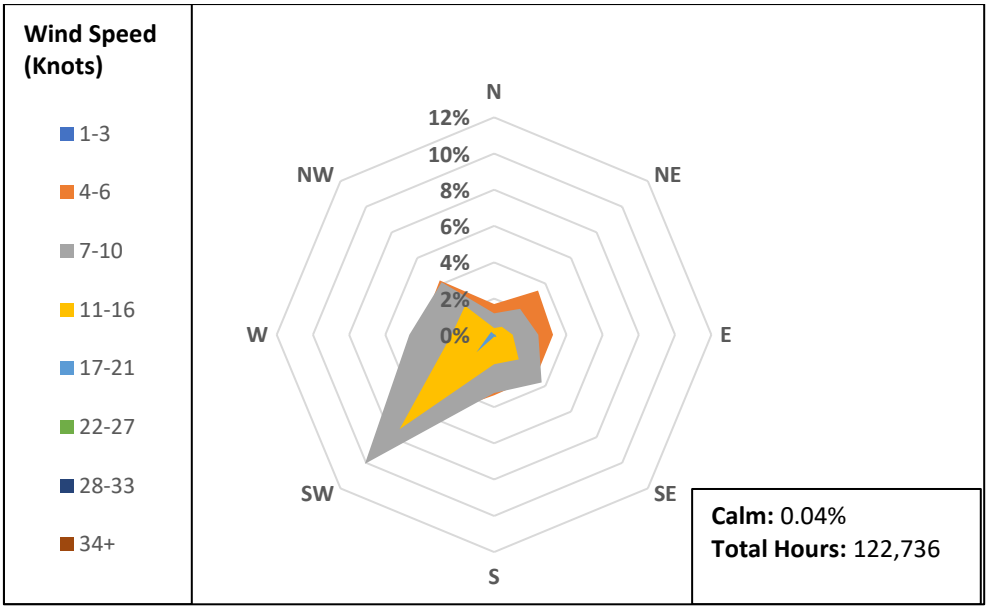



*Figure 8-7 14-year Windrose at Athenry Weather Station 2011-2024 (Developed using Met Eireann Hourly Data)*

## 8.4 Characteristics of the Proposed Development

A comprehensive description of the Proposed Development is presented in Chapter 2 (Description of the Proposed Development) of this EIAR.

### 8.4.1 Aspects Relevant to this Assessment

#### *8.4.1.1 Construction Phase*

The aspects of the construction phase relevant to this chapter are as follows:

- Dust deposition, resulting in the soiling of surfaces;
- Visible dust plumes, which are evidence of dust emissions;
- Elevated $PM_{10}$, $PM_{2.5}$ concentrations from demolition and construction activities (including earthworks and trackout); and
- An increase in concentrations of $PM_{10}$, $PM_{2.5}$ and nitrogen dioxide due to exhaust emissions from vehicles and equipment used on site (non-road mobile machinery) and vehicles accessing the site.

#### *8.4.1.2 Operational Phase*

The aspects of the operational phase relevant to this chapter are as follows:

- An increase in concentrations of $PM_{10}$, $PM_{2.5}$ and nitrogen dioxide due to exhaust emissions from vehicles and equipment used on site (non-road mobile machinery) and vehicles accessing the site.

## 8.5 Potential Effect of the Proposed Development

### 8.5.1 Construction Phase

#### *8.5.1.1 Dust*

There is potential for construction related air emissions to effect local air quality due to the Proposed Development. The IAQM *Guidance on the Assessment of Dust from Demolition and Construction* (2024) provides a framework for the assessment of risk, details of which are provided in Section 8.2 of this chapter.

**Potential Dust Emission Magnitude (Step 2A)**

The potential magnitude of dust emissions from demolition, construction, earthworks and trackout has been assessed, as identified in Table 8-19.

*Table 8-19 Dust Emission Magnitude for the site*

| Activity | Dust Emission Magnitude |
|---|---|
| Demolition | Small |
| Earthworks | Medium |
| Construction | Large |
| Trackout | Medium |

**Sensitivity of the Area (Step 2B)**

Table 8-20 outlines the sensitivity of the area to construction dust based on three factors: dust soiling, human health and ecology. The classification helps in assessing the potential effect of construction activities on air quality and guides mitigation.

*Table 8-20 Sensitivity of the Area*

| Sensitivity Type | Factors | Sensitivity of Area | |
|---|---|---|---|
| | | On-Site | Trackout |
| Dust Soiling | In order to account for a worst-case scenario, the sensitivity of the area has been classified as high for on-site activity (demolition, earthworks and construction) and trackout. | High | High |
| Human Health | As per Section 8.3.1, a conservative estimate of the background $PM_{10}$ levels for the region of the Proposed Development is 12.7 µg/m$^3$. As the $PM_{10}$ concentration is less than 24 µg/m$^3$, the sensitivity of the area to human health effects is considered to be low. | Low | Low |
| Ecology | The Inner Galway Bay Special Protection Area SPA and Lough Corrib SAC are located directly adjacent to the site. The Inner Galway Bay Special Protection Area SPA and Lough Corrib SAC can be classified as a high sensitivity receptor to | High | High |

| Sensitivity Type | Factors | Sensitivity of Area | |
|---|---|---|---|
| | | On-Site | Trackout |
| | dust soiling for both on-site activity (demolition, earthworks and construction) and trackout. | | |

**Risk of Dust Impacts (Step 2C)**

The outcomes of the assessments of potential magnitude of dust emissions and the sensitivity of the area are combined to determine the risk of impact. This risk is then used to inform the selection of appropriate mitigation. Table 8-21 details the risk of dust impacts for demolition, earthworks, construction and trackout activities.

*Table 8-21 Summary of Unmitigated Risks*

| Potential Impact | Sensitivity | Magnitude | | | |
|---|---|---|---|---|---|
| | | Demolition | Earthworks | Construction | Trackout |
| | | Small | Medium | Large | Medium |
| Dust Soiling Impacts | High | Medium Risk | Medium Risk | High Risk | Medium Risk |
| Human Health Impacts | Low | Negligible | Low Risk | Low Risk | Low Risk |
| Ecological Impacts | High | Medium Risk | Medium Risk | High Risk | Medium Risk |

The dust risk categories for each of the four activities determined in STEP 2C have been used to define the appropriate, site-specific, mitigation measures to be adopted in Section 8.6.1 of this chapter (Step 3 as per the IAQM *Guidance on the assessment of dust from demolition and construction* (2024) (see Section 8.2 of this chapter)).

For those cases where the risk is assigned as ‘negligible’, no mitigation measures beyond those required by legislation are required. However, additional mitigation measures as defined in Section 8.2 will be applied as part of good practice.

### *8.5.1.2 Traffic Assessment*

There is also the potential for traffic emissions to affect air quality in the short-term over the construction phase, particularly due to the increase in HDVs accessing the site. NRB Consulting Engineers Ltd (2025) have confirmed that the projected demolition and construction traffic volumes fall below the thresholds set out in TII guidance. This information was provided directly by NRB Consulting Engineers and reflects project-specific traffic modelling undertaken by NRB Consulting Engineers.

However, as outlined in Section 8.2.2.2, the construction stage traffic has been reviewed against the scoping criteria set out in TII guidance document Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106 (TII, 2022). None of the affected road links meet the thresholds for inclusion in a detailed local air quality assessment.

Specifically, the projected changes in traffic volumes, HDVs, speeds and road alignment fall below the defined criteria. Therefore, in accordance with TII guidance, a detailed air quality assessment has been scoped out. This is considered a proportionate and appropriate approach, and no further assessment or precautionary measures are required.

It can be determined that the construction stage traffic will have a ***direct, short-term, negative*** and ***imperceptible*** effect on air quality and human health, which is overall not significant in EIA terms.

### 8.5.2 Operational Phase

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 8.2.2.2.

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 effects have the potential to arise locally when construction activities associated with the Proposed Development occur simultaneously with other developments in the area. A review of other off-site developments was completed as part of this assessment. Chapter 2 (Description of the Proposed Development) of this EIAR details the existing, proposed, and granted planning permissions on record in the area, and this review has informed the consideration of cumulative impacts. The cumulative assessment presented in this chapter is informed by the list of existing, permitted, and proposed developments outlined in Chapter 2 (Description of the Proposed Development) of this EIAR, which should be referred to for full details.

The assessment has considered the potential for cumulative effects arising from the Proposed Development in combination with other permitted or existing developments, particularly in relation to dust and traffic emissions. In terms of dust, no significant effects are predicted from the Proposed Development alone, and good construction practice, including the implementation of identified mitigation measures, will be employed to minimise emissions. The cumulative assessment takes into account the nature, scale, and timing of nearby developments. Based on available planning information, the Proposed Development is scheduled to commence in December 2026 and is therefore not expected to overlap with the construction phases of the identified cumulative schemes. Furthermore, the demolition and construction phases of the Proposed Development are relatively short in duration, approximately 30 months in total, which further reduces the likelihood of concurrent dust-generating activities. Where any limited overlap may occur, it is assumed that similar mitigation measures will be in place, further reducing the potential for cumulative impacts.

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 Proposed Development were not to proceed, ambient air quality at the site will remain as per the baseline and will change in accordance with trends within the wider area (including influences from potential new developments in the surrounding area, changes in road traffic etc). Under the Do-Nothing Scenario, construction works associated with the Proposed Development will not take place. Effects from increased traffic volumes and associated emissions from the Proposed Development will also not occur.

In addition, the absence of the Proposed Development may result in future housing demand being met through alternative developments in less centrally located areas. These locations are typically more reliant on private car use and may have reduced access to sustainable transport infrastructure. As a result, the overall air pollutant emissions associated with dispersed residential development could be higher than those associated with a more centrally located, well-connected site. This scenario could lead to increased regional traffic volumes and associated emissions, potentially resulting in less favourable air quality outcomes over time.

## 8.6 Avoidance, Remedial and Mitigation Measures

### 8.6.1 Construction Phase

To minimise potential air quality impacts during construction, a suite of best practice mitigation measures will be implemented at the Proposed Development site. These measures are informed by guidance from the IAQM (2024) and are designed to effectively manage dust and emissions. The following measures will be adopted as appropriate to the scale and nature of the works:

**Communications**

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site;
- Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager;
- Display the head or regional office contact information; and
- Develop and implement a Dust Management Plan (DMP), the final dust management plan will form part of the overall construction management plan which will formally be prepared and submitted to Galway City Council post grant of planning permission.

**Site Management**

- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken;
- Make the complaints log available to the local authority when asked;
- Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the log book; and
- Hold regular liaison meetings with other high risk construction sites within 250m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.

**Monitoring**

- Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to Galway City Council when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary;
- Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to Galway City Council when asked; and
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

**Preparing and Maintaining the site**

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible;
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site;
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period;
- Avoid site runoff of water or mud;
- Keep site fencing, barriers and scaffolding clean using wet methods;
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below; and
- Cover, seed or fence stockpiles to prevent wind whipping.

**Operating Vehicle/Machinery and Sustainable Travel**

- Ensure all vehicles switch off engines when stationary - no idling vehicles;
- Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable; and
- A speed restriction of 20 km/hr will be applied as an effective control measure for dust for on-site vehicles using unpaved haul roads.

**Operations**

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems;
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/ mitigation, using non-potable water where possible and appropriate;
- Use enclosed chutes and conveyors and covered skips;
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate; and
- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

**Waste Management**

- No bonfires and burning of waste materials.

**Measures Specific to Demolition**

- Ensure effective water suppression is used during demolition operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground;
- Avoid explosive blasting, using appropriate manual or mechanical alternatives; and
- Bag and remove any biological debris or damp down such material before demolition;

**Measures Specific to Earthworks**

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable;
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable; and
- Only remove the cover in small areas during work and not all at once.

**Measures Specific to Construction**

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case appropriate additional control measures will be in place.

**Measures Specific to Trackout**

- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use;
- Avoid dry sweeping of large areas;

- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport;
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable;
- Record all inspections of haul routes and any subsequent action in the site log book;
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems or mobile water bowsers and regularly cleaned;
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable);
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permit; and
- Access gates to be located at least 10 m from receptors where possible.

**Measures Specific to Ecological Receptors**

- Dust suppression: Using water sprays, dust suppressants, or covering materials to reduce dust particles;
- Vegetative barriers: Planting trees, shrubs or grasses to act as windbreaks and capture dust particles;
- Site management: Implementing good housekeeping practices, such as regular cleaning of access roads and minimising the movement of vehicles on unpaved surfaces;
- Monitoring: Regularly monitoring dust levels and ecological receptors to ensure that mitigation measures are effective; and
- Timing of activities: Scheduling dust-generating activities during periods of low wind or when ecological receptors are less sensitive.

These measures will be monitored and reviewed throughout the construction phase to ensure their effectiveness and compliance with relevant standards.

### 8.6.2 Operational Phase

It has been determined that the operational phase air quality effect is imperceptible and, therefore, no site-specific mitigation measures are proposed.

### 8.6.3 “Worst Case” Scenario

A worst-case scenario has been applied in Step 2A (defining the potential dust emission magnitude) of the construction dust impact assessment and the highest risk category has been used to inform the selection of appropriate mitigation measures for the Proposed Development.

It is expected that adequate mitigation measures, as outlined in Section 8.6.1, will assist in preventing nuisance dust from resulting in any significant effects. However, even with the most rigorous DMP in place, it is not possible to guarantee that the dust mitigation measures will be effective all the time, and if, for example, dust emissions occur under adverse weather conditions, or there is an interruption to the water supply used for dust suppression, the local community may experience occasional, short-term dust annoyance. The likely scale of this

would not be considered sufficient to change the conclusion that with mitigation the effects will be 'not significant'.

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, even though the resulting volumes remained below the thresholds set out in TII guidance. 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

The IAQM recommends that significance is only assigned to an effect after considering the construction activity mitigation. The risk of dust impacts has been determined in Step 2C and the appropriate dust mitigation measures identified in Step 3 (see Section 8.6.1 of this chapter). The final step is to determine whether there are significant effects arising from the construction phase of the Proposed Development. With the proposed mitigation measures in place, the residual effects from construction dust are predicted to be not significant.

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

The monitoring of construction dust during the construction phase of the Proposed Development will be undertaken to ensure that effects are not experienced beyond the Proposed Development site boundary. Monitoring of dust can be carried out by using the Bergerhoff Method. This 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 should be carried out in consideration of the requirements of *VDI 2119* with respect to the location of the samplers relative to buildings and other obstructions, height above ground, and sample collection and analysis procedures. After the exposure period is complete, the gauges should be removed from the site; the dust deposits in each gauge will then be determined gravimetrically and expressed as a dust deposition rate in $mg/m^2/day$ in accordance with the relevant standard.

Due to the negligible effect on air quality from the operational phase of the Proposed Development, no specific monitoring is recommended except for monitoring via the Bergerhoff Method.

## 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

The Proposed Development has the potential to generate dust during demolition and construction and emissions from traffic during the operational phase, which could affect nearby sensitive receptors if not properly managed.

However, the mitigation measures employed at the Proposed Development during demolition and construction, as outlined in Section 8.6.1, will ensure that all effects are compliant with ambient air quality standards, and that exposure levels remain below thresholds known to impact 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 in conjunction with Chapter 5 (Biodiversity). During the demolition and construction phase, dust emissions could potentially affect nearby habitats and species. However, the mitigation measures outlined in this chapter will minimise dust deposition and no significant impacts on designated sites or sensitive ecological receptors are anticipated. No significant interactions are expected during the operational phase.

### 8.9.3 Land and Soils

Construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential to generate dust, which may interact with land and soils. This interaction has been considered alongside Chapter 6 (Land and Soils). With the application of the appropriate dust control measures, no significant effects are predicted during the construction phase. There are no potentially significant interactions identified during the operational phase between air quality and land and soils.

### 8.9.4 Climate

Air quality and climate are interrelated due to shared sources of emissions, particularly from the combustion of fossil fuels during both the demolition/construction and operational phases of the Proposed Development. These activities generate pollutants that contribute to both local air quality impacts and global climate change.

During the construction phase, emissions may arise from machinery, equipment, and vehicle movements, contributing to both air pollutants and greenhouse gases. During the operational

phase, traffic-related emissions associated with the Proposed Development are the primary source of ongoing contributions to climate-related impacts.

While air quality does not directly influence climate, the sources of emissions that affect both are closely linked. As such, the assessment of air quality has been undertaken in parallel with the climate assessment presented in Chapter 9 (Climate) to ensure consistency in the evaluation of emissions and their potential impacts.

Based on the nature and scale of the Proposed Development, and the mitigation measures in place, no significant effects on climate are anticipated during either the construction or operational phases.

### 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.

## 8.10 Difficulties Encountered When Compiling

No difficulties have been encountered while compiling this chapter.

## 8.11 Conclusion

The Air Quality chapter has assessed the potential impacts and effects arising from the demolition, construction and operational phases of the Proposed Development, including dust emissions, traffic-related pollutants, and cumulative interactions. Mitigation measures have been identified in accordance with IAQM and TII guidance and will be implemented to ensure compliance with ambient air quality standards. With these measures in place, the residual effects on air quality are predicted to be not significant. The site is considered suitable for the Proposed Development from an air quality perspective.

## 8.12 References

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# 9 CLIMATE

## 9.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) identifies, describes, and presents an assessment of the potential significant direct and indirect effects of the Proposed Development at Galway Port at Dock Road and Lough Atalia Road, Galway City on climate (for example greenhouse gas (GHG) emissions) and its vulnerability to climate change.

It should be read in conjunction with Chapter 8 (Air Quality), Chapter 12 (Material Assets-Traffic and Transport) and the Traffic and Transport Assessment (TTA) (NRB Consulting Engineers Ltd, 2025), as well as the Climate Action Energy Statement (Axiseng Consulting Engineers, 2025), Building Life Cycle Assessment Report (Aramark, 2025) and Flood Risk Assessment (FRA) (TOBIN, 2025) submitted under separate cover with the planning application.

The Land Development Agency (LDA) intends to apply to Galway City Council (GCC) for permission for a 'Large-scale Residential Development' (LRD) of 356 no. Apartments and associated mixed-uses at a site of 1.621 Ha in Galway Port at Dock Road and Lough Atalia Road, Galway City, and extending to include parts of both roads for road infrastructure works and water services infrastructure works.

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 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 building life expectancy. It categorises GHG emissions into four main stages based on BS EN 15978: Production (embodied carbon from raw material extraction to product manufacturing), Pre-construction/Construction (effects from product delivery and assembly), Operational (emissions from building operations, maintenance, and replacement), 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 and 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

This chapter of the EIAR has been prepared by Aoife Gillen of DNV. Aoife holds a Master of Science (Hons) degree in Environmental Health, is a Chartered Environmental Health Practitioner, and Certified Energy Manager. Aoife has worked as a Principal Sustainability Consultant with DNV since March 2024 and has built up experience preparing Climate Change

Impact Assessments, Environmental Impact Assessment (EIA) Screening Reports, Climate Chapters, Climate Impact Statements and Carbon assessments. Aoife has been involved in the preparation of EIARs for the following projects:

- N&C Kilmeague Quarry GHG Assessment;
- Dyke Road Galway LRD Climate Change Impact Assessment;
- DRES Properties Railpark Maynooth LRD Climate Chapter;
- Glenveagh Ford LRD Climate Chapter; and
- Kilmore Quay Integrated Tourism Resort Complex Climate Chapter.

This chapter has been reviewed by Laura Griffin, Environmental Consultant at DNV. Laura has a Master of Science (Hons) degree in Climate Change from Maynooth University and a Bachelor of Arts (Hons) degree in English and Geography from Maynooth University. Laura has 5+ years of professional experience. Laura has experience preparing Environmental Impact Assessment (EIA) Screening Reports and a EIAR chapters for developments of a similar scale and nature to the Proposed Development.

This chapter was further reviewed by Gráinne Ryan, Principal EIA Consultant at DNV. Gráinne is an Environmental Consultant with over 11 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.

## 9.2 Greenhouse Gas Emissions in Ireland

Ireland's latest GHG emissions 1990-2023 (updated March 2025 and annually at this time) are based on the Sustainable Energy Authority Ireland's (SEAI's) provisional energy balance released in July 2025 (Environmental Protection Agency (EPA), 2025). In 2023, Ireland's GHG emissions were estimated to be 58.82 million tonnes carbon dioxide equivalent (Mt CO2 eq), which is 6.1% lower (or 3.79 Mt CO2 eq) than emissions in 2022 (62.26 Mt CO2 eq) and follows a 3.0% decrease in emissions reported in 2022.

Arresting growth in emissions is a challenge in the context of a growing economy but one which must continue to be addressed by households, businesses, farmers, and communities if Ireland is to reap the benefits of a low-carbon economy.

The provisional GHG emission inventory for 2023 is the third of ten years over which compliance with targets set in the European Union's (EU) Effort Sharing Regulation (EU 2018/842) will be assessed. This Regulation sets 2030 targets for emissions 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 its GHG emissions by at least 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 2023 was 40.52 Mt CO2eq. Ireland's provisional 2023 GHG ESR emissions were 42.79 Mt CO2eq, this is 2.27 Mt CO2eq more than the annual limit for 2023. This value is the national total emissions less emissions generated by stationary combustion i.e. power plants, cement plants, and domestic aviation operations that are within the EU's emissions trading scheme. Cumulatively from 2021-2023 and after using the ETS flexibility, Ireland is in compliance with the ESR by a net distance to target of 0.15 Mt CO2eq, although in 2023 there is an exceedance of 0.36 Mt CO2eq above its Annual Emissions Allocation with the ETS flexibility. Agriculture and Transport accounted for 76.0% of total ESR emissions in 2023. The revised Land Use, Land Use Change, and Forestry (LULUCF) Regulation (2023) 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, 2024).

The latest projections (May 2025) indicate that currently implemented measures (With Existing Measures) will achieve a reduction of 9% 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 25% by 2030, still short of the 42% reduction target (EPA, 2024).

In terms of the 2030 targets, the ESR provides two flexibilities (use of ETS allowances and credit from action undertaken in the 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. 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 CO2 eq per annum), with no flexibility available in the second 5-year period (EPA, 2025).

Ireland's GHG emissions increased in the period from 1990 to 2001 where it peaked at 70.82 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 2.0% 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. Ireland's GHG emissions have decreased by 1.2% from 1990-2023 (EPA, 2024).

In relation to the GHGs, carbon dioxide ($CO_2$) accounted for 61.0% of the total, with methane ($CH_4$) and nitrous oxide ($N_2O$) contributing 28.9% and 8.8% as CO2 equivalent, respectively and F-gases contributing 1.3% of the total as $CO_2$ equivalent (EPA, 2024).

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%. This information is present in Figure 9-1.

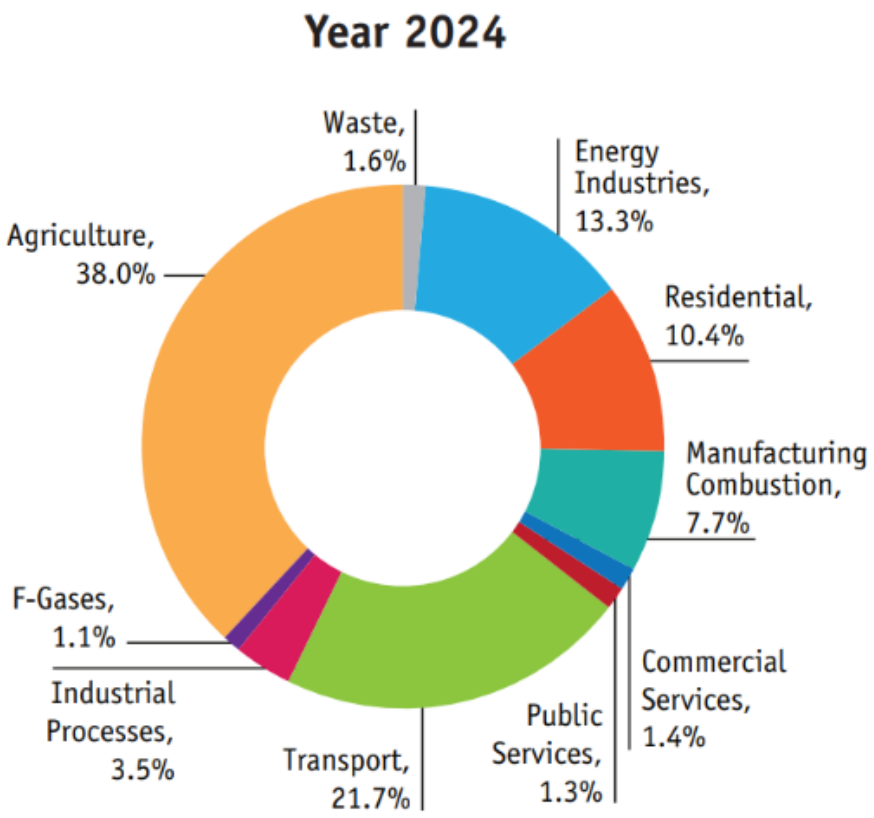



*Figure 9-1 Ireland's Greenhouse Gas Emissions Share by Sector 2024 (Source: EPA, 2025)*

The Climate Change Advisory Council (CCAC) 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; and
- 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 renewables; and
  - Full depreciation of fossil fuel assets by 2050, especially in the gas network.

## 9.3 Legislation, Policy and Guidance

The key legislation and guidance reviewed and referenced in the preparation of the EIAR is outlined in Chapter 1 (Introduction). 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 Greenhouse Gas 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 (IPPC, 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 will be assessed based on the GHG inventory submission in 2022 for 1990-2020 data. 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 presents the 17 SDGs.




*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 (Department of the Environment, Climate and Communications (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 (European Environment Agency (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 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 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 Non-Financial Reporting Directive (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).

Should the client fall in scope for CSRD, the results from this Climate Chapter should be reviewed in line with the materiality assessment and annual CSRD disclosure requirements. Specifically, the findings may serve as an evidence base for EFRAG Standard ESRS E1 CLIMATE CHANGE see Figure 9-3 below.

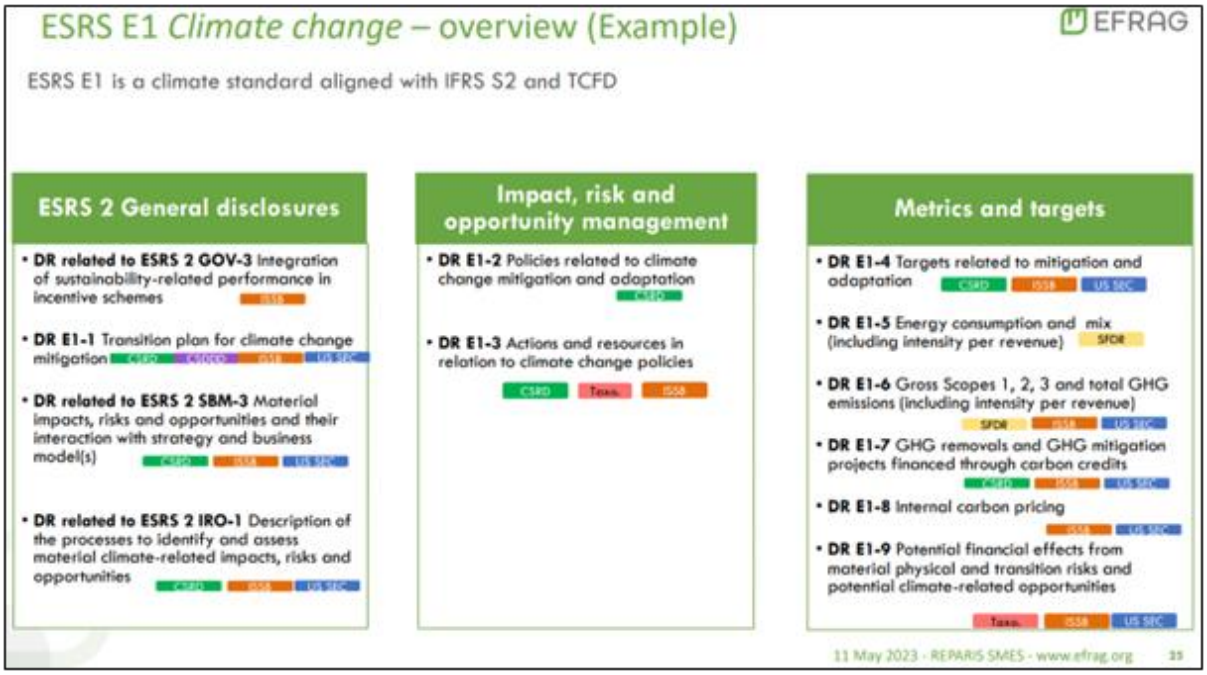



*Figure 9-3 ESRS E1 Climate Change: presented by Eric Duvaud, EFRAG SR TEG member (Source: The first set of ESRS – the journey from PTF to delegated act (adopted on 31 July 2023) – EFRAG)*

The data/information from this chapter of the EIAR 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 and is due to be transposed into Irish law by July 2026. The core elements of this duty are identifying, bringing to an end, preventing, mitigating and accounting for negative human rights and environmental impacts in a 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 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; and
- To meet these targets, the government published a set of Sectoral Emissions Ceilings in July 2022, and each sector has been assigned a % reduction target on the 2018

baseline to achieve a ceiling of 295 Mt CO2eq by 2025 and 200 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 (Jan 2025). 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. 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; and
- 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.

***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. The present report primarily examines the effect of climate change (Government; 2021). However, due consideration should 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; and
- 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 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 CAP25, CAROs play a critical role in:

- Capacity building within local government;
- Mainstreaming adaptation into planning and development;
- Facilitating cross-sectoral collaboration; and
- Supporting alignment with national climate objectives and sectoral adaptation plans.

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 Galway City Council Climate Action Plan 2024-2029

In February 2024, GCC adopted the Galway City Council Climate Action Plan 2024-2029 (GCC CAP). The GCC CAP is the climate adaptation and mitigation strategy for the City, 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 City. Aligned to the Government's National Climate Objective (as set out in the national CAP25, the new GCC 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; and
- Sustainability and Resource Management

The actions in these themes collectively address the main goals and targets of this plan:

1. 50% improvement in GCC's energy efficiency by 2030;
2. 51% reduction in GCC's greenhouse gas emissions by 2030;
3. To make GCC 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 GCC 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, GCC has reviewed the risks posed by climate change for the City and the implications of these risks for the delivery of services by GCC. 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 effects are assessed.

### 9.3.6 Galway City Development Plan (CDP) 2023-2029

The Galway City Development Plan (GCDP) outlines the strategic vision and policy framework for the sustainable development of Galway City from 2023 to 2029. A central pillar of the plan is the commitment to climate resilience and low-carbon transition, with climate action integrated across all planning domains.

The Climate Action chapter of the GCDP sets out targeted policy objectives that reflect GCC's ambition to lead in climate innovation and sustainability. These objectives are designed to support both mitigation (reducing emissions) and adaptation (building resilience), and include:

- Nature-Based Solutions: Enhancing biodiversity and ecosystem services to support climate resilience;
- Flood Risk & Water Management: Addressing vulnerabilities through sustainable drainage and flood mitigation;
- Renewable Energy: Promoting clean energy generation and energy efficiency;
- Transport: Encouraging active travel, public transport, and low-emission mobility;
- Built Environment: Improving building standards and retrofitting for energy efficiency; and
- Cross-Cutting Climate Policies: Embedding climate action across all sectors and governance levels.

These priorities align with Galway's broader commitments under national and EU frameworks, including the Climate Action and Low Carbon Development Act (2021) and the EU Mission for Climate Adaptation.

The creation of a climate resilient and carbon-neutral Galway City by 2050 is a strategic outcome that permeates the entire Development Plan. Climate action is mainstreamed into multiple chapters, ensuring that every planning decision contributes to a more sustainable future.

The GCC CAP aims to create a cleaner, greener, and more resilient City. The Climate Action Plan has 130 specific actions that have either been delivered, are in development stage or drafted for future implementation.

The Galway Climate Adaptation Strategy (GCC, 2019) includes 68 adaptation measures to deliver across six significant goals to mitigate climate change. The delivery of these goals varies between 1-5 years contingent on the aim.

### 9.3.7 LDA Sustainability and climate adaptation

The LDA also aims to support national, regional, and local climate policy. Collaboration and innovation are central to the success of this Strategy. The LDA Sustainable Development Strategy 2024–2028 was officially published in 2024. It marks the LDA's first comprehensive framework for embedding sustainability across all aspects of its housing and land development activities. The LDA has cultivated strong relationships with partners across a wide range of sectors – Government Departments and Agencies, Local Authorities, State bodies, third level institutions, home builders and industry peers – and will maximise these connections to deliver its sustainability ambitions.

The key components of The LDA climate adaptation objectives from the 2024-2028 strategy include:

- Compliance with EU Taxonomy DNSH requirements re: climate adaptation and use of nature-based solutions;
- Establish best practice approach to climate adaptation and resilience in external spaces via publication of LDA Sustainable Design Guidelines;
- Establish best practice approach to climate adaptation in buildings via LDA Sustainable Design Guidelines; and
- HPI EC 6.2 - Level 1 Assessment in accordance with Appendix A of EU Taxonomy annex satisfies the requirements of DNSH 2 - climate change adaptation to take place early in the design process (post stage 1a) Mitigation measures to be integrated into design process.

The LDA Sustainability Strategy 2024-2028 has identified two main strategic objectives in the short to medium term:

- Mitigating embodied carbon impact; and
- Focusing on the potential for Biodiversity Net Gain (BNG) across their portfolio.

These are part of a suite of six strategic objectives which form the core of this strategy, and which will enable The LDA to deliver on their guiding principles and vision. These objectives are as follows:

- Reduce Carbon (Embodied and Operational);
- Promote Water Stewardship;
- Optimise Sustainable Land-Use & Mobility;
- Enhance Biodiversity & Climate Resilience;
- Promote Circularity; and
- Support the Creation of Social Value.

### 9.3.8 Guidance

This 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 as follows:

- 2030 Climate and Energy Policy Framework (European Commission, 2014);
- 2030 EU Climate Target Plan (European Commission, 2021b);
- Assessing GHG Emissions and Evaluating their Significance (Institute of Sustainability & Environmental Professionals (ISEP), 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);
- Irish Green Building Council, Land Development Agency (LDA), and Environmental Protection Agency (EPA). The Carbon Designer for Ireland Tool;
- 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); and
- Integrating Climate Change into Strategic Environmental Assessment in Ireland – A Guidance Note (EPA, 2015).

## 9.4 Study Methodology

$CO_2$ emissions have a global climate warming effect. This is regardless of rate of release, location or the weather when released into the atmosphere. This contrasts with 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 effect.

Local ambient concentrations of $CO_2$ 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 $CO_2$ released into the atmosphere will contribute to climate warming, the extent of which is determined by the magnitude of the release. Although $CO_2$ emissions are typically expressed as kilogrammes or tonnes per year, there is a cumulative effect of these emissions because $CO_2$ 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 greenhouse gas assessment (GHGA) and a climate change risk assessment (CCRA).

- GHGA – This evaluation estimates the greenhouse gas 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 and the Irish Green Building Councils (IGBC) Lifecycle Assessment Tool have been used for this assessment; and
- 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 sections.

## 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 has been outlined in Chapter 2 (Description of the Proposed Development)

## 9.6 Survey Methodology

### 9.6.1 Desk Surveys

A desktop study involving the review of various national and international documents on climate change and analysis of synoptic climate change meteorological data from the nearest Met Éireann station (Shannon Airport) was carried out in order to compile this chapter. Although there is a Met Éireann weather station located nearby in Athenry, Galway it does not record long-term climate data.

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:

- Chapter 2: Description of the Proposed Development, DNV, 2025;
- Chapter 12: Material Assets-Traffic and Transport, NRB Consulting Engineers Ltd, 2025;
- Building Lifecycle Report Aramark 2025;
- Flood Risk Assessment, TOBIN, 2025; and

- Climate Change Impact Assessment, JBA, 2025.

### 9.6.2 Climatics

**Summary of the Approach**

This DNV assessment was primarily based on the on-site climate risk projections generated by the 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.

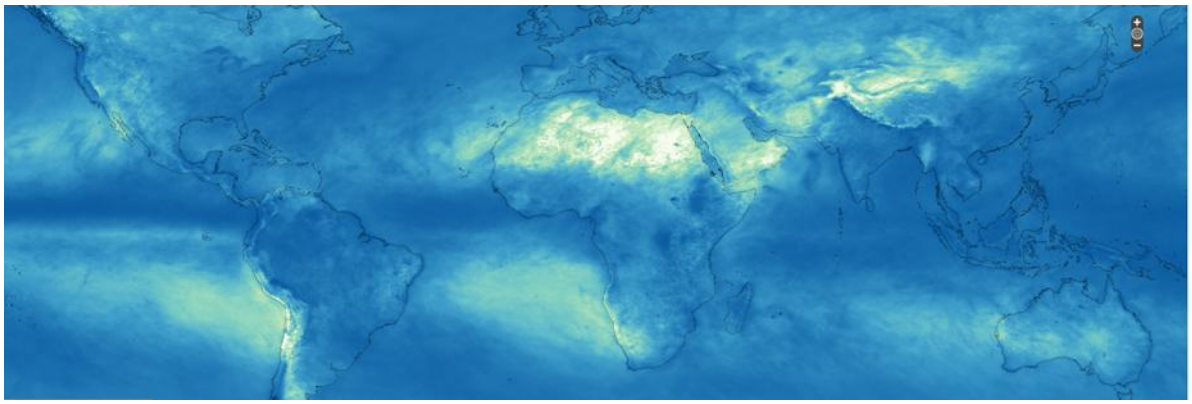


*Figure 9-4 Multi-Model Ensembled Rainfall Projection for 2050 (SSP5-8.5)*

### 9.6.3 Field Surveys

No site-specific baseline surveys were undertaken as part of the assessment for climate as the GHG and climate data is based on historic records and projections available online. The baseline data presented in this section is derived from the EPA Projections and the Met Éireann monitoring network and is 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 (formerly known as IEMA) guide 'Assessing Greenhouse Gas Emissions and Evaluating their Significance', 2nd Edition, 2022. The following aspects of the Proposed Development are assessed in this chapter:

- Potential direct GHG emissions associated with the construction of the Proposed Development – this includes site clearance, embodied carbon, material transport, construction 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 project during different life stages to determine the total effect of the development on climate. The building 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 effects) 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 effects stem from the delivery of construction products to the site and their subsequent processing and assembly into the building. This aspect has been incorporated into the assessment's scope.
- Operational Stage: This encompasses a broad range of sources, including GHG emissions from building operations (energy), maintenance, and replacement which have been included in this assessment; and
- End of Life Stage: The sustainable deconstruction and disposal of the existing building at 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.

Information and data from the Building Lifecycle Report, Building Energy Ratings (BERs) and energy have been utilised for this chapter.

‘Nearly Zero Energy Buildings’ (NZEB) means a building that has a very high energy performance. The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby.

The Non-Domestic Energy Assessment Procedure (NEAP) is Ireland's official methodology for calculating a BER for non-domestic buildings. BER assessors use the NEAP software tool and guidance manuals to publish non-domestic BER certificates and advisory reports and to demonstrate compliance with Part L of the building regulations. The NEAP software calculates the energy consumption and carbon dioxide emissions of a building. It considers space heating and cooling, water heating, ventilation, and lighting information.

Simplified Building Energy Model (SBEMie) or other approved software can be utilised to publish non-domestic BERs and demonstrate compliance with Part L.

Primary energy use and the associated carbon dioxide emissions are calculated using the NEAP and these parameters must not exceed specified target values.

To achieve NZEB compliance for primary energy use, the energy performance coefficient (EPC) of a building must be no greater than the Maximum Permitted Energy Performance Coefficient (MPEPC), which is 1.0.

An acceptable carbon dioxide emissions rate for NZEB compliance is achieved if the calculated carbon performance coefficient (CPC) is no greater than the Maximum Permitted Carbon Performance Coefficient (MPCPC), which is 1.15.

In terms of reporting units, all units are in equivalent kilogrammes of carbon dioxide – hereafter kg CO2eq. Equivalent kilograms of carbon dioxide (kg CO2eq) are used as a standardised unit for numerous GHGs such as methane and nitrous oxide. Summary data is presented as tonnes of CO2eq for ease of reference of this data.

The Dwelling Energy Assessment Procedure (DEAP) is used by BER assessors to calculate the energy performance and carbon dioxide emissions of a home's space heating, water heating, ventilation, and lighting. DEAP consists of a software tool and guidance manuals. BER Assessors use DEAP to publish BER certificates and advisory reports for homes. DEAP is also the compliance tool specified in Part L of the Irish Building Regulations.

The DEAP software is web-based and used to calculate the annual delivered energy consumption, primary energy consumption (kWh/$m^2$/year) and carbon dioxide emissions ($kgCO_2/m^2/y$) for standardised occupancy. For all new builds, NZEB is equivalent to a 25% improvement in energy performance on the 2011 Building Regulations. Key changes to Part L for NZEB compliance include a Maximum Energy Performance Coefficient of 0.3, a Maximum Carbon Performance of 0.35 and a renewable Energy Ratio of 20%.

The project design team have also utilised the Irish Green Building Councils (IGBC) Carbon Designer tool for Ireland. The Irish Green Building Council, in collaboration with One Click LCA Ltd., have developed the Carbon Designer for Ireland tool specifically for Irish building projects.

Endorsed by the EPA and the LDA, this tool is compliant with standards such as EN 15978, ISO 21931–1, ISO 21929, and the data requirements of ISO 14040 & EN 15804. It is also aligned with LEED, BREEAM, and PAS 2080.

The tool enables users to evaluate the carbon footprint of buildings in the early stages by using typical default materials and values. Users input details such as gross floor area, number of stories, and building frame type. After establishing a baseline with generic data, the tool facilitates the exploration of various options and the optimisation of carbon impacts. It identifies the most carbon-intensive elements within the building and suggests alternatives with lower carbon footprints. This provides a high-level initial assessment of the lifecycle carbon for the development based on basic information and default values with the option to edit these defaults as required to reduce impacts.

The primary factor in reducing climate effect is the extent of proposed mitigation. Thus, using construction materials with lower carbon intensity can help reduce climate effects. This

assessment aims not for perfection but to identify areas with significant carbon impact. We can then explore potential mitigation measures to reduce this effect. Outputs from the IGCB tool have been reviewed and implemented where relevant to reduce the climate effect of the Proposed Development.

Transport Infrastructure Ireland's (TII) proprietary carbon tool has been used to quantify carbon emissions from non-building elements such as material delivery, spoil removal, roads, and infrastructure. 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 of this EIAR.

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, as no specific suppliers have been selected at this early stage of the Proposed Development. This allows for an estimate of transport emissions, using an emissions factor for kg $CO_2$eq/km in the carbon tool.

The use of the TII Carbon Tool was not considered suitable for the building elements of the Proposed Development. 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. These material types are not fully appropriate for assessing the embodied carbon associated with the construction of buildings. Therefore, the carbon impact of the buildings was carried out using an alternative tool, the Carbon Designer for Ireland tool. The IGBC tool in combination with BER/NEAP assessments have been used for the building and operational carbon assessment.

#### *9.6.4.3 GHG Appraisal Method - Operational Phase*

**9.6.4.3.1** 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. Thereafter the effect of the Proposed Development on climate is determined. Emissions from road traffic associated with the Proposed Development have the potential to emit carbon dioxide ($CO_2$) which will affect 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 Development 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 Annual Average Daily Traffic (AADT);

- A change of more than 10% to the number of heavy-duty vehicles; or
- A change in daily average speed of more than 20 km/hr.

None of the road links impacted by the Proposed Development satisfy the above criteria and a quantitative assessment of the effect of traffic emissions on climate has thus been scoped out as there is no potential for significant effects to climate as highlighted within the Transport and the Traffic and Transport Assessment (NRB Consulting Engineers Ltd, 2025).

#### **9.6.4.3.2** 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, ISEP guidance note on 'Assessing Greenhouse Gas 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.

The Climate Action Energy Statement prepared by Axiseng (2025), Building Lifecycle Report (Aramark; 2025) and IGBC outputs in relation to this assessment have been reviewed and used to inform the operational phase climate assessment. This report outlines several measures in relation to energy usage from the Proposed Development primarily in relation to heat and electricity. Several measures have been incorporated into the overall design of the Proposed Development to reduce the effect to climate where possible, in line with the objectives of the ISEP guidance (2022).

### *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 residential sector which remain the same under CAP25 (DECC, 2021). These ceilings will allow a comparison with the net $CO_2$ 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"; and
- "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 Proposed Development has been evaluated using the recommended ISEP significance determination approach. This evaluation accounts for any embedded or planned mitigation measures included in the Proposed Development 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 project in this assessment is based on the criteria presented in Table 9-1 as guided by ISEP in addition to the following two factors:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland's GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

*Table 9-1 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 9-3).

#### *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 effect of the identified risks.

Any assessment of risk includes assessing the likelihood (or probability) and magnitude (or severity) of the effects 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 effect 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 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; and
- **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 following criteria:

- **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; and
- **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; and
- **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.

***Vulnerability = Sensitivity x Exposure***

The vulnerability assessment takes any proposed mitigation into account. Table 9-2 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. In such cases, the effect 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 9-2 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 effect 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, detailed in Section 9.9, 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 was scoped out.

While a CCRA for the construction phase was not required, best practice mitigation against climate hazards is still recommended in Section 9.10.

### 9.6.5 Consultation

The overall project stakeholder and public consultation undertaken in respect of the proposed development is submitted under separate cover to this submission.

Two pre-application meetings were held with GCC to explain the Proposed Development and present technical and environmental information. Summary information in respect of these are provided by Thornton O'Connor Town Planning in their enclosed Planning Report and Statement of Consistency and Statement of Response to LRD Opinion.

## 9.7 Receiving Environment

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 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 $CO_2$, has been and remains a major contributor to this enhanced greenhouse effect. The most critical GHGs include $CO_2$, methane ($CH_4$), and nitrous oxide ($N_2O$).

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 GHGs 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 effects are evaluated at a national level, considering national targets and sectoral emission ceilings. The study area for climate assessments is the Republic of Ireland (the state), 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, 2024).

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 9-3 (EPA, 2024). Climate effects 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 the residential sector accounted for 5.3 million tonnes of carbon dioxide equivalency emissions in 2023.

*Table 9-3 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 $CO_2$eq/person in 2022 to 10.34 tonnes $CO_2$eq/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 $CO_2$eq annually.

The EPA also publishes GHG emission projections to 2055. Table 9-4 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 9-4 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 |

### 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). 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 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 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 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

Effects 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 effects 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 effects 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. While there is a weather station at Athenry the Met Éireann weather station at Shannon Airport, County Clare, 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 Eireann, 2023). The monitoring station is located approximately 64km south of the Proposed Development at its nearest point. Meteorological data recorded at Shannon over the 30-year period from 1991 to 2020 indicates that the wettest months were November and December, and the driest month on average was April. July was the warmest month with a mean temperature of 19.5°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, and Storm Ophelia in October 2018. Shannon also recorded a 10-minute mean wind speed of 61kts, it's highest since records began in 1945.

Annual rainfall from 1991 to 2020 was 9% higher compared to the 30-year period from 1961 to 1990. 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 and winter of 2023 throughout Galway City. 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 Eireann, 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 Eireann, 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 Eireann, 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 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.

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. 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 project

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".*

If the Proposed Development does not proceed, future baseline conditions have been evaluated. In the "do-nothing" scenario, there will be no construction activities or related GHG emissions. However, potential reductions in GHG and local benefits like energy-efficient homes, new roads, and biodiversity improvements will also be lost.

## 9.8 Climatics Multi-Climate Hazard Analysis for (53.2689, -9.05152)

We combine the global data from multiple IPCC models (ACCESS, GFDL-ESM4, HadGEM) to address the model uncertainty. Table 9-5 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.

Under each scenario, nine categories of climate risk indices (20+ hazards) were assessed. The findings and recommendations are summarised in table 9-5. 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. Definitions for the derived hazards are summarised in the table 9-5.

*Table 9-5 Assessment of Climate Risk Indices*

| Category | Hazard | Summary of Findings |
|---|---|---|
| Temperature related indices | Surface temperature | **Mean Temperature**<br><br>The historic mean annual temperature in the area is 9.70°C. This is projected to increase to 10.57°C (+0.87°C) under SSP1-2.6 (optimistic) and 11.06°C (+1.36°C) under SSP5-8.5 (business as usual or pessimistic scenario) for 2050. |
| | Warm Days | **Warm Days**<br><br>Warm days are defined as when the maximum temperature is beyond 90% percentile. The historic warm days in the area are 13.05% per year and this it projected to increase to 25.14% under SSP1-2.6 and 30.12% under SSP5-8.5 scenarios for 2050. |
| | Fire Weather Days | **Fire Weather Days**<br><br>The historic fire weather days in the area were 20.53 days per year. This is predicted to increase to 25.66 (+24.98%) days under SSP1-2.6 and 32.75 (+59.51%) days under SSP5-8.5 for 2050. |
| | Heat Stress Index | **Heat Stress Index**<br><br>The historic heat stress index in the area is 12.48. And this is projected to increase to 13.63 under SSP1-2.6 and 14.14 under SSP5-8.5 scenarios for 2050. |
| Rainfall related extremes | Precipitation | **Precipitation**<br><br>Historic average precipitation in the area was 1250.83 mm/year. This is projected to decrease to 1244.98 mm/year under SSP1-2.6 and 1249.70 mm/year under SSP5-8.5 for 2050. |
| | Heavy Precipitation Days | **Heavy Precipitation Days**<br><br>Precipitation over 10mm is defined as heavy precipitation. The historic average heavy precipitation days in the area was 34.50 days in a year. This is projected to increase to 35.52 days under SSP1-2.6 and 36.35 days under SSP5-8.5 for 2050. |
| | Extreme Precipitation Days | **Extreme Precipitation Days**<br><br>Precipitation over 99% quantile is defined as extreme precipitation. The historic average extreme precipitation is 77.14 mm for a year and this is projected to increase to 93.04 mm (+20.61%) under SSP1-2.6 and 104.06 mm (+34.89%) under SSP5-8.5 for 2050. |
| | Flood Events | **Flood Events**<br><br>The historic inundation of 100-yr flood event is 0.10 m. This is projected to increase to 0.12 m (+22.84%) |

| Category | Hazard | Summary of Findings |
|---|---|---|
| | | under SSP1-2.6 and 0.12 m (+28.58%) under SSP5-8.5 for 2050. |
| Aridity/Drought conditions | Water stress | **Water Stress**<br><br>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. |
| Irradiance at surface | Surface reading solar radiation | **Surface Reaching Solar Radiation**<br><br>The surface reaching solar radiation in the area was historically 116.54 W/m² and this is projected to increase to 121.63 W/m² under SSP1-2.6 and 120.13 W/m² under SSP5-8.5 for 2050. |
| Cloud related | Cloud cover | **Cloud Cover**<br><br>Historic average cloud cover in the area was 80.57%. This is projected to decrease to 80.33% (-0.25%) under SSP1-2.6 and 79.47% (-1.10%) under SSP5-8.5 for 2050. |
| Wind extremes | Wind speed | **Wind Speed**<br><br>Historic average wind speed in the area was 5.15 m/s. This is projected to be 4.92 m/s under SSP1-2.6 and 5.02 m/s under SSP5-8.5 for 2050. |
| | Storm wind speed | **Storm Wind Speed**<br><br>The historic storm wind speed of the area is 16.79 m/s and this is predicted to be increase to 18.65 m/s (+11.08%) for SSP5-8.5 scenario for 2050. |
| Landslide | Landslide | **Landslide**<br><br>The historic landslide in the area is 0 indicating minor impact from landslide events. Low risk |
| Hailstorm | Hailstorm frequency | **Hailstorm Frequency**<br><br>Historical hailstorms in this location were 0.00 events/year. This denotes that the hailstorm has minimal impact in this area which is ideal for a storage unit. |
| Lightning | Lightning density | **Lightning Density**<br><br>The historic lightning density in the area was smaller than 0.04 event per year. It indicates a minor impact from lightning events. |

## 9.9 Potential Effect of the Proposed Development

During both the construction and operational phases of the Proposed Development, there is potential for various GHG 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.

### 9.9.1 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.

The project design team have also utilised the Irish Green Building Councils (IGBC) Carbon Designer tool for Ireland. This provides a high-level initial assessment of the lifecycle carbon for the development based on basic information and default values with the option to edit these defaults as required to reduce effects.

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 effect. Where possible demolished materials should be re-used on site or sent to a suitably licenced waste facility for re-use on other sites;
- 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/Construction 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;
    - Construction activities covers carbon emissions generated during the construction of the Proposed Development based on the scale and duration of the Proposed Development; 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).

- Material replacement & refurbishment: Ongoing material refurbishment and replacement throughout the lifetime of the development is included within this stage of the GHG assessment these are default values based on the typical maintenance requirements for the chosen material types over the assumed 50-year lifetime

The results of the assessment of the above stages using the TII and IGBC tools are presented in Table 9-6 and Figure 9-5. The results indicate that the total GHG emissions generated as a result of the construction of the Proposed Development are 14,423 tonnes CO2eq.

The carbon assessment has identified hotspots for embodied carbon emissions, particularly those associated with building materials. These emissions have been calculated using standard default materials for different building types within the OneClick tool, as detailed material information was not available at this stage of the Proposed Development. Additionally, the average material types from the TII Carbon Tool were utilised for this assessment due to the lack of more specific information.

As anticipated, construction materials represent the largest portion of carbon emissions for the Proposed Development; constituting about 83% of the total embodied carbon emissions during the construction phase across the different buildings. The highest carbon impact is observed in the external walls, beams, floors, and roofs, based on the standard default values and assumptions used in the carbon calculations. The rest of the construction phase's embodied carbon emissions come from transportation to the site, site operations, and material replacement.

The total embodied carbon for the construction phase, including the maintenance and replacement of materials throughout the development's lifetime, has been calculated at 14,423 tonnes CO2e (see Table 9-6). Since the overall GHG emissions from the 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 Buildings (Residential), Transport, 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 9-6 Construction Phase Greenhouse Gas Emissions*

| Stage | GHG Assessment Category | Predicted GHG Emissions ($tCO_2e$) | Relevant Sector for Cabron Budget Comparison | Annualised GHG Emissions as % of Relevant Cabron Budget |
|---|---|---|---|---|
| **Production Stage** | Materials | 12,012 | Industry | 0.006006% |
| **Transportation to site** | Material Transport | 394 | Transport | 0.000131% |
| **Site Operations/ Construction activities** | Clearance and demolition | 1 | Industry | 0.000000% |
| **Site Operations/ Construction activities** | Excavation | 10 | Industry | 0.000005% |

| Stage | GHG Assessment Category | Predicted GHG Emissions ($tCO_2e$) | Relevant Sector for Cabron Budget Comparison | Annualised GHG Emissions as % of Relevant Cabron Budget |
|---|---|---|---|---|
| **Site Operations/ Construction activities** | Construction Worker Travel to Site | 18 | Transport | 0.000006% |
| **Site Operations/Construction activities** | Construction Fuel Use | 628 | Industry | 0.001256% |
| **Site Operations/ Construction activities** | Construction Waste Disposal | 19 | Waste | 0.000006% |
| **Site Operations/ Construction activities** | Construction Waste Transport | 364 | Transport | 0.000121% |
| **Material replacement & refurbishment** | Maintenance Material | 978 | Industry | 0.000489% |
| **Total** | | 14,423 $tCO_2e$ | | |

Note 1 Project lifespan assumed 50 years for calculation purposes in line with best practice

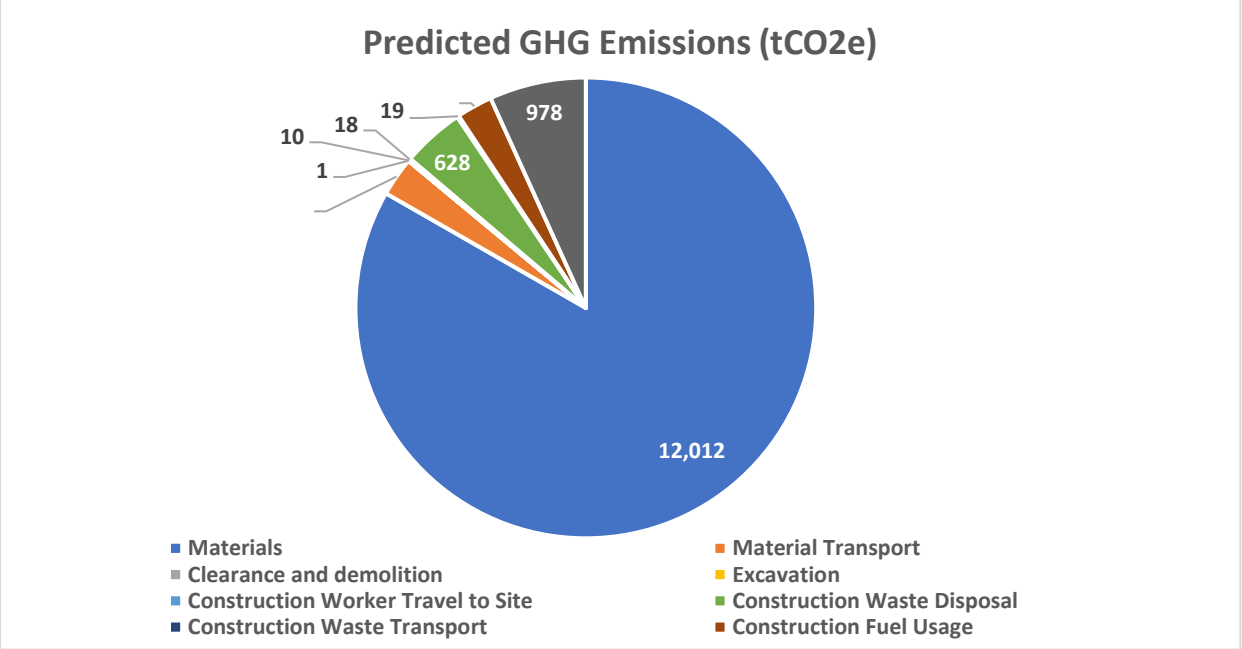



*Figure 9-5 Construction Categories Greenhouse Gas Emissions $tCO_2e$*

The projected GHG emissions (outlined in Table 9-7) 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 9-7 compares these GHG emissions with the 2030 carbon budgets for the industry, and waste sectors, Ireland's total GHG emissions for 2023, 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 GHG emissions amount to 0.0005% of Ireland's total GHG emissions in 2023 and 0.0009% of Ireland's non-ETS 2030 emissions target. Specifically, construction waste emissions represent 0.028% of the Waste budget, and industry-related emissions comprise 0.007% of the 2030 Industry budget.

*Table 9-7 Estimated Construction GHG Emissions relative to Sectoral Budgets and GHG Baseline*

| Target/Sectoral Budget ($tCO_2e$) | | 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 | 0.0005% |
| **Non-ETS 2030 Target** | 33,381,312 | Total GHG Emissions | 0.0009% |
| **(Industry Sector) 2030 Sectoral Budget** | 4,000,000 | Total Industry Emissions | 0.0072% |
| **(Transport Sector) 2030 Sectoral Budget** | 6,000,000 | Total Transport Emissions | 0.0048% |
| **(Waste Sector) 2030 Sectoral Budget** | 1,000,000 | Total Waste Emissions | 0.0288% |

#### *9.9.1.1 Effect 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 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 of 2026, 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 (Hydrology and Hydrogeology). Flood risk measures and extreme weather considerations have been integrated into the construction planning process. TOBIN (2025) conducted an FRA for the Proposed Development.

##### 9.9.1.1.1 Fluvial Flooding

The River Corrib, which is located approximately 500m west of the subject site was studied as part of the Western Catchment-based Flood Risk Assessment and Management (CFRAM) Study. The mapping shows that in a 1 in 1000-year (0.1% Annuel Exceedance Probability (AEP)) Mid-Range Future Scenario (MRFS) event, the fluvial flood extents are at minimum 120m southwest of the subject site.

Therefore, the risk of fluvial flooding to the subject site is minimal.

#### 9.9.1.1.2 Coastal Flooding

National Coastal Flood Hazard Maps (NCFHM) mapping indicates that in a current scenario approximately 25% of the subject site is inundated in a 1 in 1000-year (0.1% AEP) event, with a small area liable to coastal flooding in a 1 in 200-year (0.5% AEP) event. The NCFHM mapping indicates that in a current scenario approximately. The area prone to flooding is the southwestern portion of the subject site. In the MRFS approximately half of the subject site is inundated in a 1 in 200-year (0.5% AEP) event, with approximately 60% of the subject site inundated in a 1 in 1000-year (0.1% AEP) event. Again, the southwestern portion of the subject site is the area which is at risk of coastal flooding. There are two small areas of the subject site which are liable to flooding in the 1 in 10-year (10% AEP) event; along the southeastern and southwestern borders. The ICWWS water levels in a 1 in 200- and 1 in 1000-year (0.5% and 0.1% AEP) MRFS event area 4.51mOD and 4.76mOD respectively. The CFRAM mapping showed lesser extents but uses the superseded ICPSS coastal water levels.

In order to defend the subject site against a 1 in 1000-year (0.1% AEP) MRFS flood event, which is required for critical infrastructure, the FFL at the subject site is required to be at minimum 5.05mOD to account for climate change plus a freeboard of 300mm.

Therefore, it is estimated that risk of coastal flooding associated with the Proposed Development is minimal.

#### 9.9.1.1.3 Pluvial Flooding

The FRA indicative mapping indicates that there are no areas of pluvial flooding within the subject site. Surface water arising on the proposed mixed-use development will be managed by a dedicated stormwater drainage system in accordance with Sustainable Drainage Systems (SuDS) principles, limiting discharge from the site to greenfield runoff rates.

The landscaping and topography of the developed site will provide safe exceedance flow paths and prevent surface water ponding to minimise residual risks associated with an extreme flood event or a scenario where the stormwater drainage system becomes blocked. Therefore, it is estimated that risk of pluvial flooding associated with the Proposed Development is minimal.

#### 9.9.1.1.4 Groundwater Flooding

There is no evidence to suggest groundwater as a potential source of flood risk to the proposed subject site.

#### 9.9.1.1.5 Justification Test

The Proposed Development was subject to the Justification Test as portions of the site are located in Flood Zone B. The Proposed Development satisfied all criteria of the Justification Test. Based on the results of this flood risk assessment (TOBIN, 2025), it is estimated that the risk of flooding to the Proposed Development will be minimal, and that the development will not increase the risk of flooding elsewhere. There is an evident coastal risk at the southwestern portion of the subject site. TOBIN (2025) proposes to mitigate the flood risk to “Highly vulnerable” infrastructure by raising the minimum FFL to 5.05m Ordnance Datum (OD), this allows for a 300mm freeboard above the 1 in 1000-year (0.1% AEP) MRFS event.

### 9.9.2 Operational Phase

#### *9.9.2.1 Operational Effects*

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 effects 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 the Proposed Development. Therefore, the effect will be long-term, localised, neutral, and imperceptible.

There is the potential for a number of GHG emissions to the atmosphere during the operational phase of the development. The main sources of GHG emissions from the operational stage of the development arise from heating, domestic hot water, and lighting. The proposed development will introduce sustainable and renewable energy technology to the development. Ongoing maintenance of the Proposed Development materials has been accounted for within Section 9.10.1 above. The following section outlines the effect of operational energy use on GHG emissions.

There is also the potential for increased traffic volumes to impact climate. The change in AADT values is not of the magnitude to require a detailed climate assessment as per the DMRB screening criteria outlined in Section 9.6.3 (UK Highways Agency, 2019b). It can therefore be determined that traffic related $CO_2$ emissions during the operational phase are long-term, localised, neutral and imperceptible.

The Proposed Development has been designed to reduce the effect to climate where possible. A number of measures have been incorporated into the design to ensure the operational phase emissions are minimised. These are outlined fully within the Climate Action and Energy Statement, Axiseng (2025) and are summarised below.

The Proposed Development will be a NZEB in accordance with the Part L 2021 requirements. Each building will have a BER that will comply with the Part L requirements. The following measures, or similar will be incorporated into the Proposed Development to achieve a more energy efficient (i.e. less carbon intensive) design. All measures will be reviewed at the detailed design stage and the most appropriate options will be implemented.

- The development will be in compliance with the requirements of the Near Zero Energy Building (NZEB) Standards;
- EU Taxonomy alignment with 10% lower than NZEB;
- A renewable energy rating (RER) of 20% will be achieved to comply with Part L (2021) of the NZEB regulations;
- A Building Energy Rating (BER) of A2/A3 is being targeted;
- Low U-values either matching or exceeding TGD L 2022 minimum elemental U-values;
- Air permeability target of 3m3 /hr/m2 @ 50Pa in line with industry norms;
- Variable Refrigerant Flow (VRF) system serving all occupied areas with an SCOP of 3.50 and SEER of 4.50;
- Local mechanical ventilation with plate heat exchanger heat recovery with an efficiency of 80%;
- Low specific fan power values of 1.6 W/l/s on local Mechanical Ventilation and Heat Recovery (MVHR);
- LED lighting with an efficacy of 130Lm/W; and

- High Temperature heat pump for Domestic Hot Water production for each unit.

It is proposed to incorporate bicycle and electric vehicle parking spaces within the Proposed Development to promote the use of sustainable transport. Overall, these measures will aid in reducing the effect to climate during the operational phase of the Proposed Development. Full descriptions of the measures proposed, and their benefits are outlined within the submitted planning application materials.

In Table 9-8, operational GHG emissions have been compared against the carbon budget for the residential sector in 2030, against Ireland's total GHG emissions in 2023 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 0.0006% of Ireland's total GHG emissions in 2023 and 0.0012% of Ireland's non-ETS 2030 emissions target. The total GHG emissions associated with residential-related activities are 0.0017% of the 2030 residential budget.

*Table 9-8 Estimated Operational GHG Emissions relative to Residential Budget and GHG Baseline*

| Target/Sectoral Budget ($tCO_2e$) | | 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 | 0.0006% |
| **Non-ETS 2030 Target** | 33,000,000 | Total GHG Emissions | 0.0012% |
| **(Residential Sector) 2030 Sectoral Budget** | 5,753,000 | Total Industry Emissions | 0.007% |

### 9.9.3 GHGA Significance of Effects Construction & Operational Phases

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 project 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 9.6.4.4 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 in EIA terms.

### 9.9.4 Climate Change Risk Assessment

#### *9.9.4.1 Construction Phase*

A detailed CCRA of the construction phase has been scoped out, as discussed in Section 9.6.4.5, which states 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 9.8:

- Flood risk due to increased precipitation, and intense periods of rainfall. This includes fluvial and pluvial flooding;
- Increased temperatures potentially causing drought, wildfires, and prolonged periods of hot weather;
- Reduced temperatures resulting in ice or snow;
- Geotechnical impacts; and
- Major Storm Damage - including wind damage.

#### *9.9.4.2 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. 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 9-9 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 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.

*Table 9-9 Climate Change Vulnerability Assessment*

| Climate Hazard | Sensitivity | Exposure | Vulnerability |
|---|---|---|---|
| Flooding (Coastal, Pluvial, Fluvial) | 1 (Low) | 2 (Medium) | 2 (Low) |
| Extreme Heat | 1 (Low) | 1 (Low) | 1 (Low) |
| Extreme Cold | 1 (Low) | 1 (Low) | 1 (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 CCRA unnecessary.

The FRA conducted by TOBIN (2025) indicates that the site is partly located within Flood Zone B. The primary flood risk for the Proposed Development is coastal flooding due to its proximity to the Galway Bay and the River Corrib whereby 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. The CFRAM flood maps for the site do not indicate any risk of fluvial flooding. The Office of Public Works (OPW) documents several past flood events in the vicinity of the subject site. All flood events are as a result of coastal/estuarine waters. The closest recorded flood event to the subject site is approximately 300m west of the subject site, on the opposite side of the Galway Docks. Therefore, the numerous flood events are not expected to impact the subject site (TOBIN, 2025).

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 pluvial flooding have been 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 pluvial flood risk at the site. The design accommodates flows in peak rainfall events, and the drainage system has sufficient capacity to accommodate a 1 in 100 Year plus 30% Climate Change event below ground without flooding any of the paved surfaces.

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 can last for weeks or months. The FRA has determined that the Proposed Development is not at risk of groundwater flooding.

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 Proposed Development 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 Proposed Development'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 building 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.

#### *9.9.4.3 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 effects of climate change on the development are considered ***direct, long-term, negative, and imperceptible***, and are therefore not deemed significant in EIA terms.

### 9.9.5 Potential Cumulative Effects

Regarding the requirement for a cumulative assessment, TII PE-ENV-01104 (2022) indicates that *"since the GHG assessment pertains to global climate and the effects 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 Proposed Development in relation to its alignment with Ireland's trajectory towards net zero and sectoral carbon budgets, this assessment will demonstrate the Proposed Development'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 Proposed Development’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 Proposed Development’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 effects result from the combined effects of the Proposed Development alongside other existing or planned developments in the area. These effects 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.

#### *9.9.5.1 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, ensuring alignment with regional and national climate targets, and adhering to the principles of the EU Taxonomy and NZEB standards. Nearby emissions sources include commercial/residential buildings, vehicles and from Galway Port operations.

**Water Resources and Flooding**

ISEP (2022) stresses the importance of considering cumulative effects 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 SUDS, as are proposed.

**Biodiversity and Habitat Loss**

Cumulative effects 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 effects on ecosystems and species. The fragmentation of habitats and disruption of ecological networks can accelerate species decline and reduce ecosystem resilience. To mitigate these effects, 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 effects 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 will ensure that air quality management plans are in place and that mitigation measures are designed to minimise emissions, particularly in urban areas where cumulative effects are more likely to be significant.

**Soil Degradation and Erosion**

Cumulative effects 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 construction activities can lead to accelerated soil erosion, reduced fertility, and increased sedimentation in water bodies. Sustainable land management practices, including erosion control measures and soil conservation techniques, will be integrated into the development to mitigate these cumulative effects.

**Infrastructure and Energy Demand**

ISEP's guidance emphasises the importance of considering the cumulative effects 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 does promote energy efficiency, the use of renewable energy sources, and the integration of smart grid technologies to ensure that infrastructure can accommodate future energy needs without compromising climate goals.

### 9.9.6 Mitigation and Monitoring

In accordance with ISEP guidance (2022), addressing cumulative effects 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 effects early and to adjust mitigation measures as necessary to minimise long-term environmental and climate-related risks.

By considering cumulative effects 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.

### 9.9.7 "Do Nothing" Effects

Under the Do-Nothing Scenario no construction works will take place and the previously identified effects of carbon emissions from equipment, machinery and development operation will not occur. Therefore, this scenario can be considered neutral in terms of climate.

## 9.10 Avoidance, Remedial & Mitigation Measures

### 9.10.1 Construction Phase

Embodied carbon of materials and construction activities is the primary source of climate effects during the construction phase. The Resource Waste Management Plan prepared by AWN Consulting Ltd (2025) which accompanies this planning application details a number of measures to reduce the embodied carbon of the demolition works. Further pre-construction carbon Avoidance, Remedial & Mitigation Measures include:

**Design for Performance**

- Require a Design for Performance approach from design teams and contractors; and
- Include contractual targets for whole life carbon with a focus on Net Zero and nature-positive goals where possible.

**Circularity in Design**

- Require design teams to develop a circularity concept for projects, focusing on adaptability, disassembly, and reuse; and
- Set a target for a percentage of reused and recycled materials in designs.

**Building Lifecycle Report**

- Ensure the building lifecycle report is regularly reviewed and updated in line with current policy and best practice for sustainable construction.

**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.

**Building Renovation Passports (BRPs)**

- Request Building Renovation Passports for this asset as part of the roadmap to decarbonise each asset.

**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.

**European Framework for Sustainable Buildings**

- Commit to using key indicators from the European Framework for sustainable buildings, Level(s), with support from the IGBC; and
- Focus on indicators such as Life Cycle Assessment (LCA), Life Cycle Cost (LCC), Indoor Air Quality (IAQ), and Circularity.

**Energy and Carbon Performance Reporting**

- Plan to disclose the operational energy and carbon performance of the Proposed Development in your annual reporting.

**Post-Occupancy Evaluation**

- Allow for post-occupancy evaluation of completed developments to ensure feedback is passed to the design team.

**Demolition and Construction Waste Management**

- Create a demolition and construction programme allowing sufficient time to determine reuse and recycling opportunities for demolition waste;
- Appoint a competent demolition contractor to undertake a pre-demolition audit detailing resource recovery best practice and identifying materials for reuse and recycling; and
- Reuse materials on site in the new build areas where possible.

**EU Taxonomy Compliance**

- Commit to complying with EU taxonomy requirements on the circular economy, specifically reuse, recycling, and material recovery of demolition and construction waste; and
- Review and ensure compliance with the EU Taxonomy Regulation (EU) 2020/852 regarding circular economy practices for demolition and construction waste.

**Local Material Sourcing**

- Source materials locally where possible to reduce transport-related $CO_2$ emissions.

**Building Certifications**

- Aim for building certifications such as Home Performance Index (HPI), Leadership in Energy and Environmental Design (LEED), or equivalent, to ensure sustainable and high-performance standards are met throughout the Proposed Development.

The LDA has published its Sustainable Development Strategy, which sets out a roadmap for the organisation to achieve its ambition of maximising the supply of affordable and social homes while mitigating environmental effects and boosting biodiversity gains.

The LDA has identified six strategic objectives – with a near to medium term focus on mitigating carbon effect and focusing on the potential for BNG across the LDA portfolio. The strategic objectives of the LDA are to:

- Reduce Carbon (Embodied and Operational);
- Promote Water Stewardship;
- Optimise Sustainable Land-Use and Mobility;
- Enhance Biodiversity & Climate Resilience;
- Promote Circularity; and
- Support the Creation of Social Value.

Regarding the Proposed Development's resilience to climate change, the Contractor will be required to mitigate the effects of extreme weather, such as heavy rainfall, flooding, windstorms, and temperature fluctuations, through site risk assessments and method statements. Additionally, certified datasheets for construction materials will outline their operational temperature limits, ensuring that temperature-sensitive materials perform adequately. The Contractor will also address risks associated with fog, lightning, and hail through appropriate risk assessments and mitigation plans.

During the construction phase the following best practice measures shall be implemented on site to prevent significant GHG emissions and reduce effects to climate:

- **Energy-Efficient Equipment:** Use energy-efficient machinery and equipment on-site. Regular maintenance and proper operation can also help reduce fuel consumption and emissions;

- **Renewable Energy:** Incorporate renewable energy sources, such as solar panels, to power construction activities. This can significantly reduce reliance on fossil fuels;
- **Reduce Idling**: Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods;
- **Sustainability Awareness**: Ensure that sustainability and carbon specifically is incorporated into site team talks, construction and reporting targets. Integrate training clauses for contractors and sub-contractors to upskill their onsite personnel including sub-contractors in low energy construction skills. Appoint sustainability champions to ensure that the Proposed Development continues to perform in a sustainable manner;
- **Sustainable Transportation**: Encourage cycle/walking, carpooling, use of public transportation, or electric vehicles for workers commuting to the site;
- **Monitoring and Reporting:** Regularly monitor and report GHG emissions from the construction site. This helps in identifying areas for improvement and ensuring compliance with environmental standards Sustainability spot checks should be added to ongoing site inspections and feedback shared with all onsite to ensure measures are being adopted;
- **Maintenance**: Ensure all plant and machinery are well maintained and inspected regularly;
- **Waste Management:** Implement a robust waste management plan to reduce, reuse, and recycle construction waste. Proper waste management can significantly cut down on emissions Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site. Application of the waste hierarchy to all waste material generated; and
- **Sustainable Procurement:** Sourcing low carbon materials locally where possible to reduce transport related $CO_2$ emissions.

### 9.10.2 Operational Phase

A number of measures have been incorporated into the design of the development in order to mitigate against the effects of future climate change. For example, adequate attenuation and drainage have been incorporated into the design of the development to avoid potential flooding effects 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 9.7.3).

The Proposed Development has been designed to reduce the effect on climate as a result of energy usage during operation. The building lifecycle report (Aramark; 2025) submitted under separate cover with this planning application details a number of incorporated design mitigation measures that have been incorporated into the design of the development to reduce the effect on climate wherever possible.

Such measures included in the Proposed Development to reduce the effect to climate from energy usage are:

- The development will be in compliance with the requirements of the NZEB Standards;
- EU Taxonomy alignment with 10% lower than NZEB including landlord spaces;
- A renewable energy rating (RER) of 20% will be achieved to comply with Part L (2021) of the NZEB regulations;
- A Building Energy Rating (BER) of A2 is being targeted;

- Low U-values either matching or exceeding TGD L 2022 minimum elemental U-values
- Air permeability target of 3m3 /hr/m2 @ 50Pa in line with industry norms;
- Variable Refrigerant Flow (VRF) system serving all occupied areas with an SCOP of 3.50 and SEER of 4.50;
- Air source heat pumps in residential units and variant refrigerant flow air-conditioning with heat recovery for commercial units;
- Local mechanical ventilation with plate heat exchanger heat recovery with an efficiency of 80%;
- Low specific fan power values of 1.6 W/l/s on local MVHR;
- LED lighting with an efficacy of 130Lm/W. Presence detection in circulation areas and locally controlled in residential apartments and student bedspaces;
- High Temperature heat pump for Domestic Hot Water production for each unit; and
- Green roof systems.

In addition, the development has been designed with a focus on low carbon design. Electric vehicle and bicycle parking will be provided within the development which will promote the use of more sustainable modes of transport and reduce potential transport emissions. Full descriptions of the measures proposed, and their benefits are outlined within the Building Lifecycle Report submitted with this application.

## 9.11 Risk of Major Accidents or Disasters

As detailed in Section 9.6.4 and Chapter 15 (Risk), 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 effect is considered direct, long-term, negative, and imperceptible, and is therefore not deemed significant in terms of the EIA.

## 9.12 Worst Case Scenario

Worst case estimates have been used as part of this assessment. As a result, Section 9.11 details the worst-case effect for the Proposed Development.

## 9.13 Monitoring

### 9.13.1 Construction Phase

The following monitoring strategies will be implemented to ensure compliance with the environmental objectives outlined in this EIA. These strategies are essential for effectively managing the environmental effects associated with the demolition and construction phases, with a particular focus on resource recovery, waste management, and the reduction of GHG emissions.

**Monitoring of Demolition Waste Reuse and Recycling**

To optimise the reuse and recycling of demolition materials, the following will be implemented:

- Material Reuse Tracking System: A digital tracking system 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;

- Weekly Progress Reports: The demolition contractor will be required to submit weekly progress reports. These reports shall provide detailed metrics on the volumes of materials recovered, reused, and recycled, alongside any challenges encountered. This approach will allow for the early identification of issues and timely adjustments to the recovery plan; and
- Regular On-Site Inspections: Regular inspections to verify that materials earmarked for reuse are being properly stored and handled. These inspections shall ensure that materials remain in suitable condition for their intended use in the new build areas.

**Competency and Performance of Demolition Contractor**

To ensure that the demolition process aligns with the Proposed Development's environmental goals, the following monitoring measures will be implemented:

- Verification of Pre-Demolition Audit: The pre-demolition audit conducted by the appointed contractor shall be thoroughly reviewed to confirm that all materials and components suitable for reuse or recycling have been accurately identified. This review will ensure that the audit reflects best practice in resource recovery; and
- Periodic Contractor Performance Reviews: Periodic performance reviews of the demolition contractor will be conducted. These reviews shall focus on their adherence to the resource recovery plan, the accuracy of material identification, and their overall compliance with project timelines without compromising environmental standards.

**Compliance with EU Taxonomy for Circular Economy**

Given the Proposed Development's commitment to meeting EU taxonomy requirements, the following monitoring measures will be implemented:

- Comprehensive Documentation and Reporting: detailed records that document compliance with the circular economy principles outlined in the EU taxonomy will be maintained. This documentation should include logs of all recycled materials, percentages of materials reused on-site, and detailed descriptions of how circular economy practices are being implemented; and
- Independent Third-Party Audits: An independent auditor will be engaged to periodically assess the Proposed Development's compliance with the EU taxonomy. The audit will verify the accuracy of reported data and ensure that the circular economy requirements are fully adhered to throughout the Proposed Development.

**Monitoring of GHG Emissions Reduction Measures**

To mitigate the Proposed Development's effect on climate change, the following monitoring activities will be applied:

- Appointment of 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: GPS or telematics systems on all vehicles and machinery will be used on-site to monitor engine idling times. Automatic

alerts will 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: Implementation of a digital maintenance log system to track the inspection and maintenance of all on-site equipment. This system will 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 will be developed to track material orders and usage. This system will 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 will be applied:

- Waste Segregation Audits: Regular audits will 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: Monthly reports detailing the volume of waste reduced, reused, and recycled will be generated. These reports will 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 practices will be implemented:

- Supplier Distance Monitoring: A database of suppliers will be developed, documenting the distance of each supplier from the construction site. This database will 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. This analysis will inform the selection of suppliers, with a preference for those within a closer radius to reduce $CO_2$ emissions.

These monitoring measures are designed to ensure that the Proposed Development adheres to its environmental commitments, particularly in the areas of resource recovery, waste management, and GHG 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.

### 9.13.2 Operational Phase

Environmental Management Plan that incorporates adaptive management principles.

Ensure climate change resilience plans are robust; continued monitoring of trends in weather events; and continued review of resilience measures related to interdependencies.

The following monitoring strategies will be applied to ensure that the Proposed Development meets its environmental objectives. These strategies focus on mitigating the effects of climate change, enhancing energy efficiency, and promoting sustainable transport, all of which are aligned with best practices outlined in ISEP guidelines.

**Monitoring of Climate Change Mitigation Measures**

- **Attenuation and Drainage Systems Monitoring**: Consistent with ISEP's guidance on climate resilience (ISEP EIA Guide to: Climate Change Resilience and Adaptation (2020), regular inspections will be undertaken to verify the functionality of the attenuation and drainage systems. These inspections will be conducted during construction, after significant rainfall events, and periodically thereafter to ensure long-term effectiveness in preventing flooding; and
- **Climate Vulnerability Assessment Review**: In accordance with ISEP's recommendation to periodically reassess climate risks, the climate vulnerability assessment (as detailed in Section 9.7.3) will be reviewed at regular intervals. This review will incorporate the latest climate projections to ensure the mitigation measures remain adequate and effective.

**Monitoring of Energy Efficiency and Climate Impact Reduction**

To minimise the effect of the development on climate through energy use during operation, the following monitoring activities will be applied:

- **NZEB Compliance Verification**: Continuous monitoring during the construction phase will ensure that the development complies with the NZEB Standards. This includes verifying that all building components and systems meet the NZEB criteria;
- **EU Taxonomy Alignment Monitoring**: Will ensure that the development achieves energy performance that is at least 10% lower than the NZEB requirements. Regular energy performance assessments will be conducted to confirm alignment with the EU Taxonomy for sustainable development;
- **Renewable Energy Ratio (RER) Compliance**: Monitoring the implementation of renewable energy systems, such as solar panels and air source heat pumps, to ensure that the development achieves a Renewable Energy Ratio (RER) of 20%, in line with Part L (2021) of the NZEB regulations. Post-installation, periodic checks should be performed to verify ongoing compliance;
- **Building Energy Rating (BER) Target Achievement**: Regular energy audits will be carried out to monitor the building's energy performance, ensuring that the targeted Building Energy Rating (BER) of A2/A3 is achieved. This includes verifying the efficiency of insulation, windows, HVAC systems, and other energy-related components; and
- **Thermal Performance Monitoring**: Continuous monitoring during construction will ensure that the building achieves the improved thermal transmittance (U-Values), air permeability, and thermal bridging standards specified in the design. Post-construction thermal imaging surveys and air tightness tests will be conducted to confirm that these standards have been met.

**Monitoring of Renewable Energy Systems**

To ensure the successful implementation and operation of renewable energy systems, the following monitoring measures will be applied:

- **Air Source Heat Pump Performance**: Regular inspections and maintenance checks will be conducted on the air source heat pumps to ensure they are operating efficiently and contributing effectively to the building's energy needs. Performance metrics such as Coefficient of Performance (COP) and Seasonal Performance Factor (SPF) will be tracked and compared against the expected values; and
- **Occupant Sustainability Information**: Consistent with ISEP's emphasis on stakeholder engagement, it is important to ensure that all building occupants receive comprehensive sustainability information. This will include guidance on energy conservation practices and how to use renewable energy systems effectively. Feedback mechanisms, such as surveys, will be used to assess the effect of this information on occupant behaviour.

**Monitoring of Sustainable Transport Initiatives**

To promote sustainable transport and reduce transport-related emissions, the following monitoring strategies will be adopted:

- **Electric Vehicle (EV) and Bicycle Parking Usage**: Regular monitoring will be carried out to assess the usage of electric vehicle charging stations and bicycle parking facilities within the development. This will help gauge the effectiveness of these measures in promoting sustainable transport modes. Usage data can inform whether additional facilities or adjustments are needed; and
- **Transport Emissions Impact Assessment**: Periodic assessments will be conducted to evaluate the effect of the provided sustainable transport facilities on reducing overall transport emissions. This could include monitoring the uptake of electric vehicles by residents and the corresponding reduction in GHG emissions.

These monitoring measures are designed to ensure that the development's climate change mitigation measures, energy efficiency initiatives, 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, energy performance assessments, and occupant engagement will be crucial to achieving the desired environmental outcomes.

## 9.14 Residual Effects

The Proposed Development will result in some effects 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 best practice mitigation measures and is committing to reducing climate effects where feasible, the development will comply with the do-minimum standards set through regulation (NZEB and Part L 2021).

**GHG Assessment:**

- Construction Phase: Residual effects from GHG emissions during construction are considered long-term, minor adverse, and not significant in EIA terms. This determination is based on the best practice mitigation measures proposed and the commitment to minimising climate impact where feasible; and
- Operational Phase: For the operational stage, residual GHG emissions are also classified as long-term, minor adverse, and not significant in EIA terms. These findings reflect the development's alignment with regulatory requirements and the implementation of measures to reduce overall emissions compared to a baseline consistent with a net zero trajectory by 2050.

**Climate Change Resilience and Vulnerability (CRC) Assessment**

Construction Phase: The assessment identifies no significant risks or vulnerabilities to the Proposed Development arising from climate change during the construction phase. The development is not expected to be adversely affected by climate-related events in this period.

Operational Phase: Similarly, for the operational phase, there are no significant climate change vulnerability risks anticipated. The design and mitigation measures ensure that the development is resilient to foreseeable climate impacts over its lifecycle.

In summary, both the GHG and CRC assessments for construction and operational phases conclude that the residual effects are either minor and not significant, or there are no significant risks identified, ensuring the development's compliance with best practice and regulatory standards.

## 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, and transportation, plays 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.

### 9.15.1 Population and Human Health (see Chapter 4)

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, which are addressed in parallel with climate assessment (see Chapter 8);
- Noise and vibration disturbance, particularly in relation to sensitive receptors such as residential dwellings and The Harbour Hotel Galway;

- Green infrastructure and landscaping, which contribute to urban cooling, improved air quality, and enhanced amenity;
- SuDS and water management systems, which reduce flood risk and associated health hazards; and
- Traffic emissions, which were assessed using DMRB LA 114 criteria and scoped out 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.

### 9.15.2 Biodiversity (see Chapter 5)

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:

- Planting of native tree and hedgerow species selected for their adaptability to changing climatic conditions;
- Integration of green infrastructure such as permeable paving, green walls, and pollinator-friendly planting to support ecosystem services;
- 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, urban cooling, and ecological connectivity, enhancing the site's resilience to climate change and supporting long-term biodiversity conservation.

### 9.15.3 Land and Soils (see Chapter 6)

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.

Site investigations have identified elevated concentrations of lead, PAHs, and other contaminants in Made Ground soils. The excavation and removal of impacted soils is a design requirement of the Proposed Development, representing a positive and permanent improvement in soil quality.

The Resource and Waste Management Plan (AWN, 2025) estimates that approximately 16,063 m³ of soil, stones, clay and made ground will be excavated to facilitate construction. Of this, 4,469 m³ is expected to be reused onsite, while 11,594 m³ will be removed offsite for appropriate reuse, recovery, recycling or disposal.

To mitigate climate-related risks such as increased rainfall and potential erosion, the Proposed Development incorporates engineered capping layers in landscaped areas and suspended floor slabs supported by piles. These measures enhance resilience to changing soil conditions and reduce the risk of contaminant mobilisation.

The Construction Environmental Management Plan (CEMP) 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.

### 9.15.4 Hydrology and Hydrogeology (see Chapter 7)

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. Chapter 7 (Hydrology and Hydrogeology) outlines the Proposed Development’s water management strategies, including SuDS, attenuation systems, and flood resilience measures, ensuring robustness against future climate scenarios.

### 9.15.5 Air Quality (see Chapter 8)

Air quality and climate are interrelated due to shared sources of emissions, particularly from the combustion of fossil fuels during both the demolition/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.

### 9.15.6 Material Assets- Traffic and Transport (see Chapter 12)

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 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.

These criteria were applied to both the construction and operational phases of the Proposed Development.

For the construction phase, NRB Consulting Engineers Ltd (2025) confirmed that projected traffic volumes fall below the thresholds set out in TII guidance, based on project-specific traffic modelling. Therefore, no significant climate effects are anticipated from construction traffic.

For the operational phase, traffic flow information was obtained from NRB Consulting Engineers (2025) for the purposes of this assessment. Two different year scenarios are presented in Table 8-14 of Chapter 8: Air Quality of the EIAR: the 'Do Nothing' and 'Do Something' scenarios for the Opening Year (2028) and Design Year (2043), in line with TII guidance (Opening Year + 15 years). This data, based on project-specific traffic modelling, confirms that none of the impacted road links meet the DMRB thresholds.

As such, a quantitative assessment of traffic emissions on climate has been scoped out, and no significant climate effects are anticipated from either construction or operational traffic.

### 9.15.7 Material Assets-Waste and Utilities (see Chapter 13)

The Proposed Development has been designed in accordance with relevant building design standards, including those related to energy performance and climate resilience. Low-carbon power and heating systems, such as centralised heat pumps and mechanical ventilation with heat recovery, have been incorporated to reduce reliance on imported fossil fuels and minimise GHG emissions. These design choices represent a direct and indirect interaction with climate and are assessed in this chapter.

### 9.15.8 Archaeology and Cultural Heritage (see Chapter 14)

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.

### 9.15.5 Summary

In summary, the Proposed Development's interactions with climate encompass a range of factors including GHG emissions, water resources, biodiversity, soil, human health, air quality, cultural heritage, utilities, and traffic. Effective mitigation strategies and robust monitoring will be essential to address these interactions, minimise adverse effects, and ensure the Proposed Development's resilience to climate change.

## 9.16 Difficulties Encountered When Compiling

There were no difficulties encountered when compiling this assessment.

## 9.17 Conclusion

The assessment of potential adverse effects resulting from the Proposed Development on climate in this chapter has identified the potential sources of GHG emissions and vulnerability of the site to climate change.

It is reasonably considered that following the implementation of 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 will arise from the Proposed Development during the construction or operational phases.

Additionally, the operational and maintenance plan for the Proposed Development and the prescribed energy strategy will provide enhancement to energy efficiency over the long term.

## 9.18 References

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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 Galway Port, along Dock Road and Lough Atalia Road, Galway City. 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 Cousins, Managing Director and Principal Consultant with WDA who has 14 year's industry experience in assessing noise and vibration from road and rail infrastructure on commercial and residential developments. James is an experienced consultant. His qualifications include a BSc (Hons) in Construction Management and Engineering, Pg Cert in Construction Law and Diploma in Acoustics and Noise Control (Institute of Acoustics) and an IOA Competence Cert in Building Acoustic Measurements. James is a member of both Engineers Ireland (MIEI) and the Institute of Acoustics (MIOA) and is the current SITRI Chairman.

## 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 8233:2014 Guidance on sound insulation and noise reduction for buildings;
- 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;
- Galway City Council Noise Action Plan 2024-2028;
- ProPG 2017 Professional Practice Guidance on Planning & Noise;
- AAAC: Licensed Premises Noise Assessment Technical Guideline;
- NRA Traffic Grid Flow Pattern;
- ISO 9613-2: 1996 (Parkplatzlarmstudio 2007);
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- S.I. No. 549/2018 – European Communities (Environmental Noise) Regulations 2018 (hereafter referred to as the Noise Regulations);
- S.I. No. 241/2006 - European Communities Noise Emission by Equipment for Use Outdoors (Amendment) Regulations 2006;
- WHO Environmental Noise Guidelines (2019).
- Galway City Development Plan 2023-2029 (see in particular Policy 9.6).

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 Galway Port along Dock Road and Lough Atalia Road, Galway City. The purpose of the survey was to quantify the existing noise environment to predict its effect on the future occupants of the Proposed Development.

An attended and unattended noise survey was conducted to quantify the existing noise environment. The attended measurement survey also included measurements across the site for calibration of the distance attenuation calculations and noise model. The unattended noise measurements were undertaken on the 5th of February 2025 at 10:15hrs and collected on the 11th of February 2025 at 14:00hrs, attended measurements were taken on the 5th of February 2025 between 04:45hrs and 09:09hrs, to capture the noise climate during both the daytime and nighttime periods under normal operating conditions.

The Proposed Development site is currently used for storage of wind turbine parts and bus parking, with the depot building for the latter use present at the site's northeastern extent. Previously, the Proposed Development site was used as a fuel storage compound with tanks for petrol, diesel and kerosene, although these features have been removed to ground level. Structures currently on-site include a 2-storey office-type building at the site's northern extent (used by a bus company), a single-storey building to the southwest (understood to be a substation) and a single-storey pumphouse to the south (adjacent to the bridge traversing the Lough Atalia outlet).

### 10.3.1 Site Description and Measurement Locations

The Proposed Development site is located on Lough Atalia Road on the Galway Bay docklands, Co. Galway. The Proposed Development site extends to approximately 1.621 Ha. It is irregular in shape but generally bound by the Lough Atalia channel to the northeast and southeast; Dock Road to the south-west; and port lands, Lough Atalia Road and the Texaco filling station to the north-west.

The Galway Bay Complex Special Area of Conservation (SAC) and Inner Galway Bay Special Protection Area (SPA) are adjacent to the Proposed Development site, while Lough Corrib SAC is located downstream of the site, therefore, the requirement for a more detailed assessment has been screened in.




*Figure 10-1Site Location, Measurement Locations A1-A3, Noise Sensitive Locations (NSLs) 1-4 and the SPA and SACs surrounding Galway Bay (NSL's 5-7)*

### 10.3.2 Survey Methodology and Personnel

The attended and unattended surveys were completed by Cathal Reck (Acoustic Consultant) and Sean Rocks (Senior Consultant).

The unattended noise measurements were taken from the 5th of February 2025 at 10:15hrs and collected on the 11th of February 2025 at 14:00hrs.

The attended noise measurements took place on the 5th of February 2025 between 04:45hrs and 09:09hrs, ensuring adequate noise measurements were taken during both night (23:00hrs – 07:00hrs) and day (07:00hrs – 19:00hrs) periods to reflect the prevailing noise climate in the surrounding area.

#### *10.3.2.1 Measurement Locations*

This section outlines the chosen measurement locations and justification for the chosen measurement locations.

**L1:**

Unattended noise measurements were performed at location L1. This site was selected because it offered a secure point to mount the noise logger, mitigating the risk of theft or damage. Additionally, it accurately represents the facade most exposed to noise from the surrounding road traffic.

**A1:**

Attended noise measurements were undertaken at location A1 to establish baseline noise levels. The data was used to determine background noise levels in the vicinity of sensitive receptors NSL3 and NSL4. Furthermore, the noise model was calibrated with these measurements to enhance the accuracy of predicted noise levels from existing road traffic on the proposed development.

**A2:**

Attended measurements were undertaken at location A2 to establish the baseline noise levels. The data was used to determine background noise levels in the vicinity of sensitive receptors NSL1. Furthermore, the noise model was calibrated with these measurements to enhance the accuracy of predicted noise levels from existing road traffic on the proposed development.

**A3:**

Attended measurements were undertaken at location A3 to establish the baseline noise levels. The data was used to determine background noise levels in the vicinity of sensitive receptors NSL2.

#### *10.3.2.2 Unattended Noise Measurements*

An unattended noise logger was deployed in location L1 in general accordance with ISO 1996-1:2016 using ISO Class 1 sound analysers. The monitor was deployed on the 5th of February 2025 at 10:15hrs and collected on the 11th of February 2025 at 14:00hrs. The logger was fixed to the side of an existing wall and extended upwards approximately 4m above the ground as outlined in Figure 10-2. The logger was calibrated before and after the measurements and no significant drift was noted. Measurements were filtered for periods of unsuitable weather conditions (where appropriate).

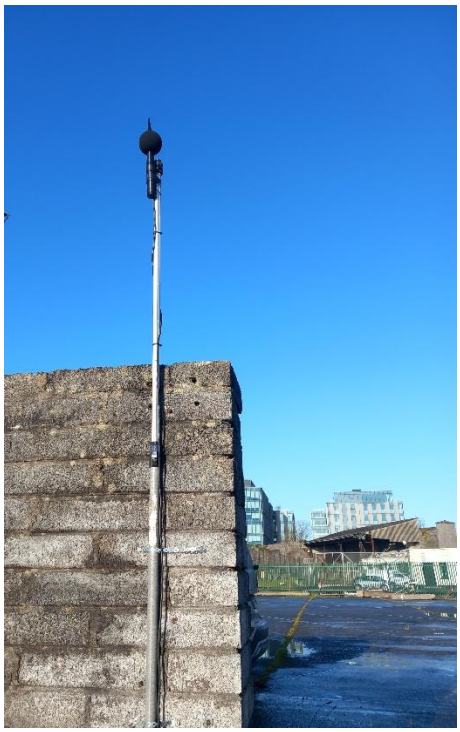


*Figure 10-2 Unattended Noise Measurement Setup*

#### *10.3.2.3 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 a duration of 15-60 minutes in the locations A1-A3 and L1 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 noise measurement setup.



### 10.3.3 Survey Period

The attended noise measurement survey was undertaken from 04:45hrs to 09:09hrs on the 5th of February 2025. The unattended survey took place from 10:15hrs on the 5th of February 2025 to 14:00hrs on the 11th of February 2025.

### 10.3.4 Subjective Noise Environment

During the attended survey the following noise sources were noted:

- Passing traffic including Heavy Goods Vehicles (HGVs) and cars from the port;
- Plant noise from the docks and surrounding commercial buildings; and
- Operational noise from the docks including loading boats.

### 10.3.5 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 Asset Number | Model | Serial No. | Calibration Certificate No. | Calibration Due Date |
|---|---|---|---|---|---|
| **Sound Level Meter** | SLM4 | Nti XL2-TA | A2A-23316-E1 | UK-23-100 | 01/09/2025 |
| **Calibrator** | CAL1 | Nor 1251 | 31056 | AC240268 | 09/10/2025 |

### 10.3.6 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.

#### *10.3.6.1 Attended Measurement Results*

Table 10-2 illustrates the results of the attended noise measurement survey conducted on the 5th of February 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** |
| A2 | 05/02/2025 | 04:45 | 0:15:00 | 59 | 78 | 40 |
| A1 | 05/02/2025 | 05:04 | 0:15:00 | 61 | 77 | 47 |
| A3 | 05/02/2025 | 05:26 | 0:15:00 | 48 | 67 | 43 |
| A1 | 05/02/2025 | 05:49 | 0:15:00 | 63 | 81 | 50 |
| A2 | 05/02/2025 | 06:10 | 0:15:00 | 66 | 83 | 53 |
| A3 | 05/02/2025 | 06:29 | 0:15:00 | 49 | 63 | 44 |
| A3 | 05/02/2025 | 07:15 | 1:00:00 | 54 | 75 | 48 |

| Measurement | | | | Measurement Noise Levels | | |
|---|---|---|---|---|---|---|
| Location | Date | Time (hrs) | Duration (mins) | $L_{Aeq}$ dB | $L_{AFmax}$ dB | $L_{A90}$ dB |
| A1 | 05/02/2025 | 08:27 | 0:15:00 | 68 | 90 | 59 |
| A2 | 05/02/2025 | 08:48 | 0:15:00 | 69 | 79 | 65 |
| A1 | 05/02/2025 | 09:09 | 0:15:00 | 68 | 80 | 59 |

### *10.3.6.2 Unattended Noise Measurement Results*

Table 10-3 outlines the results of noise measurements at the unattended monitoring location L1. A full breakdown of all of the unattended measurement results are provided in Volume III, Appendix 10-1.

*Table 10-3 Unattended Measurement Results*

| Start Date | $L_{Aeq,16hour}$ (07:00 – 23:00) dB | $L_{night}$ ($L_{Aeq,8hour}$ 23:00 – 07:00)(1) dB | $L_{den}$ (00:00 – 00:00) dB | 10th highest night-time $L_{AFmax}$ dB | $L_{A90}$ (23:00 – 07:00)(2) dB |
|---|---|---|---|---|---|
| 05/02/2025 | 57(1) | 51 | 59(1) | 64 | 42 |
| 06/02/2025 | 57 | 52 | 59 | 66 | 43 |
| 07/02/2025 | 57 | 51 | 60 | 64 | 43 |
| 08/02/2025 | 56 | 51 | 59 | 64 | 44 |
| 09/02/2025 | 56 | 51 | 59 | 66 | 42 |
| 10/02/2025 | 58 | 52 | 60 | 65 | 44 |
| 11/02/2025 | 58(1) | N/A | N/A | N/A | N/A |

1) Shortened measurement duration i.e the unattended measurements were started at 10:15hrs and not 07:00hrs, resulting in a full period (day/night) not being recorded.
2) Where night-time period is referred to, the date is the date the measurement commenced on at 23:00hrs and finished at 07:00hrs on the following calendar day.

### *10.3.6.3 Discussion of Measurement Results*

The unattended noise measurements were taken over weekend and weekday periods to establish the existing noise conditions within the boundary of the Proposed Development site

at different periods. The attended measurements were taken in the surrounding area to establish the surrounding noise climate. The ambient noise consisted of traffic noise from the docks and local roads in the surrounding area as well as operational and plant noise from the docks and surrounding commercial premises.

### 10.3.7 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. Weather conditions during the unattended noise survey were taken from Met Eireann historic weather data archives, the historic weather data during the unattended noise survey were observed to be of calm wind conditions less than 5 m/s and little to no rainfall for the duration of the survey period.

## 10.4 Characteristics of the Proposed Development

The Land Development Agency (LDA) intends to apply to Galway City Council for permission for a 'Large-Scale Residential Development' (LRD) at a site of 1.621 Ha in Galway Port at Dock Road and Lough Atalia Road, Galway City, and extending to include parts of both roads for road infrastructure works and water services infrastructure works.

A comprehensive description of the Proposed Development is presented in Chapter 2 (Description of the Proposed Development) of this EIAR.

## 10.5 Potential Effect of the Proposed Development

The Proposed Development will be executed in three distinct phases to facilitate a staged occupation. The proposed sequence of demolition and construction outlined in this section is subject to confirmation once the building contract has been awarded and on completion of the detailed Construction and Environmental Management Plan (CEMP) for agreement with Galway City Council (GCC). The overall duration of the construction phase is anticipated to span approximately 30 months, starting with the demolition then the construction of Blocks A and B, followed by Blocks C and D.

The sequencing of the demolition and construction phases of the Proposed Development is intended to proceed as follows:

The Proposed Development will be executed in three distinct phases to facilitate a staged completion and occupation. The proposed sequence of construction outlined below is subject to confirmation once the building contract has been awarded and on completion of the Detailed Construction Management Plan for agreement with GCC. The duration of the demolition phase is anticipated to span approximately 3 months, and the overall construction phase is anticipated to span approximately 27 months, starting with Blocks A and B, followed by Blocks C and D.

**Demolition Phase (Approximately 3 months):**

- Demolition of the existing office / bus depot building (370.2 sq m) and ancillary building (26.0 sq m);
- Partial demolition of the existing ESB sub-station and ancillary building (67.4 sq m); and

- Demolition of existing boundary walls at the south-west and north-west of the site.

**Construction Phase 1 (Approximately 15 months):**

- Construction of Blocks A and B (186 no. units);
- Road works along Dock Road;
- New internal street and parking court;
- Upgrade of road adjacent to petrol filling station;
- Installation of toucan crossing and associated footpath; and
- Landscaping around public square, courtyard and Lough Atalia Walk.

**Construction Phase 2 (Approximately 12 months):**

- Construction of Blocks C and D (170 no. residential units); and
- Completion of landscaping, including the remainder of Lough Atalia Walk.

### 10.5.1 Description of Likely Significant Effects

The construction of the proposed development will be a multi-phase process with the potential to generate noise and vibration that could affect nearby receptors. The construction timeline is broken down into three main phases: Demolition, Construction Phase 1, and Construction Phase 2. The likely significant effects will arise from the use of heavy machinery and construction activities during these periods.

**Demolition Phase:**
The Demolition Phase is expected to last for approximately 3 months. During this period, the primary noise and vibration sources will be the demolition of existing structures and boundary walls on the site. Key activities include the demolition of a 370.2 sq m office/bus depot building, a 26.0 sq m ancillary building, and a 67.4 sq m section of an ESB substation. Additionally, boundary walls at the south-west and north-west of the site will be removed. The plant and equipment used during this phase, such as excavators, concrete breakers, and pulverisers, are known to be significant sources of noise and vibration.

**Construction Phase 1:**
Following demolition, Construction Phase 1 will last for approximately 15 months. This phase will focus on the construction of Blocks A and B, which comprise 186 residential units. Other significant works during this time include road works along Dock Road, the creation of a new internal street and parking court, and the upgrade of the road adjacent to the petrol station. A new toucan crossing and associated footpath will also be installed, along with landscaping around the public square, courtyard, and a section of Lough Atalia Walk. The noise and vibration profile during this phase will be dominated by equipment such as excavators, cement mixers, auger piling rigs, and various saws, all of which have the potential to cause elevated noise levels.

**Construction Phase 2:**
The final construction phase is projected to take 12 months. This period will see the construction of Blocks C and D, consisting of 170 residential units. The completion of landscaping, including the remainder of Lough Atalia Walk, will also take place. While this phase may involve less heavy-duty equipment than the earlier phases, the use of drills, power tools, and hand tools will still contribute to the overall noise and vibration emissions from the site. A

summary of the significance of the noise and vibration effects during the construction phase pre-mitigation is outlined in Table 10-4.

*Table 10-4 Summary of Construction Phase Effects Pre Mitigation*

| Quality | Significance | Duration | Type |
|---|---|---|---|
| Neutral | Significant | Temporary | Noise |
| Neutral | Slight | Temporary | Vibration |

### 10.5.2 Construction Phase

#### *10.5.2.1 Construction Phase Noise*

GCC have not outlined specific construction noise limits within the Galway City 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 10-5:

*Table 10-5 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<br><br>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".*

##### *10.5.2.1.1 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 10-5 and the background noise in the area. The construction noise criteria are outlined in Table 10-6, 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.

Construction of the Proposed Development will proceed in phases to facilitate staged occupation, beginning with the construction and release of Blocks A and B to tenants.

*Table 10-6 Construction Noise Limits*

| Noise Sensitive Location | Distance to the Centre of the Site (m) [2] | Ambient Noise dB(A) $L_{eq}$ | Noise Limit dB(A) $L_{eq}$ [1] |
|---|---|---|---|
| NSL1 – Hotel | 125 | 69 | 65 |
| NSL2 – Residential | 360 | 54 | 65 |
| NSL3 – Residential | 380 | 68 | 65 |
| NSL4 – Residential | 250 | 68 | 65 |
| NSL5 – Inner Galway Bay SPA | 50 | 58 | 65 |
| NSL6 – Galway Bay Complex SAC | 365 | 58 | 65 |
| NSL7 – Lough Corrib SAC | 270 | 58 | 65 |
| NSL8 (Block A) [3] | 40 | 58 | 65 |
| NSL9 (Block B) [3] | 28 | 58 | 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.
3) Blocks A and B assessed as NSL's for construction phase 2.

For the relevant 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.

#### *10.5.2.1.2 Noise Predictions*

Construction noise for the site has been predicted based on the information provided. A summary of the expected equipment, noise levels and operating times are provided in Table 10-7.

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. As previously outlined, the construction of the Proposed Development will proceed in three phases (including demolition) to facilitate staged occupation, beginning with Blocks A and B as phased occupation.

All demolition activities, including site clearance, are scheduled to be finalised before the commencement of construction on Blocks A and B. The Environmental Impact Assessment Report (EIAR) will fully assess the impacts of the demolition phase, but it will not consider them concurrently with the construction or future occupation of Blocks A and B, as these activities will not occur simultaneously. This methodology prevents any ambiguity and provides a clear and separate evaluation of the impacts associated with each stage of the development.

The closest noise sensitive receptor is The Harbour Hotel to the west with a line of sight to the Proposed Development, NSL1 and the remaining sensitive receptors are outlined in Figure 10-1.

*Table 10-7 Proposed Demolition and 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 | Digger | 77 | 6 Hours |
| | Carpentry tools | 78 | 5 Hours |
| | Skill saw | 84 | 3 Hours |
| Demolition | Excavator | 77 | 4 Hours |
| | Concrete breaker | 92 | 2 Hours |
| | Pulveriser mounted on excavator | 80 | 2 Hours |
| | Hand held pneumatic breaker | 83 | 2 Hours |
| | Drills (into concrete) | 89 | 2 Hours |
| | Dumper | 81 | 5 Hours |
| | Telescopic handler | 71 | 5 Hours |
| Substructure | Excavators | 77 | 5 Hours |
| | Con Saws | 84 | 4 Hours |
| | Rail Saw | 85 | 4 Hours |
| | Drills (Into Concrete) | 89 | 3 Hours |
| | Dumper | 81 | 5 Hours |
| | Cement Mixer (Discharging) | 75 | 4 Hours |
| | Lorry Idling | 80 | 2 Hours |
| | Telescopic Handler | 71 | 6 Hours |
| | Cement Pump | 78 | 4 Hours |
| | Auger Piling | 82 | 6 Hours |
| Superstructure | Drills (Into Concrete) | 89 | 6 Hours |
| | Power Tools | 70 | 5 Hours |

| 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 |
|---|---|---|---|
| | Impact Steel | 69 | 2 Hours |
| | Hammer | 69 | 3 Hour |
| | Dumper | 81 | 3 Hours |
| | Cement Mixer (Discharging) | 75 | 4 Hours |
| | Lorry Idling | 80 | 2 Hours |
| | Telescopic Handler | 71 | 6 Hours |
| External Finishes | Hand Tools | 70 | 6 Hours |
| | Power Tools | 70 | 5 Hours |
| Internal Finishes | N/A | N/A | N/A |

Table 10-8 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 outlined in BS 5228-1:2009+A1 during all construction stages of the Proposed Development.

*Table 10-8 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 | Demolition | Substructure | Superstructure | External Finishes |
| NSL1 | 65 | 69 | 69 | 73 | 73 | 72 |
| NSL2 | 65 | 56 | 58 | 60 | 60 | 57 |
| NSL3 | 65 | 68 | 71 | 71 | 71 | 71 |
| NSL4 | 65 | 68 | 71 | 71 | 71 | 71 |
| NSL5 | 65 | 68 | 68 | 75 | 74 | 62 |
| NSL6 | 65 | 59 | 61 | 63 | 62 | 61 |
| NSL7 | 65 | 59 | 62 | 64 | 63 | 61 |
| NSL8 (Block A) | 65 | 70 | -- | 77 | 76 | 63 |
| NSL9 (Block B) | 65 | 73 | -- | 80 | 79 | 64 |

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 10.6.1.1 shall be implemented to control construction noise levels at the NSLs.

#### *10.5.2.1.3 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 NRB Consulting Engineers Ltd, and outlined in Chapter 12: Material Assets: Traffic, there will be a maximum of 50 vehicles arriving and departing the site per 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 10-9 outlines the magnitude of effects associated with changes in traffic noise levels.

*Table 10-9 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 |

#### *10.5.2.1.4 Conclusion of Unmitigated Noise Effects -Construction Phase*

Based on the construction noise assessment, the Proposed Developments construction phase is expected to have a significant and temporary effect from on-site noise, as noise levels will exceed project criteria without mitigation. This conclusion is based on a binary judgment of significance, acknowledging that while the effect is temporary, its magnitude requires a clear and definitive classification. It is important to note that the demolition phase, which also has the potential for significant noise impacts, was fully completed before the commencement of construction of Blocks A and B, thereby preventing any overlap of these effects. Regarding construction traffic, the projected increase in vehicle usage is considered minimal and is not expected to cause a perceptible or significant increase in noise levels on the surrounding road network. To address the significant on-site noise and vibration impacts, mitigation measures developed and outlined in Section 10.6.1 will be incorporated into the Construction Environmental Management Plan (CEMP), detailing the necessary mitigation measures to ensure that the overall effects of construction are properly managed and reduced to acceptable levels. Table 10-10 outlines the summary of unmitigated construction phase noise effects.

*Table 10-10 Summary of Construction Phase Effects Pre Mitigation*

| Quality | Significance | Duration | Type |
|---|---|---|---|
| Neutral | Significant | Temporary | Noise |

#### *10.5.2.2 Construction Phase – Vibration*

The GCC 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 10-11:

*Table 10-11 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 |

##### *10.5.2.2.1 Construction Vibration Predictions*

Vibration effect is not anticipated for most of the construction stage, however some vibration is expected to be generated during the demolition and substructure stage where activities such as demolition works, piling, and earthworks are likely to occur. 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 10-12.

*Table 10-12 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 |

##### *10.5.2.2.2 Conclusion of Unmitigated Vibration Effects – Construction Phase*

Based on the environmental assessment, the Proposed Developments construction phase is expected to have a temporary effect from on-site vibration. While the potential for vibration exists, the magnitude of these effects is not anticipated to reach a level that would be considered significant without mitigation. This conclusion is based on a binary judgment of significance, an effect is either significant, or it is not, and indicates that vibration is not a major concern for the Proposed Development. It is important to note that the demolition and substructure phase, which have the highest potential for significant vibration impacts, were fully completed before the construction of Blocks A and B began, thereby preventing any

overlap of these effects with the main construction activities. To address any potential nuisance from vibration, a Construction Environmental Management Plan (CEMP) will be implemented, detailing the necessary management measures to ensure that the overall effects of construction are properly managed and minimized. Table 10-13 outlines the summary of unmitigated construction phase vibration effects.

*Table 10-13 Summary of Construction Phase Effects Pre Mitigation*

| Quality | Significance | Duration | Type |
|---|---|---|---|
| Neutral | Slight | Temporary | Vibration |

### 10.5.3 Assessment of Construction Noise and Vibration Effects on SPA/SAC Wildlife

The potential effects from noise and vibration generated by construction activities have been assessed in relation to the nearest SPA and SACs to the Proposed Development site: the Galway Bay Inner SPA, The Galway Bay Complex SAC and the Lough Corrib SAC. These areas are home to a variety of protected species, and due to their conservation status, detailed assessments of potential effects from noise and vibration are required at planning stage.

Based on discussions with the Ecologist preparing the Biodiversity Chapter, reference has been drawn from two key references:

- Goodship, N.M & Furness, R.W (2022) *Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species*; and
- Ruddock, M. & Whitfield, D.P (2007) *A Review of Disturbance Distances in Selected Bird Species*.

These references are widely used in Irish and UK EIARs to inform mitigation measures for construction projects near sensitive bird habitats.

There is no single noise level threshold that guarantees no disturbance to all bird species during construction. However, general guidance suggests:

- Noise levels below 55 dB(A) Leq are typically acceptable for non-breeding birds in open habitats;
- Levels below 45 dB(A) Leq are recommended near breeding sites or for sensitive species such as divers, terns, and curlew; and
- Levels of 65 dB(A) Leq and above are likely to cause disturbance, particularly during nesting, feeding, or roosting periods.

While construction works have the potential to significantly affect nearby SPA and SAC areas, a range of mitigation measures to reduce the significance of these effects have been included to reduce the significance of these effects. These are detailed in Section 10.6 of this chapter.

Table 10-14, provided by the Ecologist – DNV, outlines the specific species that inhabit the SPA/SAC areas proximate to the Proposed Development site, along with recommended maximum noise levels. Some species like the Black-throated Diver, Curlew and Common Tern are more sensitive to noise. Others, like Gulls or Lapwing, may tolerate slightly higher noise levels but still require caution.

*Table 10-14 Recommended Maximum Noise Levels per Species*

| Species Name | Scientific Name | Recommended Max Noise Level (dB(A)) |
|---|---|---|
| Black-throated Diver | *Gavia arctica* | 45 dB(A) |
| Great Northern Diver | *Gavia immer* | 45 dB(A) |
| Cormorant | *Phalacrocorax carbo* | 55 dB(A) |
| Grey Heron | *Ardea cinerea* | 55 dB(A) |
| Light-bellied Brent Goose | *Branta bernicla hrota* | 50 dB(A) |
| Teal | *Anas crecca* | 55 dB(A) |
| Red-breasted Merganser | *Mergus serrator* | 50 dB(A) |
| Ringed Plover | *Charadrius hiaticula* | 50 dB(A) |
| Golden Plover | *Pluvialis apricaria* | 50 dB(A) |
| Lapwing | *Vanellus vanellus* | 55 dB(A) |
| Dunlin | *Calidris alpina* | 50 dB(A) |
| Bar-tailed Godwit | *Limosa lapponica* | 50 dB(A) |
| Curlew | *Numenius arquata* | 45 dB(A) |
| Redshank | *Tringa totanus* | 50 dB(A) |
| Turnstone | *Arenaria interpres* | 55 dB(A) |
| Black-headed Gull | *Chroicocephalus ridibundus* | 55 dB(A) |
| Common Gull | *Larus canus* | 55 dB(A) |
| Common Tern | *Sterna hirundo* | 45 dB(A) |
| Wigeon | *Mareca penelope* | 50 dB(A) |
| Sandwich Tern | *Thalasseus sandvicensis* | 45 dB(A) |

In addition to the various bird species that inhabit the local SPA and SCA areas , otters and seals are also present in Galway Bay and require due consideration in terms of noise and vibration effects. There have been no observations made of otters actively using the site lands or the presence of holts on the site lands, however consideration to the surrounding SPA and SCA has still been given in terms of noise and vibration effects.

Otters are highly sensitive to both visual and acoustic disturbance, especially in areas used for foraging, resting, or breeding. Construction noise, particularly from coastal engineering works, can lead to avoidance of key habitats such as riverbanks, estuaries, and coastal zones. While specific noise level thresholds are not universally defined, noise levels above 50-60 dB(A) near holts or resting sites are generally considered potentially disruptive.

Mitigation measures to minimise these effects are outlined in Section 10.6.

Kruuk (2006) documented otters continuing to use habitats near roads, railways, and urban areas with ambient noise levels of 50-65dB, suggesting a degree of tolerance to intermittent or consistent background noise.

While specific noise threshold data for otters is limited, studies on other semi-aquatic mammals indicate that behavioural impacts become more pronounced at continuous noise levels above 65-70dB. Although otters are recognised as sensitive to persistent or impulsive noise under certain conditions, evidence from both literature and site-specific analysis strongly indicates that:

- The predicted airborne noise levels, even at the worst-case NSL (NSL5) will not exceed thresholds known to cause disturbance, provided that mitigation measures outlined in Section 10.6 are implemented in full; and
- Otters in the area are likely habituated to a baseline level of urban noise.

Seals are sensitive to both airborne and underwater noise, particularly during pupping and haul-out periods. Activities such as piling, dredging, and vessel traffic can cause temporary displacement, stress, or even hearing damage if not properly mitigated. Underwater noise levels above 160 dB re 1 µPa (peak) can cause behavioural disturbance, while airborne noise levels of above 70 dB(A) near haul-out sites may cause flushing or abandonment. The use of soft-start procedures, seasonal restrictions and acoustic barriers will help reduce potential noise and vibration effects on the habitats during the construction phase.

Based on the predicted construction noise levels and the implementation of the mitigation outlined in Section 10.6, the potential for noise and vibration effects on seals is considered minimal.

In conclusion, while seals and otters can be sensitive to human-induced noise under certain conditions, the predicted noise levels associated with the construction phase of the Proposed Development are below the thresholds known to provoke behavioural disturbance as outlined in Table 10-8. Birds are more sensitive to noise disturbance; however, the mitigation outlined in Section 10.6 and additional noise and vibration monitoring near the SPA and SAC areas will support the effective control of noise and vibration emissions during the temporary construction phase. Therefore, based on current best available scientific evidence and ecological assessment, noise effects on otters, seals, and birds during the construction phase are considered minor, temporary and adequately addressed by the mitigation measures proposed in Section 10.6.

### 10.5.4 Operational Phase

#### *10.5.4.1 Operational Phase Noise Limits*

The main potential source of operational noise from the Proposed Development is plant and equipment, traffic movements, car parking, crèche play area and external/public amenity spaces.

The GCC 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 10-15 offers guidance as to the likely effect associated with any particular change in traffic noise level (Source: DMRB, 2011)

*Table 10-15 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 |

#### 10.5.4.1.1 BS 4142: Methods for Rating and Assessing Industrial and Commercial Sound.

BS 4142 states that and exceedance of the noise source of the background noise by:

- +10 dB or more indicates that complaints are likely;
- + 5 dB is of marginal significance; and
- The rating level is more than 10 dB below the measured background noise level, then this is a positive indication that complaints are unlikely.

BS4142 outlines guidance for penalty corrections to be applied to the noise sources in question should the noise source have one of the following characteristics:

- The noise contains a distinguishable, discreet, continuous tone (whine, or hum);
- The noise contains distinct impulses (i.e. bangs);
- The noise is intermittent; or
- The noise is irregular.

#### 10.5.4.1.2 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 elements is to be applied to the daytime and evening measured $L_{Aeq,T}$ values to determine the appropriate rating level ($L_{Ar,T}$). In all cases, an assessment by a competent person will be required.*

*During the night-time period no tonal or impulsive noise from the facility should be clearly audible or measurable at any NSL."*

### *10.5.4.2 Operational Noise - Predictions*

This section outlines the predicted noise effect of the operational phase of the Proposed Development on the surrounding sensitive locations.

#### *10.5.4.2.1 Plant Noise*

The operational external plant and equipment, located on the roof of Block C, is integral to the Proposed Development's infrastructure. This extensive rooftop installation includes the proposed Aermec PRM0504XH°AV°°P1 air source heat pumps, a unit designed to provide comprehensive climate control for the entire development.

The detailed layout of this rooftop plant is presented in Figure 10-4, while its sound power level is documented in Table 10-16. The rooftop plant will be enclosed within a louvered screen to manage potential noise effects on surrounding sensitive receptors and the Proposed Development's residential blocks. The design specifications for this enclosure are detailed in the drawings provided by ALTU Architects. The acoustic performance of this louvre will be sufficient to ensure that noise breakout from the rooftop plant remains within acceptable limits and prevents any adverse noise disturbances. Further details on the required performance and specifications of this louvre are provided in Section 10.6 of this chapter. Architectural drawings provided by ALTU Architects for use in the assessment, referenced in this chapter, are as follows:

- P104.2 Block C - Plans 2 of 2
- P104.3 Block C - Elevations Sections

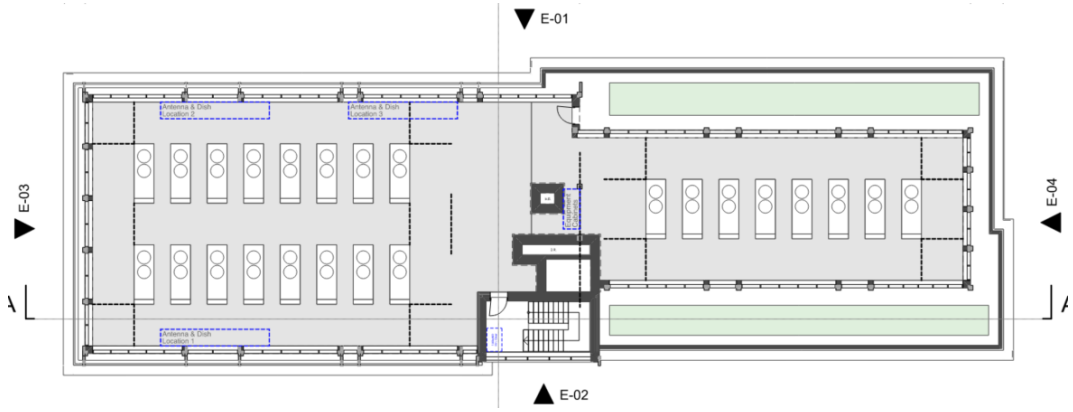



*Figure 10-4 Block C Roof Plant Location (Ref: P104.2 Block C - Plans 2 of 2)*

*Table 10-16 Aermec ASHP Sound Power Levels*

| Description | 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 | |
| PRM0504XH°AV°°P1 | 90(1) | 93 | 84 | 82 | 86 | 77 | 69 | 61 | 88 |

1) No values given for 63 Hz in documentation, values assumed based on adjacent bands.

#### *10.5.4.2.2 Ground Floor Energy Centre Plant Room*

There are plant rooms located at the ground floor of each apartment block, which will contain essential mechanical, electrical, and plumbing (MEP) equipment, including various pumps and tanks. While the specific plant and equipment have not yet been specified, it is imperative that a detailed acoustic review is undertaken at the detail design stage. This review must ensure that all proposed equipment complies with relevant acoustic criteria, thereby guaranteeing an appropriate internal and external noise environment for future residents.

#### *10.5.4.2.3 Plant Noise - Unmitigated Noise Effects*

The operation of the external plant, including the Aermec air source heat pumps located on the roof of Block C, is expected to have a neutral quality of effect on the surrounding environment. While the plant is an integral and permanent part of the Proposed Development, its noise output will be controlled by a louvered acoustic screen. The design of this screen ensures that noise breakout will be contained within acceptable limits, preventing any adverse disturbances to nearby sensitive receptors.

However, without specific mitigation, the noise from the plant is expected to have a significant adverse effect on the residential units within the development itself, particularly those on and above the 7th floor of Blocks A, B and D. Due to their proximity and elevation relative to the energy centre at roof level of Block C, these floors are highly susceptible to noise exposure. The effect on these facades will be permanent and continuous, and the probability of a significant noise effect is likely. Therefore, specific mitigation measures will be required to manage the noise exposure at these facades to ensure internal noise levels comply with relevant standards.

#### *10.5.4.2.4 Crèche Play Area*

The Block B mixed-use block features a crèche and associated play area to the north of the Proposed Development. Noise levels from the crèche play area during operation have been assessed based on measured noise levels from similar play areas and incorporated into the noise model. By leveraging data from a comparable environment, the assessment benefits from established baseline measurements which provide insight into typical acoustics properties of outdoor play areas.

In addition to the measured noise data, the crèche play area has been assigned an on-time in the model which assumes 3 hours of daily outdoor play for the crèche. Table 10-17 outlines the sound power spectrum used in the assessment.

*Table 10-17 Play Area Sound Power Levels*

| Description | 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 | |
| Measured play area noise levels | 80 | 77 | 75 | 76 | 75 | 71 | 65 | 55 | 79 |

#### *10.5.4.2.5 Crèche Play-Area – Unmitigated Noise Effect*

The operational noise from the crèche play area in the Block B mixed-use block has been assessed using measured data from a similar environment. The noise model, which assumes three hours of daily outdoor play, indicates that the effects of the crèche will be neutral in quality and imperceptible in significance. This is because the noise generated is comparable to typical background sounds and does not cause a noticeable change in the acoustic environment. The effect is likely to occur and will be permanent throughout the crèche's operational life. However, based on the assessment, the overall effect is concluded to be not significant.

#### *10.5.4.2.6 External Amenity Space*

This section outlines the external amenity noise levels used for the assessment. Guidance has been sought from Association of Australasian Acoustical Consultants (AAAC): Licensed Premises Noise Assessment Technical Guideline, V 2.0 for vocal noise spectrums and assessment parameters. The standard offers industry leading guidance on the assessment of groups of persons in various venues and scenarios. Table 10-18 outlines the vocal effort spectra used in the assessment in sound power format with each spectrum accounting for 2 persons speaking in a group of 6, this is in line with the AAAC guideline which assumes 1 in 3 persons speaking simultaneously.

*Table 10-18 Patron Vocal Effort in Sound Power*

| Description | 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 | |
| Normal Vocal Effort (Male) | 56 | 58 | 67 | 69 | 63 | 59 | 55 | 50 | 69 |
| Raised Vocal Effort (Male) | 66 | 67 | 74 | 76 | 73 | 68 | 63 | 57 | 77 |

#### *10.5.4.2.7 External Amenity – Unmitigated Noise Effect*

The assessment of external amenity noise has used established guidelines from the Association of Australasian Acoustical Consultants (AAAC) to model noise from groups of people. This assessment, which assumes a permanent and continuous effect, uses a vocal effort spectrum that accounts for two out of every six people speaking at any given time. While this effect is likely to occur, the quality of the noise is considered neutral and its significance is deemed imperceptible to the surrounding environment. As a result, the noise from the external amenity areas is concluded to be not significant.

#### *10.5.4.2.8 Café/Restaurant*

There are 2 no. proposed café/restaurant spaces located at ground floor level of Block A to the southwest boundary of the site along Dock Road. There is potential for noise breakout from these spaces along with potential for outdoor seating areas to affect the sensitive receptors located nearby. Breakout noise from typical restaurant functions has been assessed through a standard double-glazed window and factored into the noise model with assumed operating hours from 08:00-23:00. Figure 10-5 outlines the proposed restaurant/café spaces

located at ground floor level of Block A. Outdoor seating has been assessed in line with spectra outlined in Table 10-18.

The breakout sound power levels for the café/restaurant have been outlined in Table 10-19, the assessment assumes a sound insulation performance of 56 dB $R_W$ for the wall and standard double glazing for the windows as outlined in Table 10-20. The final performance of the façade will be established at design development stage.

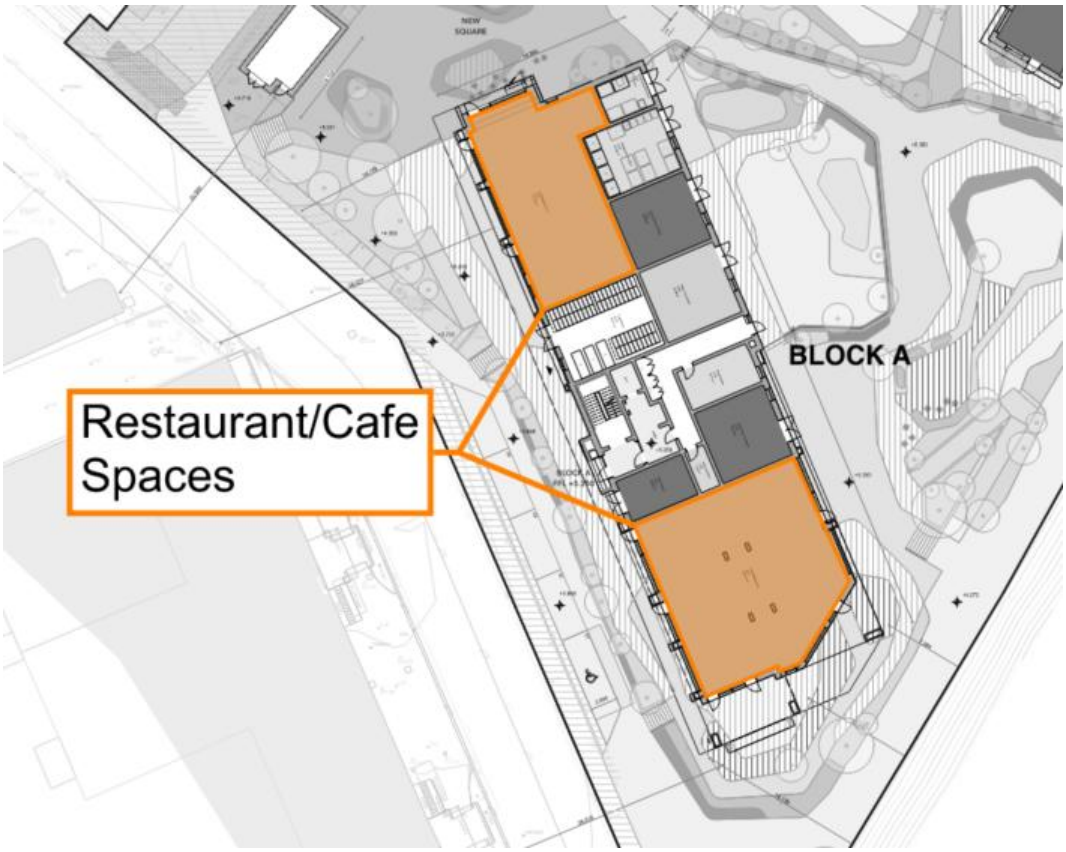



*Figure 10-5 Proposed Café/Restaurant Spaces at Ground Floor Level of Block A (Ref: P101.5 Site Layout Plan - Ground Floor)*

*Table 10-19 Café/Restaurant Breakout Noise in Sound Power Format*

| Description | 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 | |
| Café/Restaurant Breakout Noise | 70 | 65 | 77 | 76 | 72 | 71 | 60 | 78 |

*Table 10-20 Assumed Glazing Performance of Restaurant Windows*

| Description | Glazed Element (Frame & Glazing) Sound Insulation Performance (Assumed) Octave Band Frequency Requirements R dB | | | | | | | Glazing Acoustic Performance dB $R_W$ |
|---|---|---|---|---|---|---|---|---|
| | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | |
| Standard Double Glazing | 16 | 21 | 17 | 25 | 35 | 37 | 31 | 29 |

#### *10.5.4.2.9 Café/Restaurant – Unmitigated Noise Effect*

The two proposed café/restaurant spaces on the ground floor of Block A have been assessed for potential noise breakout and outdoor seating effects on nearby sensitive receptors. The assessment, which assumes operating hours from 08:00-23:00, indicates that the noise generated will be of neutral quality and imperceptible in significance. This is achieved through the assumed sound insulation performance of the walls and windows, which prevents any noticeable noise disturbances. This is a permanent and continuous effect that is likely to occur. However, because the design is intended to contain noise breakout and the outdoor seating has been assessed using an established vocal noise spectrum, the overall effect is concluded to be not significant. The final performance of the façade will be confirmed at the design development stage to ensure compliance.

#### *10.5.4.2.10 Operational Traffic*

Operational phase traffic volumes have been provided by NRB Consulting Engineers Ltd (2025) in Chapter 12: Material Assets: Traffic, which states: *"Subsequently, the TII PE-PAG-02017 Project Appraisal Guidelines for National Roads Unit 5.3 were used to determine future year traffic conditions for the opening year (2028) and design year (2043) on the local road network."*. Table 10-21 outlines the operational traffic volumes for the base year 2024 and the Do-Something years 2028 and 2043.

*Table 10-21 Operational Phase Traffic AADT Figures.*

| Link Number | Road Name | Base Year | Do-Something | |
|---|---|---|---|---|
| | | 2024 AADT | 2028 AADT | 2043 AADT |
| 1 | Site Access | 160 (15% HGV) | 991 (2%HGV) | 1,013 (2% HGV) |
| 2 | Lough Atalia Road (East) | 9,285 (4%HGV) | 10,259 (4%HGV) | 11,528 (4%HGV) |
| 3 | Lough Atalia Road (West) | 9,325 (4%HGV) | 10,461 (4%HGV) | 11,735 (4%HGV)) |
| 4 | Galway Harbour Dock Road 1 | 1,745 (15% HGV) | 1,949 (15% HGV) | 2,188 (15% HGV) |
| 5 | Galway Harbour Dock Road 2 | 1,410 (15% HGV) | 1,591 (15% HGV) | 1,784 (15% HGV) |
| 6 | Galway Harbour Dock Road 3 | 1,380 (15% HGV) | 1,476 (15% HGV) | 1,664 (15% HGV) |
| 7 | Bothar na Long | 8,445 (2%HGV) | 9,603 (2%HGV) | 10,757 (2%HGV) |
| 8 | Dock Road | 8,625 (2%HGV) | 9,493 (2%HGV) | 10,671 (2%HGV) |

#### *10.5.4.2.11 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 10-21Table 10-30, projected traffic flow increases associated with the Proposed Development under the

Do-Nothing scenario are all well below this threshold. Under the Do-Something scenario outlined in Table 10-22, the greatest increase is a 27% rise along Bóthar na Long, representing a worst-case scenario. All other links are subject to lower traffic increases and, consequently,

lower associated noise impacts. Therefore, the predicted change in traffic noise levels across the study area is expected to be no greater than approximately 1 dB(A), which is generally considered barely perceptible and not significant under standard noise impact assessment criteria.

It is generally accepted that it takes an approximate 3dBA increase in noise levels to be perceptible to the average person (Ref: Planning Policy Guidance Note 24 PPG24 - Planning and Noise).

Traffic levels along the site access road are expected to increase substantially, as the baseline traffic levels recorded during the base year survey were very low. However, when compared to the traffic volumes on the surrounding road network, the increase from base year to the design year is expected to have a minimal effect on the overall noise levels in the surrounding area.

The entrance road to the Proposed Development will experience a substantial increase in traffic due to the construction and operation of the Proposed Development. This increase has been incorporated into the noise model. Despite the rise in traffic volumes, no significant increase in noise levels at NSLs is predicted, as the noise emissions from the entrance road is considerably less than those from the surrounding existing road network. The percentage increase of traffic flows from base year 2024 in Table 10-21 is outlined in Table 10-22.

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 10-22.

*Table 10-22 Combined Increase in Operational Traffic for the Base Year and Do-Something Scenarios*

| Link Number | Road Name | Base Year | Do-Something | |
|---|---|---|---|---|
| | | 2024 | 2028 | 2043 |
| 1 | Site Access | -- | 519% | 533% |
| 2 | Lough Atalia Road (East) | -- | 10% | 24% |
| 3 | Lough Atalia Road (West) | -- | 12% | 26% |
| 4 | Galway Harbour<br>Dock Road 1 | -- | 12% | 25% |
| 5 | Galway Harbour<br>Dock Road 2 | -- | 13% | 27% |
| 6 | Galway Harbour<br>Dock Road 3 | -- | 7% | 21% |
| 7 | Bothar na Long | -- | 14% | 27% |

| Link Number | Road Name | Base Year | Do-Something | |
|---|---|---|---|---|
| | | 2024 | 2028 | 2043 |
| 8 | Dock Road | -- | 10% | 24% |

*Table 10-23 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 |

#### *10.5.4.2.12 Operational Phase Traffic – Unmitigated Noise Effect*

Based on the noise assessment, the predicted changes in operational traffic noise levels associated with the Proposed Development are concluded to be not significant. This determination is based on a number of factors. While traffic on the immediate site access road will increase substantially due to its low baseline, this increase will have a minimal effect on the overall noise levels of the wider road network. The noise model, which incorporates this increase, predicts no significant rise in noise at Noise Sensitive Locations (NSLs), as the emissions from the new entrance road are considerably less than those from the surrounding, pre-existing road network. The worst-case scenario, a 27% increase in traffic along Bóthar na Long, is expected to cause a change of no more than 1 dB(A). This change is considered imperceptible to the average person, as it falls well below the 3 dB(A) increase typically required for human perception. Therefore, the effects are assessed as neutral in quality and imperceptible in significance. While these changes are likely to occur and will be permanent, their lack of a discernible impact means the overall conclusion is one of no significant effect.

#### *10.5.4.2.13 Car Parking*

The Proposed Development includes 37 car parking spaces. These spaces are primarily located along the new entrance road and between Blocks B and D, with a small number of additional spaces near Block A along Dock Road. Based on the provided site layout drawings, operational noise from the surface-level car parking will be limited to this central area.

Noise events from car parking will be isolated and of short duration, characterized by vehicle movements like engine start-ups and closures. Considering the nature and location of these activities, the noise effects are determined to be neutral in quality and imperceptible in significance. While these events are likely to occur, their impact on the surrounding acoustic environment is concluded to be not significant at any of the nearby Noise Sensitive Locations (NSLs).

#### *10.5.4.3 Daytime Noise Effect*

As the Proposed Development has the potential to generate noise with different characteristics for both the daytime and night-time periods, a model has been undertaken for both the day and night-time operational situations of the Proposed Development. The operational noise assessment takes into consideration the specific sources operating on the development such as the plant and equipment located on the roof of Block C, external amenity spaces, crèche play area and breakout noise from the 2 no. café/restaurants located in Block A as indicated in Figure 10-6. 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 10.5.4.2.11.4.7 and 10.5.2.4.8.



*Figure 10-6 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:

- 36 no. persons occupying the amenity spaces between Blocks B and C, speaking with normal vocal effort as per Table 10-18, between the hours of 07:00-23:00;
- 18 no. persons occupying the amenity spaces between Blocks B and C, speaking with normal vocal effort as per Table 10-18, between the hours of 07:00-23:00;
- Breakout noise from café/restaurant spaces glazed element as per Table 10-19, between the hours of 08:00-23:00;
- 18 persons occupying outdoor seating areas along proposed café/restaurant units, speaking with normal vocal effort as per Table 10-18, between the hours of 08:00-23:00.
- Crèche outdoor play area operational for 3 hours per day during the hours of 08:00-18:00; and
- Energy centre plant on Block C roof operating 100% of the time.

#### *10.5.4.3.1 BS 4142 Noise Effect Assessment (Daytime 07:00 – 23:00)*

The noise effects at the nearest Noise Sensitive Locations (NSL1–NSL7) 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 10-24 outlines the assessment at the closest NSL (NSL5), 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 NSL5.

The residual and background noise levels were taken from the unattended logger positions and averaged across the entire measurement period; this is indicative of all typical noise climates in the surrounding area. In BS 4142, residual sound is defined as the ambient sound that remains when the specific sound under assessment is suppressed or removed.

*Table 10-24 Noise Effect During Daytime Hours*

| Results | | Relevant BS 4142 Clause | Commentary |
|---|---|---|---|
| Predicted specific sound level (daytime) | $L_{Aeq(60min)}$ = 44dB | 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 NSL5. |
| Residual sound level (daytime) | $L_{Aeq(16,hour)}$ = 57dB | 7.3.2 | The residual sound level was dominated by road traffic noise on surrounding roads. Background noise from measurement location L1 was assessed as this is representative for worst case receptor NSL5. |
| Background sound level (daytime) | $L_{A90(16,hour)}$ = 52dB | 8.1.2<br>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 | $L_{Aeq(60min)}$ = 44dB | 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. |
| Acoustic feature correction | +0dB | 9.2<br>9.3.2 | It is not anticipated that the specific sound will have any impulsive, tonal or intermittent characteristics. |
| Rating level | (44 + 0) dB = 44dB | 9.2 | |
| Background sound level | $L_{A90(16,hour)}$ = 52dB | 8 | |
| Excess of rating over background sound level | (44 - 52) dB = -8dB | 11 | Assessment indicates that no adverse effect is likely on the noise sensitive locations as the specific sound is 8dB |

| Results | | Relevant BS 4142 Clause | Commentary |
|---|---|---|---|
| | | | below the background levels and is lower than the residual sound. Context has also been considered. |
| 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 NSL5. |

#### *10.5.4.3.2 Consideration of Tonality and Impulsivity*

The assessment for tonality and impulsivity has determined that the noise emissions from the Proposed Development are lower than the existing background and residual noise levels. As a result, the emissions are unlikely to have an effect at the Noise Sensitive Locations (NSLs) or produce any tonal or impulsive characteristics. The quality of the effect is considered neutral, with a significance that is imperceptible. This is a permanent and continuous effect, but because it will not cause any noticeable change in the acoustic environment, the overall conclusion is not significant.

#### *10.5.4.3.3 EPA NG4*

NG4 recommends a daytime noise criterion of 55 dB $L_{Ar,T}$ (07:00–19:00 hrs) for assessing industrial and commercial noise in areas of low background sound levels. At NSL5, the predicted noise emissions from the Proposed Development during daytime hours are 44 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 NSL5 are expected to remain well below the NG4 criterion, and compliance with the guidance is anticipated. Table 10-25 outlines the predicted noise effect at each noise sensitive location, the project criteria and compliance with the project criteria.

*Table 10-25 Operational Noise Levels at Each Sensitive Receptor*

| Noise Sensitive Location | Distance to the Centre of the Site (m) | EPA NG4 Daytime Criteria $L_{Ar,T}$ dBA | Predicted Noise Level from the Proposed Development $L_{eq,T}$ dBA |
|---|---|---|---|
| NSL1 – Hotel | 125 | 55 | 37 |
| NSL2 – Residential | 360 | 55 | 30 |
| NSL3 – Residential | 380 | 55 | 29 |
| NSL4 – Residential | 250 | 55 | 29 |
| NSL5 – Inner Galway Bay SPA | 50 | 55 | 44 |
| NSL6 – Galway Bay Complex SAC | 365 | 55 | 36 |
| NSL7 – Lough Corrib SAC | 270 | 55 | 26 |

#### *10.5.4.3.4 Overall Day-time Noise Effect*

Based on the operational noise assessment, the Proposed Development's effects are considered not significant across all assessed sources, with the exception of the rooftop plant on Block C, which poses a potential internal noise issue for the Proposed Development itself.

The noise from the crèche play area, external amenity spaces, and café/restaurant is assessed as having a neutral quality and an imperceptible significance at nearby sensitive locations. These are permanent and continuous effects that are likely to occur, but the modelling, which incorporates operational hours and a vocal effort spectrum, demonstrates that the resulting noise levels will not cause a noticeable change in the acoustic environment.

Regarding operational traffic noise, the overall effect is concluded to be not significant. While traffic on the new access road will increase substantially, its impact is minimal when compared to the existing wider road network. The worst-case scenario, a 27% increase in traffic on Bóthar na Long, is predicted to cause a permanent change of only about 1 dB(A), which is considered imperceptible to the average person. Therefore, the effect is neutral and not significant. Similarly, noise from car parking is considered not significant due to its short duration, isolated nature, and imperceptible effect on NSLs.

The external plant on the roof of Block C, while an integral part of the development, has been assessed with its louvered acoustic screen in place. With this design measure, the noise from the plant is determined to have a neutral quality and an imperceptible significance on the surrounding sensitive receptors. This is a permanent and continuous effect that is likely to occur. As the effect is imperceptible, it is concluded to be not significant at these external locations. However, the noise from the plant is still likely to have an adverse effect on the residential units within the development itself, particularly those on and above the 7th floor, due to their proximity and elevation. This is a permanent and continuous effect that must be addressed at the detailed design stage to ensure internal noise levels comply with all relevant standards.

### *10.5.4.4 Night-time Noise Effect*

At night-time, the Proposed Development may generate noise with different characteristics compared to daytime operations. The noise model for the night-time scenario focuses on sources expected to operate during this period, including rooftop plant and equipment on Block C and potential breakout noise from the cafés/restaurants in Block A. Traffic and car parking has been assessed separately and found not have any significant effect on the surrounding sensitive receptors as outlined in Section 10.5.2.4.8 and 10.5.2.4.8.

The nighttime (23:00 – 07:00) situation assumes the following noise sources:

- 36 no. persons occupying the amenity spaces between Blocks B and C, speaking with normal vocal effort as per Table 10-18, between the hours of 23:00-01:00;
- 18 no. persons occupying the amenity spaces between Blocks B and C, speaking with normal vocal effort as per Table 10-18, between the hours of 23:00-01:00;
- Restaurant assumed to close at 23:00;
- Crèche assumed to not operate during the nighttime period; and
- Energy centre plant on Block C roof operating 100% of the time.

#### *10.5.4.4.1 BS 4142 Noise Effect Assessment (Night-time 23:00 – 07:00)*

The noise effect at the nearest NSLs (NSL1-NSL7) has been assessed in accordance with BS4142. Table 10-26 outlines the assessment at the closest NSL (NSL5), which is the worst-case receptor due to its proximity to the Proposed Development. All other NSLs have been assessed and are predicted to have lower onset noise levels than NSL5. The residual and background noise levels were taken from the unattended logger positions and averaged across the entire measurement period; this is indicative of all typical noise climates in the surrounding area.

*Table 10-26 Noise Effect During Nighttime Hours*

| Results | | Relevant BS 4142 Clause | Commentary |
|---|---|---|---|
| Predicted specific sound level (nighttime) | $L_{Aeq(15min)}$ = 44dB | 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 NSL5. |
| Residual sound level (nighttime) | $L_{Aeq(8,hour)}$ = 51dB | 7.3.2 | The residual sound level was dominated by road traffic noise on surrounding roads. Background noise from measurement location L1 was assessed as this is representative for worst case receptor NSL5. |
| Background sound level (nighttime) | $L_{A90(8,hour)}$ = 43dB | 8.1.2<br>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 | $L_{Aeq(15min)}$ = 44dB | 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. |
| Acoustic feature correction | +0dB | 9.2<br>9.3.2 | It is not anticipated that the specific sound will have any impulsive, tonal or intermittent characteristics. |
| Rating level | (44 + 0) dB = 44dB | 9.2 | |
| Background sound level | $L_{A90(8,hour)}$ = 43dB | 8 | |
| Excess of rating over background sound level | (44 - 43) dB = 1dB | 11 | Assessment indicates that no adverse effect is likely on the noise sensitive locations as the specific sound is 1dB above the background levels and is lower than the residual sound. Context has also been considered. |
| Uncertainty of the assessment | Not significant | 10 | The specific sound is a worst-case prediction as the assessment assumes a worst-case operational |

| Results | | Relevant BS 4142 Clause | Commentary |
|---|---|---|---|
| | | | scenario. The assessed specific sound is the worst-case prediction to NSL2. |

#### *10.5.4.4.2 Consideration of Tonality and Impulsivity*

The assessment for tonality and impulsivity has determined that the noise emissions from the Proposed Development are lower than the existing background and residual noise levels. As a result, the emissions are unlikely to have an effect at the Noise Sensitive Locations (NSLs) or produce any tonal or impulsive characteristics. The quality of the effect is considered neutral, with a significance that is imperceptible. This is a permanent and continuous effect, but because it will not cause any noticeable change in the acoustic environment, the overall conclusion is not significant.

#### *10.5.4.4.3 EPA NG4*

NG4 recommends a nighttime criterion of (23:00hrs – 07:00hrs) 45dB $L_{Aeq,T}$, in areas of low background noise, the predicted noise emissions from the development are 44 dBA at NSL5, with no tonality or impulsivity, therefore the NG4 criteria is expected to be achieved. Table 10-27 outlines the predicted noise effect at each noise sensitive location, the project criteria and compliance with the project criteria.

*Table 10-27 Operational Noise Levels at Each Sensitive Receptor*

| Noise Sensitive Location | Distance to the Centre of the Site (m) | EPA NG4 Nighttime Criteria $L_{Aeq,T}$ dBA | Predicted Noise Level from the Proposed Development $L_{eq,T}$ dBA |
|---|---|---|---|
| NSL1 – Hotel | 125 | 45 | 37 |
| NSL2 – Residential | 360 | 45 | 29 |
| NSL3 – Residential | 380 | 45 | 29 |
| NSL4 – Residential | 250 | 45 | 29 |
| NSL5 – Inner Galway Bay SPA | 50 | 45 | 44 |
| NSL6 – Galway Bay Complex SAC | 365 | 45 | 36 |
| NSL7 – Lough Corrib SAC | 270 | 45 | 26 |

#### *10.5.4.4.4 Overall Night-time Noise Effect*

Based on the operational noise assessment, the Proposed Development's effects are considered not significant across all assessed sources, with the exception of the rooftop plant on Block C, which poses a potential internal noise issue for the Proposed Development itself.

The noise from the crèche play area, external amenity spaces, and café/restaurant is assessed as having a neutral quality and an imperceptible significance at nearby sensitive locations. These are permanent and continuous effects that are likely to occur, but the modelling, which incorporates operational hours and a vocal effort spectrum, demonstrates that the resulting noise levels will not cause a noticeable change in the acoustic environment.

Regarding operational traffic noise, the overall effect is concluded to be not significant. While traffic on the new access road will increase substantially, its impact is minimal when compared to the existing wider road network. The worst-case scenario, a 27% increase in traffic along Bóthar na Long, is predicted to cause a permanent change of only about 1 dB(A), which is considered imperceptible to the average person. Therefore, the effects are assessed as neutral in quality and imperceptible in significance. Similarly, noise from car parking is considered not significant due to its short duration, isolated nature, and imperceptible effect on NSLs.

The external plant on the roof of Block C, while an integral part of the development, is assessed as having a neutral quality of effect on the surrounding sensitive receptors. The plant's noise will be managed by a louvered acoustic screen, making its external effect imperceptible and not significant. However, without further specific mitigation, the noise from the plant is likely to have an adverse effect on the residential units within the development itself, particularly those on and above the 7th floor, due to their proximity. This is a permanent and continuous effect that will need to be addressed at the detailed design stage to ensure compliance with relevant internal noise standards.

#### *10.5.4.5 Assessment of Openable Windows*

Based on the assessment of the roof level energy centre on Block C conducted in Section 10.5.4.2, the façade noise levels of the floors above the energy centre of the surrounding apartment blocks are above the recommended threshold for internal noise levels with openable windows. Generally, 15 dB of attenuation is achieved by a tilted or half open window based on guidance from BS 8233. Façades above the energy centre failing to meet internal noise level criteria with windows in the tilted or half open position during both the daytime and nighttime scenarios due to the noise from the plant and equipment located in the energy centre. Table 10-28 outlines the most exposed façades to the plant and equipment noise from the energy centre and the internal noise levels through a tilted or half open window without mitigation.

*Table 10-28 Façade and Internal Noise Levels of Floors Above Energy Centre*

| Block | Façade Noise Level $L_{Aeq}$ dB | Internal Noise Level Criteria (Worst-Case) Nighttime $L_{Aeq}$ dB | Internal Noise Levels Through Partially Open Window $L_{Aeq}$ dB |
|---|---|---|---|
| Block B – 9th Floor | 62 | 30 (Sleeping) | 47 |
| Block D 10th Floor | 60 | 30 (Sleeping) | 45 |
| Block A 8th Floor | 60 | 30 (Sleeping) | 45 |

Figure 10-7 displays a façade noise map or a grid noise map from 8th floor up as these are the most exposed façades to the energy centre noise emissions. The assessment does not include the louvre as mitigation.

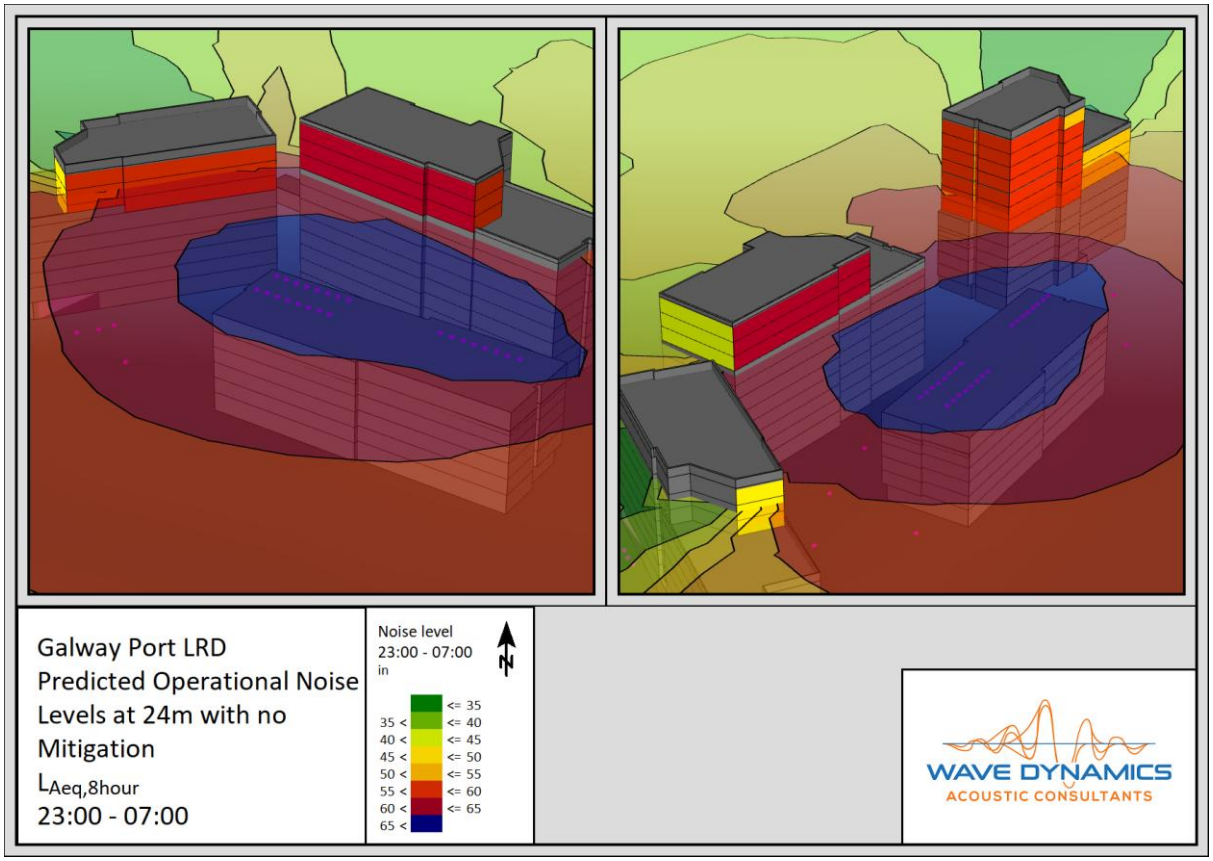



*Figure 10-7 Façade Noise Map of Energy Centre Effect on Surrounding Façades Without Mitigation*

The results of the internal noise assessment through openable windows indicate that the unit load conditions and corresponding sound power levels should be reviewed during the detailed design stage. This review is critical since the current model assumes a 100% load operating 100% of the time. The assessment has determined that an enhanced glazing specification will be required for the upper floors of the surrounding apartment blocks to achieve acceptable internal noise levels. Additionally, a mechanical ventilation strategy will be necessary to allow future residents to maintain a suitable internal environment without needing to open windows. The standalone Acoustic Design Statement (WDA240937RP_A_01-Acoustic Design Statement) in Volume III Appendix 10-2 reflects this design approach.

#### *10.5.4.5.1 Assessment of Openable Windows [CONCLUSION].*

The unmitigated noise emissions from the roof level energy centre on Block C are expected to have a negative quality of effect on the facades of Blocks A, B, and D, particularly on the upper floors (8th floor and above). The effect on these floors is concluded to be significant, as the predicted internal noise levels (e.g., 47 dB $L_{Aeq}$ in Block B on the 9th floor) substantially exceed the worst-case nighttime criterion of 30 dB $L_{Aeq}$. This effect is permanent and continuous throughout the operational life of the plant and is likely to occur. This assessment highlights that without a comprehensive mitigation strategy, the noise from the energy centre will lead to an unacceptable living environment for residents on the affected floors.

#### *10.5.4.6 Assessment of Operational Noise and Vibration Effects on SPA/SAC Wildlife*

During the operational phase of the Proposed Development, potential effects from noise and vibration on nearby designated ecological sites (the Galway Bay Inner SPA, the Galway Bay Complex SAC, and the Lough Corrib SAC) have been considered. These areas support a range of sensitive bird species, as well as otters and seals.

The operational phase assessment draws on the same ecological guidance as that for the construction phase assessment (See Section 10.5.2.2.2), including:

- Goodship, N.M & Furness, R.W (2022) *Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species*; and
- Ruddock, M. & Whitfield, D.P (2007) *A Review of Disturbance Distances in Selected Bird Species*.

Table 10-12 outlines recommended maximum noise levels for key species present in the SPA/SAC areas. Species such as the Black-throated Diver, Curlew, and Common Tern are particularly sensitive to noise, with thresholds as low as 45 dB(A).

However, based on the worst-case predicted operational noise levels (see Table 10-27) and the existing ambient noise climate in the surrounding area (see Table 10-2 and Table 10-3), it is unlikely that operational noise or vibration will result in significant disturbance or habitat abandonment for species occupying the SPA and SAC habitats in Galway Bay and Lough Atalia.

#### *10.5.4.7 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 10-29 outlines the range of vibration values and the associated potential effects on humans.

*Table 10-29 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.

The Proposed Development is a mixed-use development offering residential, crèche and commercial spaces, there are no predicted sources of vibration that will cause significant adverse effect on the surrounding NSLs.

While no specific Irish vibration criteria exist for buildings, the vibration assessment is based on the accepted guidance from BS 5228-2:2009+A1:2014. The standard assesses human response to vibration in terms of Peak Particle Velocity (PPV). This guidance indicates that vibration may become perceptible in residential environments at levels of approximately 0.3 mm/s and could lead to complaints at higher magnitudes, such as 1 mm/s.

The operational phase of the Proposed Development is not predicted to generate any sources of vibration. The effect is concluded to be neutral in quality and imperceptible in significance. This is a permanent effect, yet its probability of occurrence is unlikely. Therefore, the overall conclusion is that the operational vibration effect on the surrounding Noise Sensitive Locations (NSLs) will be not significant.

### 10.5.5 Potential Cumulative Effects

A review of other off-site developments was completed as part of this assessment. Chapter 2 (Description of the Proposed Development) 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.

The following planning applications have been reviewed as part of this assessment:

**GCC Reg. Ref. 2460108 (ABP/ACP Ref. 320100):**

The proposed 15 storey hotel at the corner of Lough Atalia Road and Bóthar na Long, Galway is located approximately 60-70 meters from the boundary of the Proposed Development assessed in this EIAR Chapter. The Planning Authority has taken a decision to refuse permission of application Reg. Ref. 2460108, however, the decision is currently under appeal at the time of writing.

**Construction Phase:**

The proposed hotel at the corner of Lough Atalia Road and Bóthar na Long is located approximately 60-70 meters from the boundary of the development in this EIAR Chapter. If construction periods for both projects were to run simultaneously, there is a likelihood of combined noise and vibration effects on the surrounding area. However, given the current planning status of the hotel application (refused permission, now under appeal) and the staggered construction phases of the Proposed Development, it is anticipated that any cumulative impacts will be minimized. This will be ensured by the full implementation of the mitigation measures outlined in this chapter.

**Operational Phase:**

The cumulative effect of both the Proposed Development and the hotel will not cause adverse noise or vibration conditions on the surrounding area during the long-term operational phase. This is based on the assumption that both developments will adhere to all relevant noise criteria and that the operational noise and vibration from each will be appropriately managed and controlled. Therefore, the combined effect of both developments is considered to be not significant once they are operational.

**GCC Reg. Ref. 20/47 (ABP/ACP Ref. 310568-21)**

The proposed large-scale, mixed-use development on lands to the rear of Ceannt Train Station, Station Road, Galway City, consisting of 376 no. apartments, retail units,

café/restaurant/bar units, hotel, office use, childcare facility, car parking and other services is located approximately 270 meters from the boundary of the Proposed Development assessed in this EIAR Chapter. Based on the attenuation of sound over distance and the high density of screening from existing buildings and infrastructure in the area between these two developments, there will likely be no cumulative noise and vibration effects during the short-term construction phase and the long-term operational phase of both developments. This is assuming construction periods line up and run simultaneously.

**Construction Phase:**

Given the considerable distance of approximately 270 meters between the two developments, combined with the significant sound attenuation provided by existing buildings and infrastructure, it is unlikely that any cumulative noise and vibration effects will be experienced during the short-term construction phase. This assessment holds true even if both projects' construction periods run simultaneously.

**Operational Phase:**

During the long-term operational phase, the distance and screening between the two developments will continue to provide effective attenuation. Consequently, there will be no cumulative noise and vibration effects on the surrounding area. The quality of this effect is neutral, its significance is imperceptible, and it is considered to be not significant.

**ABP/ACP Ref. PA0033**

The Galway Harbour extension project is currently awaiting final decision in An Coimisiún Pleanála (formerly An Bord Pleanála). Based on the EIAR and EIAR Non-Technical Summary (NTS) submissions, Chapter 10 developed by Biospheric Engineering Ltd, concludes that noise levels in the existing Docks area due to shipping will reduce. Additionally, there will be no significant environmental effects due to airborne noise as a result of the proposed Harbour extension.

**Construction Phase:**

The Galway Harbour extension project is currently awaiting a final decision from An Coimisiún Pleanála (formerly An Bord Pleanála). Its EIAR concludes that there will be short-term, minor noise effects during its construction, particularly from activities like blasting and dredging. If both developments are constructed simultaneously, there is a likelihood of an adverse cumulative noise effect on the Special Protection Areas in Galway Bay. To minimize this impact, the Harbour EIAR recommends that activities generating high underwater noise are avoided during the fish migration period (April to July).

**Operational Phase:**

Based on the Harbour's EIAR, the operational phase of the Galway Harbour extension project will not result in any significant environmental effects due to airborne noise. It is also concluded that noise levels from shipping in the existing Docks area will be reduced. Therefore, the long-term cumulative noise effects between the two developments are expected to be not significant.

**ABP- 314597-22**

The application for the BusConnects Galway Cross-City Link will ensure public transport services can access key areas such as the retail and recreational centre of the city; public transport hubs at the rail and bus station; City and County Halls; along with the city centre hotels and Bed & Breakfasts on College Road to the east of the city centre and key areas such as University Hospital Galway, NUI Galway, the Sportsground and Galway Cathedral.

**Construction Phase:**

The BusConnects Galway Cross-City Link has been approved, with construction works expected to be of short duration. Its EIAR, prepared by Arup, concludes that most construction activities will have a negative, not significant to slight, and temporary effect. However, general road works, urban landscaping, and utility diversion works are predicted to have a negative, moderate to significant, and temporary effect on receptors within 10 meters. Given the approval in 2024 and the short-term nature of its construction, it is unlikely that the two projects' construction periods will overlap, thereby avoiding a cumulative noise and vibration effect.

**Operational Phase:**

Chapter 9 of the BusConnects EIAR concludes that the operational phase will not cause a negative noise effect on the surrounding area during the 2028 design year. This is due to traffic redistribution. As a result, the long-term cumulative noise effect from both developments in operation is also predicted to be not significant on surrounding sensitive receptors.

Figure 10-8 displays the cumulative developments in the surrounding area in an aerial view.

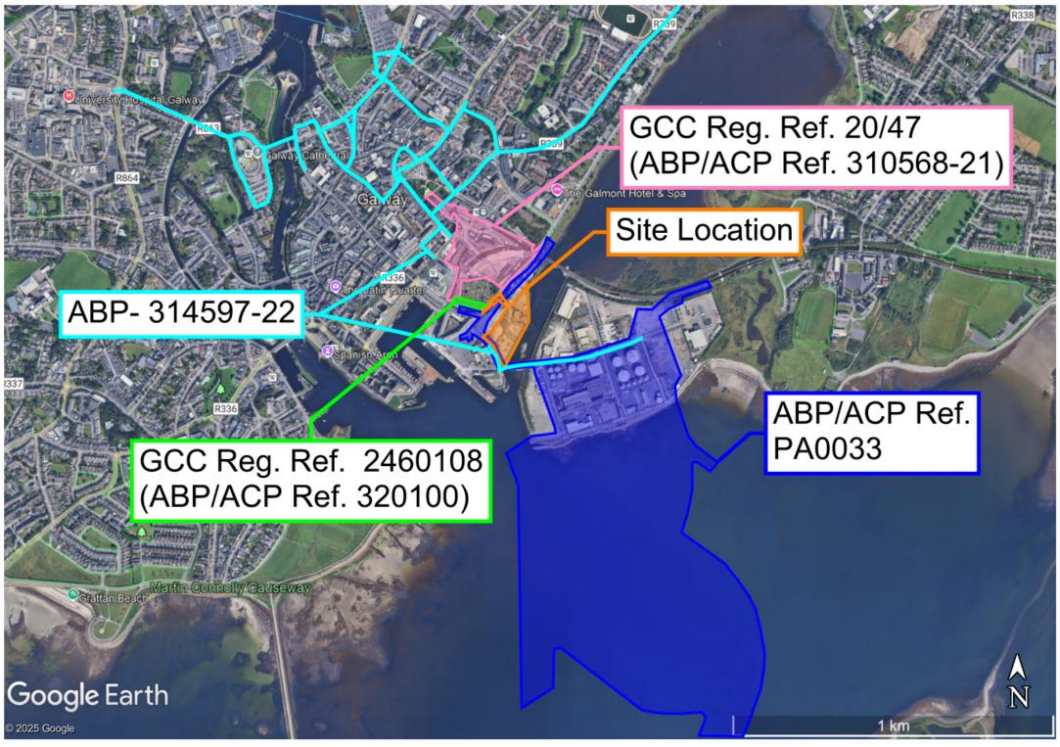



*Figure 10-8 List of Cumulative Schemes in the Surrounding Area*

### 10.5.6 "Do Nothing" Effect

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 Table 10-30 aided by Chapter 12: Material Assets: Traffic, lend to the prevailing noise and vibration environment remaining the same as measured during the baseline survey period. Table 10-31 outlines the percentage increase of traffic figures from the Base Year 2024 to the Do-Nothing years 2028 and 2043.

However, the demand for housing and associated infrastructure generated by the existing and projected population would persist. In the absence of development at this centrally located, serviced, and zoned site, this demand may be displaced to less sustainable, peripheral, or unserviced locations. This could result in greater environmental impacts due to increased land take, car dependency, and pressure on less serviced or less accessible infrastructure.

As the site is zoned for development, in the absence of the Proposed Development, it is likely that a development of a similar nature is likely to be constructed in the future in line with national policy and the development plan objectives. Therefore, the construction and operational phase effects outlined in this assessment are likely to occur in the future, even in the absence of the Proposed Development.

*Table 10-30 Operational Phase Traffic Flows – Base Year and Do-Nothing Years*

| Link Number | Road Name | Base Year | Do-Nothing | |
|---|---|---|---|---|
| | | 2024 AADT | 2028 AADT | 2043 AADT |
| 1 | Site Access | 160 (15% HGV) | 171 (15% HGV) | 193 (15% HGV) |
| 2 | Lough Atalia Road (East) | 9,285 (4%HGV) | 9,929 (4%HGV) | 11,197 (4%HGV) |
| 3 | Lough Atalia Road (West) | 9,325 (4%HGV) | 9,972 (4%HGV) | 11,246 (4%HGV) |
| 4 | Galway Harbour Dock Road 1 | 1,745 (15% HGV) | 1,866 (15% HGV) | 2,104 (15% HGV) |
| 5 | Galway Harbour Dock Road 2 | 1,410 (15% HGV) | 1,508 (15% HGV) | 1,700 (15% HGV) |
| 6 | Galway Harbour Dock Road 3 | 1,380 (15% HGV) | 1,476 (15% HGV) | 1,664 (15% HGV) |
| 7 | Bothar na Long | 8,445 (2%HGV) | 9,031 (2%HGV) | 10,184 (2%HGV) |
| 8 | Dock Road | 8,625 (2%HGV) | 9,223 (2%HGV) | 10,401 (2%HGV) |

*Table 10-31 Combined Increase in Operational Traffic for the Base Year and Do-Nothing Scenarios*

| Link Number | Road Name | Base Year | Do-Nothing | |
|---|---|---|---|---|
| | | 2024 | 2028 | 2043 |
| 1 | Site Access | -- | 7% | 21% |
| 2 | Lough Atalia Road (East) | -- | 7% | 21% |

| Link Number | Road Name | Base Year | Do-Nothing | |
|---|---|---|---|---|
| | | 2024 | 2028 | 2043 |
| 3 | Lough Atalia Road (West) | -- | 7% | 21% |
| 4 | Galway Harbour Dock Road 1 | -- | 7% | 21% |
| 5 | Galway Harbour Dock Road 2 | -- | 7% | 21% |
| 6 | Galway Harbour Dock Road 3 | -- | 7% | 21% |
| 7 | Bothar na Long | -- | 7% | 21% |
| 8 | Dock Road | -- | 7% | 21% |

Table 10-32 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 in the range of 1dB(A).

*Table 10-32 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 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.

### 10.6.1 Construction Phase

#### 10.6.1.1 Noise and Vibration Mitigation Measures

Best practice measures for noise and vibration from construction sites are found within BS 5228 (2009+A1:2014) part 1 and part 2. 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 mitigation measures outlined in this chapter will be incorporated into the CEMP.

The best practice measures set out in BS 5228 (2009) Part 1 and 2 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.

##### *10.6.1.1.1 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. All plant used onsite will comply with S.I. No. 632/2001 - European Communities (Noise Emission by Equipment For Use Outdoors) Regulations, 2001.

##### *10.6.1.1.2 Noise Control at Source*

Where replacing a noisy item of plant is not viable or practical, noise shall be controlled 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 used 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;
- The use of local screening for noisy activities or works with hand tools;
- 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.

##### *10.6.1.1.3 Vibration Control*

Vibration monitoring will be implemented during the demolition and substructure stages of the construction phase to ensure vibration effects are monitored and controlled adequately as to not cause significant effects at the surrounding sensitive receptors. Suitable locations for vibration monitoring are at NSL1 and the Wildlife SPA/SAC boundary with the Proposed Development lands.

#### *10.6.1.1.4 Screening*

Screening will be used to reduce the construction noise effect on the NSLs. The use of site hoarding and careful selection of areas for noisy works, using buildings on the site, site offices and the building being constructed to screen noise from the works.

Local screening of noisy works with the use of temporary acoustic barriers, examples are as follows:




*Figure 10-9 Temporary Construction Noise Barrier © Ventac*

#### *10.6.1.1.5 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.

This is crucial as the construction of the Proposed Development is proposed to be a phase construction and occupancy approach with the construction of Blocks A and B being constructed and occupied during phase 1, with phase 2 beginning shortly after occupancy of phase 1. A public liaison officer shall be appointed by the contractor to liaise with the occupants of phase 1 regarding matters of noise and vibration disturbance.

#### *10.6.1.1.6 Site Specific Recommendations*

The calculations set out in Table 10-8 of Section 10.5.2.1 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 10-33 outlines the required attenuation for each construction stage.

*Table 10-33 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 | Demolition | Substructure | Superstructure | External Finishes |
| NSL1 | 65 | 4 | 6 | 6 | 6 | 4 |
| NSL2 | 65 | 0 | 0 | 0 | 0 | 0 |
| NSL3 | 65 | 3 | 3 | 3 | 3 | 3 |
| NSL4 | 65 | 3 | 4 | 4 | 4 | 3 |
| NSL5 | 65 | 3 | 9 | 10 | 9 | 0 |
| NSL6 | 65 | 0 | 0 | 0 | 0 | 0 |
| NSL7 | 65 | 0 | 0 | 0 | 0 | 0 |
| NSL8 (Block A) | 65 | 5 | -- | 12 | 11 | 0 |
| NSL9 (Block B) | 65 | 8 | -- | 15 | 14 | 0 |

Table 10-34 outlines the recommended site-specific noise mitigation measures.

*Table 10-34 Mitigation Measures Required During Construction Phase*

| Construction Stage | Recommended Noise Mitigation Measures |
|---|---|
| Site Setup | Erect a minimum 2.4m high site hoarding that blocks the line of sight between noise source and receiver.<br><br>Example construction for the site hording would be as follows:<br>A 2.4m high and 9mm plywood (4.5 kg/m2). Barrier must be solid and not contain gaps at the bottom or between adjacent panels<br><br>Local screening are required around hand tools in addition to hoarding. |
| | An absorptive lining shall be considered for screening around hand tools will need to have an absorptive lining to avoid reflections increasing noise at other receivers.<br><br>On this project 8 NSL's have been identified, It is recommended that a noise monitor shall be placed on the boundary of the nearest noise sensitive locations closest to the works i.e. NSL1 and NSL8/NSL9 during phase 2 in this case. |
| Demolition | Site hoarding to block line of sight. Local screening around noisy plant and equipment.<br><br>Noise and vibration monitoring. |
| Substructure | Site hoarding to block line of sight. Local screening around noisy plant and equipment.<br><br>Noise and vibration monitoring as above |

| Construction Stage | Recommended Noise Mitigation Measures |
|---|---|
| Superstructure | Local screening around saws/hammers where possible. Use external new building to screen noise from works where possible.<br><br>Noise and vibration monitoring as above |
| External finishes | Local screening around hand tools.<br><br>Noise and vibration monitoring as above |

#### *10.6.1.2 Ecological Mitigation Measures*

To minimise the potential adverse effects of construction-related noise and vibration on nearby the nearby SPA and SACs, the following mitigation measures will be implemented:

- Exercise additional caution during construction works in the nesting season (March 1st to August 31st);
- Implement a key-turn policy to ensure machinery is not left idling when not in use;
- Use low-noise equipment wherever possible;
- Schedule works outside of dawn and dusk, which are peak activity times for birds;
- Appoint an Ecological Clerk of Works to monitor and advise on ornithological sensitivities;
- Install noise and vibration monitoring equipment along the SPA/SAC boundaries to track construction impacts in real time. Monitoring systems shall include hard thresholds and alert mechanisms to pause work if exceedances occur until a solution is identified;
- Use acoustic barriers along the works boundary to screen construction noise as effectively as possible; and
- Avoid construction works near known otter holts during the breeding season (typically May to August) and implement buffer zones of at least 150 metres from active holts to minimise disturbance.

### 10.6.2 Operational Phase

#### *10.6.2.1 Noise Mitigation Measures*

The assessment conducted on the operational phase of the Proposed Development takes into account the operation of the external amenity spaces, car parking, plant and equipment, crèche play area and café/restaurant breakout noise. The predicted results of the operational noise assessment predict that there will be no significant noise effect on the surrounding sensitive receptors, therefore no mitigation measures are required to control operational noise levels.

At design development stage, and the final plant and equipment schedule developed, noise levels for each piece of equipment shall be reviewed by an Acoustic Consultant to ensure compliance with the limits set in this chapter and to protect the amenity of the future residents of the Proposed Development.

Based on the assessment carried out for ventilation through openable windows on the floors of the surrounding apartment blocks that are above the energy centre, the predicted internal noise levels are in exceedance of project criteria based on an assessment of plant noise breakout through acoustic louvres and the uncovered roof of the energy centre. Mitigation has

been developed and recommended in the form of enhanced glazing performance to the façades facing the energy centre.

To mitigate potential noise effects on surrounding sensitive receptors and the Proposed Development's residential blocks, a louvered acoustic enclosure will surround the units. WDA has provided specific design specifications for this enclosure, which is detailed on the drawings provided by ALTU Architects, ensuring that noise breakout from the rooftop plant remains within acceptable limits and prevents any adverse noise disturbances.

#### *10.6.2.1.1.1 Louvre Performance*

An acoustic louvre is proposed to surround the energy centre plant to aid in the reduction of noise effects on the floors that are at the same level on the surrounding blocks. The louvred walls will aid in the reduction of noise effects on the floors located along the same level of below the energy centre but will not reduce the noise effect on the floors above the energy centre of the surrounding blocks. Table 10-35 outlines the louvre performance proposed for the louvred walls, Figure 10-10 and Figure 10-11 outline the location of the louvred walls and plant location at roof level.

*Table 10-35 Energy Centre Louvre Performance Requirements*

| Description | Octave Band Transmission Loss (dB) at Octave Band Centre Frequencies, Hz | | | | | | | | Overall Transmission Loss dB |
|---|---|---|---|---|---|---|---|---|---|
| | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | |
| QEF AC300 PF | 10 | 6 | 8 | 11 | 18 | 21 | 19 | 17 | 17 |



*Figure 10-10 Block C Elevation Detailing Louvred Enclosure (Ref: P104.3 Block C - Elevations Sections)*



*Figure 10-11 Block C Elevation Detailing Louvred Enclosure (Ref: P104.3 Block C - Elevations Sections)*

### *10.6.2.2 Assessment of Openable Windows*

Figure 10-12 displays a façade noise map or a grid noise map from the 8th floor up as these are the most exposed façades to the energy centre noise emissions. The assessment includes the louvre performance outlined in Table 10-35.

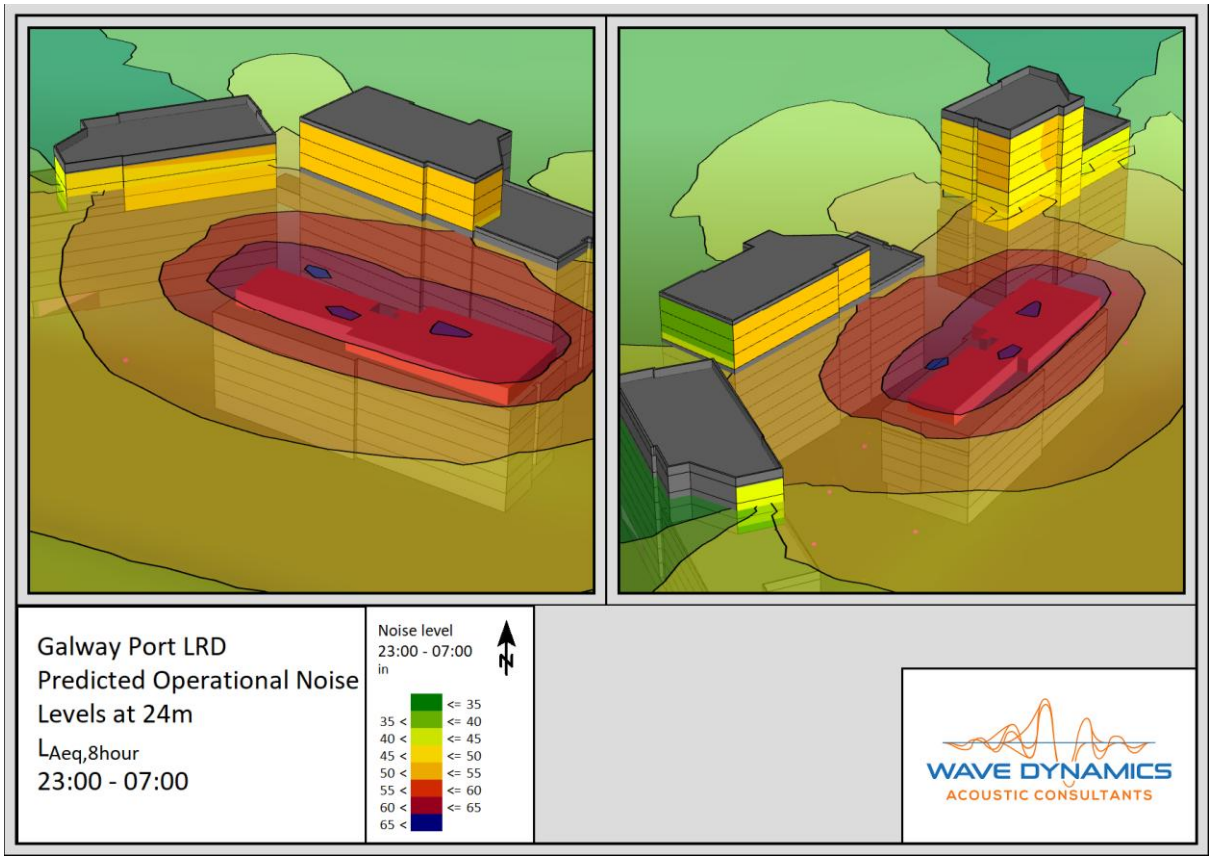



*Figure 10-12 Façade Noise Map of Energy Centre Effect on Surrounding façade*

Based on the results of the internal noise levels through openable windows assessment it is recommended that the unit load conditions and corresponding sound power levels are reviewed at detail design stage (as the model currently accounts for 100% load operating 100% of the time) to ensure that the noise effect on the floors above the energy centre is

minimised as much as practicable. An enhanced glazing specification is recommended for the upper floors on the surrounding apartment blocks to sufficiently reduce the internal noise levels during the daytime and nighttime periods. Mechanical ventilation should be considered at the design development stage when the ventilation strategy is confirmed and further information regarding the mechanical plant specification is readily available. The standalone Acoustic Design Statement (*WDA240937RP_A_01-Acoustic Design Statement*) provided at Volume III Appendix 10-2 reflects this recommendation. The enhanced glazing specification for the floors above the energy centre is outlined in Table 10-36 and Figure 10-13.

*Table 10-36 Sound Insulation Performance for Glazed Elements and Ventilation*

| Façade | Glazed Elements (Frame & Glazing) Sound Insulation Requirements (Indicative requirements equal or approved) | | | | | | | Façade Ventilation Requirement(2) |
|---|---|---|---|---|---|---|---|---|
| | Octave Band Frequency Requirements1 R dB | | | | | | Glazing Acoustic Performance dB RW | |
| | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | | |
| **RED** | 28 | 28 | 29 | 38 | 38 | 34 | 35dB Rw | 38dB Dn,e,w (1)<br>Natural Ventilation or Mechanical Ventilation |

1) Natural ventilation assumed throughout, the performance cited for the ventilator is in the **open position**. Should this change to mechanical ventilation the above specification may be reduced. An acoustic consultant should be engaged to assess the level of reduction appropriate to maintain the internal noise level criteria.

2) The calculation assumes a maximum of 1 ventilation opening per bedroom at the specification outlined in the Acoustic Design Statement.




*Figure 10-13 Façade Specification Markup Detailing Enhanced Glazing Specification to the Upper Floors*

#### *10.6.2.3 Vibration Mitigation Recommendations*

There are no predicted vibration sources during the operational phase, therefore, mitigation measures are not required to control operational phase vibrations. The plant and equipment located at roof level of Block C will be placed on vibration isolation pads to negate any structure-borne noise that may arise from the units in operation, these vibrations will not have an effect on the surrounding sensitive receptors. This shall be reviewed as part of the design review once the final plant and equipment selections are known.

## 10.7 "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 10.5.4.2.10 are not predicted to cause an increase in traffic noise levels at the surrounding sensitive receptors. Additional operational noise sources such as plant and equipment, crèche play area, external amenity spaces, and café/restaurant units all contribute to the operational noise emissions of the Proposed Development, as outlined in Section 10.5.4 the predicted noise emissions of the Proposed Development are within the project criteria.

## 10.8 Residual Effects

This section outlines the potential significant environment effects which remain after mitigation measures are implemented.

### 10.8.1 Construction Phase

#### 10.8.1.1 Noise

As the construction phase is temporary, there will be no long-term/permanent noise effects on the surrounding area from construction noise. Section 10.6 outlines mitigation measures which 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.

#### 10.8.1.2 Vibration

As the construction phase is temporary, there will be no long term/permanent vibration effects on the surrounding area from construction activities. Section 10.6 outlines mitigation measures which 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.

### 10.8.2 Operational Phase

#### 10.8.2.1 Noise

Operational noise sources from the Proposed Development include the roof-level energy centre, crèche play area, external amenity spaces, and on-site traffic from car parking. The energy centre at the roof level of Block C includes a louvered enclosure as a core design feature. While the final plant specifications will be confirmed at the detailed design stage, an acoustic review must be undertaken to ensure the viability of the louvered enclosure. This review will verify that the design effectively controls noise output to meet project criteria.

Based on the operational noise assessment, the predicted noise levels from all sources will not cause adverse noise effects on the surrounding sensitive receptors. These effects are considered to be neutral in quality and slight in significance. They are permanent and continuous, and their occurrence is likely. However, when applying the binary conclusion framework as per EPA guidance, these effects are determined to be not significant in EIA terms.

#### 10.8.2.2 Vibration

Based on the type, and assumed usage of the development, it is not expected that there will be any operational vibration effects on surrounding noise sensitive receptors. As such, operational vibration effects on surrounding sensitive receptors are considered non-significant in EIA terms.

### 10.8.3 Cumulative Residual Effects

### 10.8.4 Construction Phase

#### 10.8.4.1 Noise

The cumulative construction noise effects of the Proposed Development in conjunction with other projects are considered not significant, provided the recommended mitigation measures

are fully implemented. While a worst-case scenario of simultaneous construction could lead to potential adverse effects, particularly on noise-sensitive areas like the Galway Bay Special Protection Area (SPA), this is considered unlikely due to the varying timelines and distances of the other developments. The staggered construction phases of the Proposed Development and the distance from the BusConnects and Ceannt Train Station projects (270 meters and 60-70 meters, respectively) are expected to minimize cumulative effects. The Galway Harbour extension is a source of concern due to its potential to affect the SPA, but mitigation measures outlined in its EIAR, such as avoiding high-noise activities during fish migration, will help to reduce these effects. Given the temporary and non-stationary nature of these works and the application of all mitigation strategies, the residual cumulative noise effect is determined to be not significant.

#### 10.8.4.2 Vibration

The cumulative construction vibration effects of the Proposed Development are also deemed not significant. While construction activities from the Proposed Development and other nearby projects (such as the proposed hotel) could potentially overlap, the considerable distances between sites (e.g., the hotel is 60-70 meters away) provide significant natural attenuation. Furthermore, the most intensive vibration-producing activities, like piling and demolition, are typically of a short duration. The full implementation of the mitigation measures in this chapter will ensure that any combined vibration effects are minimized, leading to a conclusion of not significant residual cumulative effects.

### 10.8.5 Operational Phase

#### 10.8.5.1 Noise

The cumulative residual effect of operational noise from the Proposed Development and other concurrent projects is concluded to be not significant. This is based on a comprehensive assessment of various noise sources and their combined long-term impact. The operational noise from the Proposed Development's on-site sources such as the crèche, external amenity areas, and café/restaurants is assessed as having an imperceptible effect on surrounding sensitive receptors. When these are combined with the operational noise from other developments like BusConnects, the Galway Harbour extension, and the proposed hotel, the cumulative effect remains not significant. The minimal changes in road traffic noise from each development and the substantial distances and screening between them ensure that the combined long-term noise effects on the surrounding area are negligible.

#### 10.8.5.2 Vibration

The operational phase of the Proposed Development is not expected to generate any perceptible vibration, nor are the other concurrent projects in the area. Therefore, the cumulative residual vibration effects during the long-term operational phase are assessed as not significant. There will be no adverse vibration conditions on the surrounding area from the combined operation of these developments.

### 10.8.6 Summary of Post-Mitigation Effects

This section outlines the summary of posit-mitigation effects of the Proposed Development on the surrounding sensitive receptors.

#### *10.8.6.1 Operational Phase*

Table 10-38 summarises the operational phase effects after mitigation. The quality of effects is neutral both noise and vibration. The noise effects are assessed as slight, which, within the binary conclusion framework, means they are not significant. The vibration effects are assessed as imperceptible, also leading to a conclusion of not significant. Both of these effects are considered long-term.

Table 10-38 summarises the identified likely significant residual effects during the construction phase of the Proposed Development following the application of mitigation measures.

#### *10.8.6.2 Construction Phase*

Following the application of mitigation measures, the likely significant residual effects during the construction phase are summarized in Table 10-37. The quality of effects is neutral for both noise and vibration. The significance of noise is assessed as slight, but based on the binary conclusion framework, it is ultimately determined to be not significant. The vibration effects are assessed as imperceptible, also resulting in a binary conclusion of not significant. Both of these effects are considered short-term.

*Table 10-37 Summary of Construction Phase Effects Post Mitigation*

| Quality | Significance | Duration | Type |
|---|---|---|---|
| Neutral | Slight | Short-Term | Noise |
| Neutral | Imperceptible | Short-Term | Vibration |

#### *10.8.6.3 Operational Phase*

Table 10-38 summarizes the operational phase effects after mitigation. The quality of effects is neutral for both noise and vibration. The noise effects are assessed as slight, which, within the binary conclusion framework, means they are not significant. The vibration effects are assessed as imperceptible, also leading to a conclusion of not significant. Both of these effects are considered long-term.

*Table 10-38 Summary of Operational Phase Effects Post Mitigation*

| Quality | Significance | Duration | Type |
|---|---|---|---|
| Neutral | Slight | Long-Term | Noise |
| Neutral | Imperceptible | Long-Term | Vibration |

## 10.9 Monitoring

This section outlines the recommended noise and vibration monitoring during the construction and operational phase of the Proposed Development.

### 10.9.1 Construction Phase

Noise and vibration monitoring will be implemented during the construction phase of the Proposed Development, particularly during the substructure works when piling operations are likely to occur. Given the proximity of multiple NSLs to the site, monitoring equipment shall be

installed at NSL 1 during phase 1 and NSL8 and NSL9 during phase 2, as these locations are closest to the anticipated construction activities. In addition, monitoring shall also be conducted to protect the surrounding SPA and SCA conservation areas.

### 10.9.2 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.

## 10.10 Interactions

This chapter has the potential to interact with the following environmental topics:

- Population and Human Health (Chapter 4);
- Biodiversity (Chapter 5); and
- Material Assets: Traffic (Chapter 12).

### 10.10.1 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.

### 10.10.2 Biodiversity

This chapter has also been developed in close liaison with the author of the Biodiversity chapter to evaluate the potential effects of noise and vibration on sensitive ecological receptors. Particular attention was given to the potential for disturbance at nearby designated sites, including the Inner Galway Bay SPA, Galway Bay Complex SAC, and Lough Corrib SAC. Biodiversity assessment data informed the assessment of potential impacts on protected species and habitats, particularly in relation to noise-sensitive periods such as breeding or foraging. This collaborative approach ensures that any required mitigation measures are appropriately aligned to safeguard both ecological and human receptors from adverse noise and vibration effects.

### 10.10.3 Material Assets: Traffic

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, in particular along Bothar na Long, a predicted increase of 1dB will be seen along Bothar na Long 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.

## 10.11 Difficulties Encountered When Compiling

There were no difficulties when compiling this chapter.

## 10.12 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 human receptors and sensitive ecological sites (SPAs/SACs), 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 and the EPA's NG4.

### 10.12.1 Construction Phase

#### *10.12.1.1 Noise*

Based on the unmitigated noise assessment, the construction phase is expected to have a significant, temporary effect on surrounding Noise Sensitive Locations (NSLs). Without mitigation, the predicted noise levels from on-site activities, such as demolition and substructure works, are likely to exceed the project criteria of 65 dB(A) LAeq,T at all NSLs, including the Harbour Hotel and residential properties.

- **Quality of Effect:** Neutral
- **Significance:** Significant
- **Duration:** Temporary
- **Probability:** Likely

However, with the implementation of the mitigation measures outlined in Section 10.6, these effects will be properly managed and reduced to acceptable levels. 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.

#### *10.12.1.2 Vibration*

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 demolition and substructure phases due to activities like piling. 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. The lack of a major vibration effect is further supported by the sequencing of works, where demolition is completed before the main construction phase begins.

- **Quality of Effect:** Neutral
- **Significance:** Not Significant (Slight)
- **Duration:** Temporary

- **Probability:** Likely

### 10.12.2 Noise and Vibration Effects on SPA/SAC Wildlife

A detailed assessment of the potential noise and vibration effects on wildlife in the nearby Galway Bay Inner SPA and other SACs has been conducted. Birds, otters, and seals are present in these areas and are sensitive to disturbance from noise. The assessment, drawing on established literature, confirms that the unmitigated noise levels could cause behavioural disturbance, particularly to sensitive species like terns and divers.

With the implementation of the proposed mitigation measures, such as noise and vibration monitoring and seasonal restrictions on certain activities, the effects on these species are predicted to be minor and temporary. The residual effect is deemed to be not significant and is adequately addressed by the proposed management plan.

- **Quality of Effect:** Negative
- **Significance:** Not Significant (Minor)
- **Duration:** Temporary
- **Probability:** Likely

### 10.12.3 Operational Phase

#### *10.12.3.1 Noise*

The assessment of operational noise sources, including the rooftop energy centre, crèche play area, and external amenity spaces, concludes that the overall effect on external sensitive receptors will be not significant. The quality of effect is neutral, and the significance is considered slight, with a likely and permanent occurrence. The louvered acoustic screen on the Block C energy centre is a core design feature that ensures external noise levels remain within acceptable limits. The noise from the crèche play area is also assessed as imperceptible and not significant due to its similarity to typical background sounds.

However, the internal noise assessment for residential units within the development, particularly those on and above the 8th floor, reveals a significant adverse effect from the energy centre. Without mitigation, internal noise levels would substantially exceed the recommended 30 dB nighttime criterion. This is a permanent and continuous effect with a likely probability of occurrence. To address this, an enhanced glazing specification and a mechanical ventilation strategy will be implemented during the detailed design stage, as outlined in the Acoustic Design Statement.

#### *10.12.3.2 Vibration*

The operational phase of the Proposed Development is not expected to generate any perceptible vibration. As there are no anticipated sources of significant vibration, the effect is concluded to be neutral in quality and imperceptible in significance. This is a permanent effect, yet its probability of occurrence is unlikely. Therefore, the operational vibration effect on surrounding NSLs will be not significant.

### 10.12.4 Overall Conclusion

The comprehensive noise and vibration assessment concludes that the Proposed Development's unmitigated construction activities will have a significant adverse effect on surrounding sensitive receptors. However, these impacts are temporary and can be effectively mitigated through the measures detailed in this chapter, reducing the final effect to a not significant level. During the operational phase, the development is not expected to cause any adverse noise or vibration effects on external receptors. The one exception is the internal noise from the rooftop plant on the upper floors of the Proposed Development itself, which will be significant without proper mitigation. A detailed design review and the implementation of enhanced glazing and a mechanical ventilation strategy will be necessary to ensure this internal effect is adequately controlled. The final residual effect of the Proposed Development will therefore be not significant with the successful implementation of all mitigation and design measures.

## 10.13 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 8233:2014 Guidance on sound insulation and noise reduction for buildings.

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.

Galway City Council Noise Action Plan 2024-2028.

ProPG 2017 Professional Practice Guidance on Planning & Noise.

AAAC: Licensed Premises Noise Assessment Technical Guideline.

NRA Traffic Grid Flow Pattern.

ISO 9613-2: 1996 (Parkplatzlarmstudio 2007).

Calculation of Road Traffic Noise (CoRTN): 1998.

Ghoul & Reichmuth (2014), which provides data on otter auditory sensitivity in both terrestrial and aquatic environments.

Romanowski et al. (2013), documenting otter use of urban riverine environments despite elevated background noise.

Kruuk, H. (2006). Otters: ecology, behaviour and conservation. OUP Oxford.

Goodship, N.M & Furness, R.W (2022) Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species.

Ruddock, M. & Whitfield, D.P (2007) A Review of Disturbance Distances in Selected Bird Species.

S.I. No. 549/2018 – European Communities (Environmental Noise) Regulations 2018 (hereafter referred to as the Noise Regulations);

S.I. No. 241/2006 - European Communities Noise Emission by Equipment for Use Outdoors (Amendment) Regulations 2006;

WHO Environmental Noise Guidelines (2019).

Galway City Development Plan 2023-2029 (see in particular Policy 9.6).

# 11 LANDSCAPE AND VISUAL ASSESSMENT

## 11.1 Introduction

This chapter assesses the potential effects of the Proposed Development on the landscape/ townscape character and visual amenity of the receiving environment. The chapter should be read in conjunction with the book of verified photomontages included in Volume III, Appendix 11-1 of the EIAR.

The Proposed Development is described in Chapter 2 (Description of the Proposed Development). The elements and aspects of the proposal most relevant to the topic of landscape/townscape and visual amenity are described in Section 11.5 of this chapter.

### 11.1.1 Quality Assurance and Competency of Experts

The landscape and visual impact assessment (LVIA) was carried out by Richard Butler MILI MIPI of Model Works Ltd. Richard has degrees in landscape architecture (BLArchHons) and town planning (MSc) and is a member of the Irish Landscape Institute and the Irish Planning Institute. He has over 25 years' experience in development and environmental planning, specialising in LVIA. In the last number of years, he has prepared LVIA EIAR chapters for the following projects among others:

- Pembroke Quarter (Irish Glass Bottle and Fabrizia sites) Phases 1, 1B, 2, A, Poolbeg West Strategic Development Zone, Dublin;
- St Vincent's Hospital and Residential Development, Fairview, Dublin;
- O'Devaney Gardens SHD, Dublin;
- Guinness Quarter, James's Street, the Liberties, Dublin;
- Project Montrose (former RTÉ lands) LRD, Donnybrook, Dublin;
- Sandford Road LRD, Dublin;
- Emmet Road SHD, Inchicore, Dublin;
- Dublin Arch (Connolly Quarter); and
- Augustine Hill (Ceannt Station), Galway.

## 11.2 Study Methodology

The LVIA was carried out with reference to:

- *Guidelines for Landscape and Visual Impact Assessment*, 3rd edition, 2013 (GLVIA), published by the Landscape Institute;
- *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*, 2022, published by the EPA; and
- *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.

For a full list of references, refer to Section 11.12.

The EPA guidelines 2022 provide a general methodology and ratings of effect significance for all EIA topics. The GLVIA provides specific guidelines for landscape and visual effects

assessment. Therefore, a combination of the EPA guidelines and the GLVIA has informed the methodology for this assessment.

### 11.2.1 Key Principles of the GLVIA

**Use of the Word 'Townscape'**

The GLVIA recommends that the word 'townscape' be used (instead of landscape) in urban areas, where a Proposed Development's receiving environment is dominated by built elements. The GLVIA defines townscape *as "the landscape within the built-up area, including the buildings, the relationships between them, the different types of urban spaces, including green spaces and the relationship between buildings and open spaces"*. Since the Proposed Development is located in the urban environment, the word townscape is generally used in this chapter.

**Assessment of Both 'Townscape' and 'Visual' Effects**

The GLVIA requires that effects on views/visual amenity be assessed separately from the effects on townscape character, although the two topics are inherently linked.

- 'Townscape' results from the interplay between the physical, natural and cultural components of our surroundings. Different combinations and spatial distribution of these elements create variations in townscape character. Townscape effects assessment identifies the changes to this character which would result from the Proposed Development and assesses the significance of those effects on the townscape as a resource; and
- Visual effects assessment is concerned with changes that arise in the composition of available views, the response of people to these changes and the overall effects on the area's visual amenity.

### 11.2.2 Methodology for Assessment of Townscape Effects

The assessment of potential townscape effects involves (a) classifying the sensitivity of the townscape, (b) classifying the potential magnitude of townscape change which would result from the Proposed Development, and (c) combining these factors to arrive at an assessment of significance of the effects - and the quality of the effects (positive, neutral or negative).

#### *11.2.2.1 Townscape Sensitivity*

The sensitivity of the townscape is a function of its character, which may be determined by its land use pattern, urban grain, building typologies and architecture, cultural and natural heritage elements (including topography, vegetation and drainage features), and the quality of the public realm. These factors determine the value that is placed on the townscape. The policy pertaining to the area (e.g. the land use zoning), and any related trend of change, are taken into account. The nature and scale of the Proposed Development are also considered (a particular townscape can have varying sensitivity to different development types). Five categories are used to classify sensitivity, as set out in (Table 11-1).

*Table 11-1 Categories of Townscape Sensitivity*

| Sensitivity | Description |
|---|---|
| **Very High** | Areas where the townscape exhibits very strong, positive character with valued elements, features and characteristics that combine to give an experience of unity, richness and harmony. The townscape character is such that its capacity to accommodate change is very low. These attributes are recognised in policy or designations as being of national or international value and the principal management objective for the area is protection of the existing character from change. |
| **High** | Areas where the townscape exhibits strong, positive character with valued elements, features and characteristics. The townscape character is such that it has limited/low capacity to accommodate change. These attributes are recognised in policy or designations as being of national, regional or county value and the principal management objective for the area is the conservation of existing character. |
| **Medium** | Areas where the townscape has certain valued elements, features or characteristics but where the character is mixed or not particularly strong, or has evidence of alteration, degradation or erosion of elements and characteristics. The townscape character is such that there is some capacity for change. These areas may be recognised in policy at local or county level and the principal management objective may be to consolidate townscape character or facilitate appropriate, necessary change. |
| **Low** | Areas where the townscape has few valued elements, features or characteristics and the character is weak. The character is such that it has capacity for change; where development would make no significant change or would make a positive change. Such townscapes are generally unrecognised in policy and the principal management objective may be to facilitate change through development, repair, restoration or enhancement. |
| **Negligible** | Areas where the townscape exhibits negative character, with no valued elements, features or characteristics. The character is such that its capacity to accommodate change is high; where development would make no significant change or would make a positive change. Such townscapes include derelict industrial lands, as well as sites or areas that are designated for a particular type of development. The principal management objective for the area is to facilitate change in the townscape through development, repair or restoration. |

**Note on definitions used in this assessment**

The definitions in Tables 11-1 (townscape sensitivity), 11-2 (magnitude of townscape change), 11-4 (viewpoint sensitivity) and 11-5 (magnitude of visual change) are not sourced from either the GLVIA or the EPA Guidelines 2022. Both of these guidance documents require that classifications of sensitivity and magnitude of change (e.g., high, medium, low, etc.) be used in the assessment process (see EPA Guidelines Figure 3.4 and GLVIA Box 3.1, Paragraph 3.26 and Figure 3.5).However, neither guidance document provides definitions for these classifications. The GLVIA specifically avoids being prescriptive in this regard (GLVIA para 1.20):

*"The guidance concentrates on principles... It is not intended to be prescriptive, in that it does not provide a detailed 'recipe' that can be followed in every situation. It is always the primary responsibility of any landscape professional carrying out an assessment to ensure that the approach and methodology adopted are appropriate to the particular circumstances."*

The EPA Guidelines state (in Section 3, p.49): *"While guidelines and standards help ensure consistency, the professional judgement of competent experts can play an important role in the determination of significance. These experts may place different emphases on the factors involved. As this can lead to differences of opinion, the EIAR sets out the basis of these*

*judgements so that the varying degrees of significance attributed to different factors can be understood."*

The GLVIA and EPA Guidelines thus require that the factors used in arriving at significance conclusions (i.e., classifications of sensitivity and magnitude) should be explained in the EIAR, but the guidelines do not provide the explanations themselves.

It is for this reason that the definitions in Tables 11-1, 11-2, 11-4 and 11-5 are provided in this section. These definitions have been developed and refined by LVIA practitioners in Ireland and the UK, including the chapter author, over decades of professional practice. They are not standardised across the industry, i.e., the definitions used in this assessment may differ from those used by other practitioners. However, the author considers them to be reasonable, transparent and appropriate for the purpose of classifying the significance of landscape/townscape and visual effects. The same definitions have been used in numerous LVIA reports and EIAR chapters prepared by the author (listed in 11.1.1 above) and accepted by the planning authorities.

#### *11.2.2.2 Magnitude of Townscape Change*

Magnitude of change is a factor of the scale, extent and degree of change imposed on the townscape by a development, with reference to its key elements, features and characteristics, and any affected surrounding character areas (also known as 'townscape receptors'). Five categories are used to classify magnitude of change (Table 11-2).

*Table 11-2 Categories of Magnitude of Townscape Change*

| Magnitude | Description |
|---|---|
| **Very High** | Change that is large in extent, resulting in the loss of or major alteration to key elements, features or characteristics of the townscape, and/or introduction of large elements considered totally uncharacteristic in the context. Such development results in fundamental change in the character of the townscape. |
| **High** | Change that is moderate to large in extent, resulting in major alteration to key elements, features or characteristics of the townscape, and/or introduction of large elements considered uncharacteristic in the context. Such development results in change to the character of the townscape. |
| **Medium** | Change that is moderate in extent, resulting in partial loss or alteration to key elements, features or characteristics of the townscape, and/or introduction of elements that may be prominent but not necessarily substantially uncharacteristic in the context. Such development results in change to the character of the landscape. |
| **Low** | Change that is moderate or limited in scale, resulting in minor alteration to key elements, features or characteristics of the townscape, and/or introduction of elements that are not uncharacteristic in the context. Such development results in minor change to the character of the townscape. |
| **Negligible** | Change that is limited in scale, resulting in no alteration to key elements features or characteristics of the townscape, and/or introduction of elements that are characteristic of the context. Such development results in no change to the townscape character. |

#### *11.2.2.3 Significance of Townscape Effects*

To classify the significance of effects the magnitude of change is measured against the sensitivity of the townscape using the guide in Table 11-3. The matrix (Table 11-3) is derived from the EPA Guidelines 2022 (Figure 11-1).

*Table 11-3 Guide to Classification of Significance of Townscape and Visual Effects*

| | | Sensitivity of the Townscape/View | | | | |
|---|---|---|---|---|---|---|
| | | **Very High** | **High** | **Medium** | **Low** | **Negligible** |
| **Magnitude of Townscape/Visual Change** | **Very High** | Profound | Profound to Very Significant | Very Significant to Significant | Moderate | Slight |
| | **High** | Profound to Very Significant | Very Significant | Significant | Moderate to Slight | Slight to Not Significant |
| | **Medium** | Very Significant to Significant | Significant | Moderate | Slight | Not Significant |
| | **Low** | Moderate | Moderate to Slight | Slight | Not significant | Imperceptible |
| | **Negligible** | Slight | Slight to Not Significant | Not significant | Imperceptible | Imperceptible |

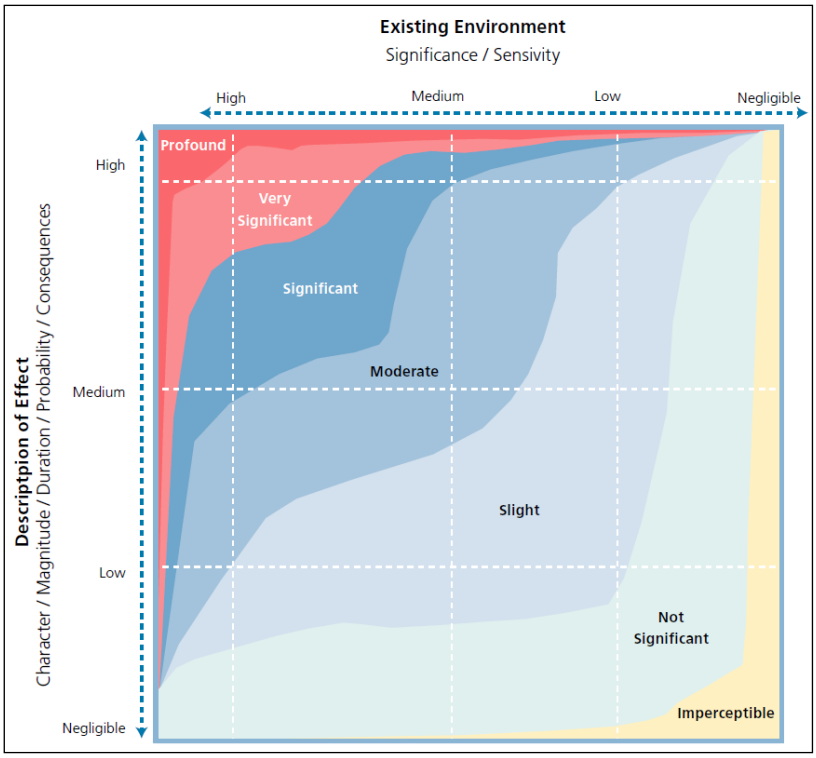



*Figure 11-1 'Chart showing typical classifications of the significance of impacts' (Source: Figure 3.4 of the EPA Guidelines 2022)*

The matrix (Table 11-3) and the EPA chart (Figure 11-1) are only a guide to the classification of effect significance. The author also uses professional judgement informed by their expertise, experience and common sense to arrive at a classification that is reasonable and justifiable. In the EPA guidelines, the chart (Figure 11-1) is accompanied by a footnote that

states: *"The depiction of significance classifications is indicative and should not be relied on as being definitive. It is provided for general guidance purposes"* (EPA guidelines Section 3, page 53). For example, according to the EPA chart a change of high magnitude affecting a receptor of medium sensitivity could be classified as either 'significant' *or* 'moderate'. That judgement must be made by the assessor.

**Binary classification of effect significance**

While the EPA Guidelines allows for classification of significance on a scale of imperceptible to profound (see Table 11-3 and Figure 11-1 above), the EIA Directive (Directive 2011/92/EU as amended by Directive 2014/52/EU) requires the identification effects as significant or not. Therefore, in Section 11.6.3.3 (Significance and Quality of Townscape Effects) and Table 11-7 (Visual Effects Summary), the affects are classified as significant or not significant.

### 11.2.3 Methodology for Assessment of Visual Effects

Assessment of visual effects involves identifying a number of key/representative viewpoints in the site's receiving environment, and for each one of these: (a) classifying the viewpoint sensitivity, (b) classifying the magnitude of change which would result in the view (informed by photomontages of the Proposed Development), and (c) combining these factors to arrive at a classification of significance of the effects on the view.

#### *11.2.3.1 Sensitivity of the Viewpoint/Visual Receptor*

Viewpoint sensitivity is a function of two main considerations:

- Susceptibility of the visual receptor to change: This depends on the occupation or activity of the people experiencing the view, and the extent to which their attention is focused on the views or visual amenity they experience at that location. Visual receptors most susceptible to change include residents at home, people engaged in outdoor recreation focused on the landscape (e.g. trail users), and visitors to heritage attractions and places of congregation where the setting contributes to the experience. Visual receptors less sensitive to change include travellers on road, rail and other transport routes (unless on recognised scenic routes), people engaged in outdoor recreation where the surrounding landscape does not influence the experience, and people in their place of work or shopping; and
- Value attached to the view: This depends to a large extent on the subjective opinion of the visual receptor but also on factors such as policy and designations (e.g. scenic routes, protected views), or the view or setting being associated with a heritage asset, visitor attraction or having some other cultural status (e.g. by appearing in arts).

Five categories are used to classify a viewpoint's sensitivity (Table 11-4):

*Table 11-4 Categories of Viewpoint Sensitivity*

| Sensitivity | Description |
|---|---|
| **Very High** | Iconic viewpoints (views towards or from a townscape feature or area) that are recognised in policy or otherwise designated as being of national value. The composition, character and quality of the view are such that its capacity for change is very low. The principal management objective for the view is its protection from change. |

| Sensitivity | Description |
|---|---|
| **High** | Viewpoints that are recognised in policy or otherwise designated as being of value, or viewpoints that are highly valued by people that experience them regularly (e.g. views from houses or outdoor recreation amenities focused on the townscape). The composition, character and quality of the view may be such that its capacity to accommodate change may or may not be low. The principal management objective for the view is its protection from change that reduces visual amenity. |
| **Medium** | Views that may not have features or characteristics that are of particular value, but have no major detracting elements, and which thus provide some visual amenity. These views may have capacity for appropriate change and the principal management objective is to facilitate change to the composition that does not detract from visual amenity, or which enhances it. |
| **Low** | Views that have no valued feature or characteristic, and where the composition and character are such that there is capacity for change. This category also includes views experienced by people involved in activities with no particular focus on the landscape. For such views the principal management objective is to facilitate change that does not detract from visual amenity or enhances it. |
| **Negligible** | Views that have no valued feature or characteristic, or in which the composition may be unsightly (e.g. in derelict landscapes). For such views the principal management objective is to facilitate change that repairs, restores or enhances visual amenity. |

#### *11.2.3.2 Magnitude of Change to the View*

Classification of the magnitude of change takes into account the size or scale of the intrusion of development into the view (relative to the other elements and features in the composition, i.e. its relative visual dominance), the degree to which it contrasts or integrates with the other elements and the general character of the view, and the way in which the change will be experienced (e.g. in full view, partial or peripheral view, or in glimpses). Five categories are used to classify magnitude of visual change to a view (Table 11-5):

*Table 11-5 Categories of Magnitude of Visual Change*

| Magnitude | Description |
|---|---|
| **Very High** | Full or extensive intrusion of the development in the view, or partial intrusion that obstructs valued features or characteristics, or introduction of elements that are completely out of character in the context, to the extent that the development becomes dominant in the composition and defines the character of the view and the visual amenity. |
| **High** | Extensive intrusion of the development in the view, or partial intrusion that obstructs valued features, or introduction of elements that may be considered uncharacteristic in the context, to the extent that the development becomes co-dominant with other elements in the composition and affects the character of the view and the visual amenity. |
| **Medium** | Partial intrusion of the development in the view, or introduction of elements that may be prominent but not necessarily uncharacteristic in the context, resulting in change to the composition but not necessarily the character of the view or the visual amenity. |
| **Low** | Minor intrusion of the development into the view, or introduction of elements that are not uncharacteristic in the context, resulting in minor alteration to the composition and character of the view but no change to visual amenity. |
| **Negligible** | Barely discernible intrusion of the development into the view, or introduction of elements that are characteristic in the context, resulting in slight change to the composition of the view and no change in visual amenity. |

#### *11.2.3.3 Significance of Visual Effects*

As for townscape effects, to classify the significance of visual effects, the magnitude of change to the view is measured against the sensitivity of the viewpoint, using the guidance in Table 11-3 and Figure 11-1. In accordance with the EIA Directive (Directive 2011/92/EU as amended by Directive 2014/52/EU), the effects on each view are also classified as significant or not significant in Table 11-7 (Visual Effects Summary).

### 11.2.4 Quality of Effects (Townscape and Visual Effects)

In addition to predicting the *significance* of the effects, EIA methodology requires that the *quality* of the effects be classified as positive/beneficial, neutral, or negative/adverse. For townscape to a degree, but particularly for visual effects, this is an inherently subjective exercise. This is because townscape and visual amenity are *perceived* by people and are, therefore, subject to variations in the attitude and values - including aesthetic preferences - of the receptor. One person's attitude to a development may differ from another person's and thus their response to the effects of a development on a townscape or view may vary.

Additionally, in certain situations there might be policy encouraging a particular development in an area, in which case the policy (of a democratically elected government or local authority) is effectively prescribing townscape and visual change. If a development achieves the objective of the policy the resulting effect might be considered positive, even if the townscape character or views are profoundly changed. The classification of quality of townscape and visual effects should seek to take these variables into account and provide a reasonable and robust assessment.

## 11.3 The Existing and Receiving Environment (Baseline Situation)

### 11.3.1 Site Location

The site is located in the centre of the Galway urban area - outside of the historic city but within the city centre as defined/zoned in the Galway City Development Plan 2023-2029 (GCDP).

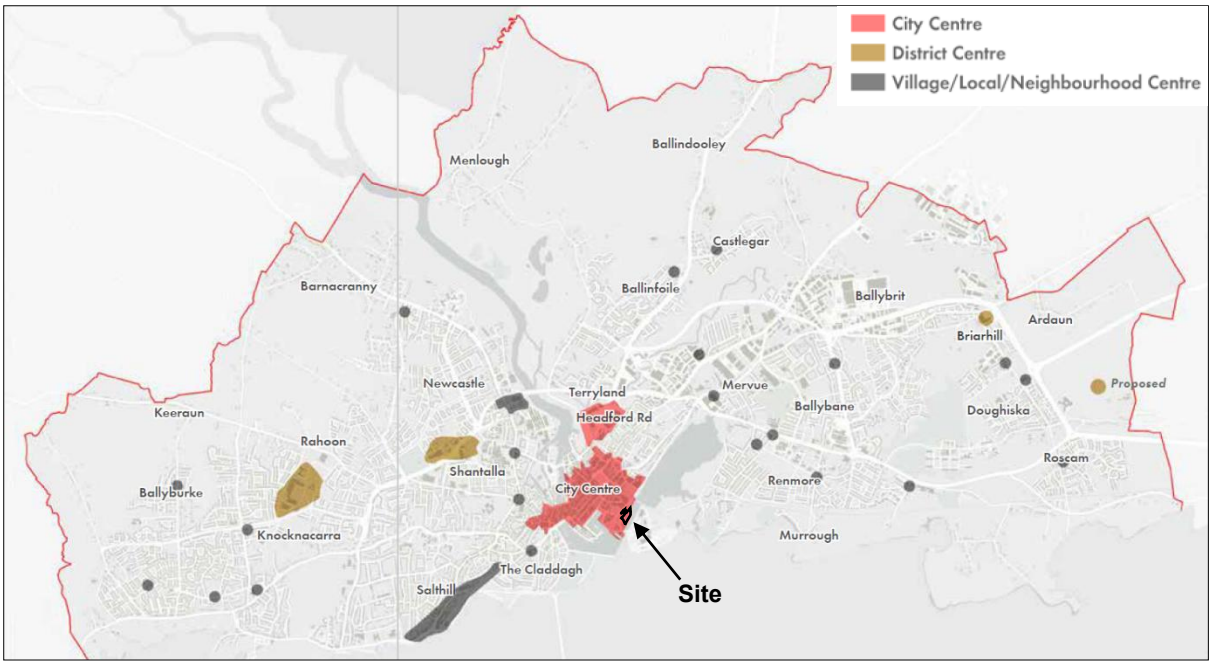



*Figure 11-2 Site location in the city context (Source: Galway Urban Density and Building Heights Study 2021, Figure 13)*

The site is in the harbour area, on the east side of Lough Atalia Road, fronting the channel to Lough Atalia. It is separated from Lough Atalia Road by another development site, but has frontage to Docks Road to the southwest, adjacent to the bridge over the Lough Atalia channel. Just to the north of the site is the railway bridge leading to Ceannt Station.

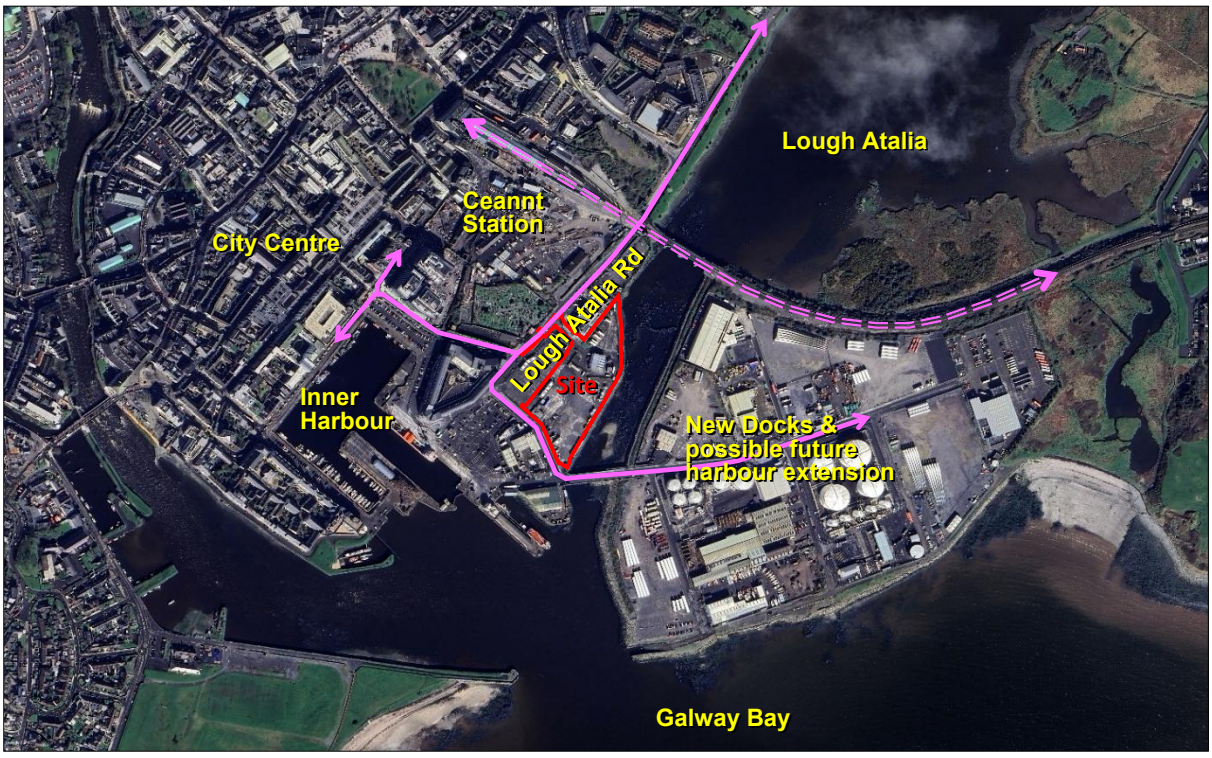



*Figure 11-3 Site Location*