

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

VOLUME II MAIN REPORT



**PROPOSED RESIDENTIAL DEVELOPMENT
AT
Folkstown, Balbriggan, Co. Dublin
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1.0 INTRODUCTION AND METHODOLOGY

John Spain Associates, Planning & Development Consultants, have been commissioned by Marshall Yards Development Company Ltd., Block C, Maynooth Business Campus, Straffan Road, Maynooth, County Kildare, a subsidiary of Glenveagh Homes Ltd., to prepare an Environmental Impact Assessment Report (EIA) for the construction of 197 no. dwellings along with 1 no. retail/café unit and 1 no. retail/medical unit, consisting of 129 no. houses, 18 no. townhouses, 16 no. duplex dwellings, 4 no. apartments, 12 no. maisonette apartments and 18 no. later living dwellings all on a site of c. 7.15 hectares. access, infrastructure, car parking, open space, boundary treatments and all associated site development works.

This chapter of the EIA was prepared by Rory Kunz, BA (MOD), MScERM, MAT&CP, Dip EIA Mgmt., Executive Director with John Spain Associates.

Rory Kunz has a Masters in Environmental Resource Management and a Diploma in EIA Management (both from UCD) as well as a Masters in Town and Country Planning. In addition, Rory is a corporate member of the of the Irish Planning Institute and has over 20 years of experience of Environmental Impact Assessment and urban development.

Rory has acted as lead planning consultant on a range of high-quality complex planning applications across the country over an extended period. Rory has wide-ranging experience in the management and review of Environmental Impact Assessment Reports (EIA) for major residential and mixed-use development and redevelopment projects.

The central purpose of the Environmental Impact Assessment Report (EIA) is to undertake an appraisal of the likely and significant impacts on the environment of the proposed development in parallel with the project design process, and to document this process in the EIA. This is then submitted to the competent/consent authority to enable it to assess the likely significant effects of the project on the environment.

A full description of the proposed development lands together with a description of the proposed development is provided in Chapter 2 of this EIA document.

This EIA document has been prepared in accordance with Directive 2011/92/EU of the European Parliament and Council of the 13th December 2011 on the assessment of the effects of certain public and private projects on the environment (codification) as amended by Directive 2014/52/EU of the European Parliament and Council of the 16th April 2014 (**'the EIA Directives'**), as well as relevant national implementing legislation, i.e. Part X of the Planning and Development Act 2000, as amended (**'the 2000 Act'**), and Part 10 of the Planning and Development Regulations 2001, as amended, (**'the 2001 Regulations'**). A description of the methodological approach to the preparation of this EIA is provided in the following sections of this chapter. A description of the methodological approach to the preparation of this EIA is provided in the following sections of this chapter.

1.1 EIA LEGISLATION, DEFINITION OF EIA AND EIA

Certain public and private projects that are likely to have significant effects on the environment are subject to EIA requirements derived from the codified European Union Directive 2011/92/EU as amended by Directive 2014/52/EU (EIA Directive). The purpose of these Directives to ensure that projects likely to have significant effects on the environment are subject to a comprehensive and systematic assessment of environmental effects prior to development consent being given.

Directive 2014/52/EU defines '*environmental impact assessment*' as a process, which includes the responsibility of the developer to prepare an Environmental Impact Assessment Report (EIA), and the responsibility of the competent authority to provide reasoned conclusions following the examination of the EIA and other relevant information.

Article 1(2)(g) of Directive 2011/92/EU, as amended by the 2014 Directive states that “*environmental impact assessment*” means 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.”

A definition of “*environmental impact assessment*” is also contained under Section 171A of the 2000 Act, as amended as follows:

‘*environmental impact assessment*’ means a process—

(a) consisting of—

- (i) the preparation of an environmental impact assessment report by the applicant in accordance with this Act and regulations made thereunder,
- (ii) the carrying out of consultations in accordance with this Act and regulations made thereunder,
- (iii) the examination by the planning authority or the Board, as the case may be, of—
 - (I) the information contained in the environmental impact assessment report,
 - (II) any supplementary information provided, where necessary, by the applicant in accordance with section 172(1D) and (1E), and
 - (III) any relevant information received through the consultations carried out pursuant to subparagraph (ii),
- (iv) the reasoned conclusion by the planning authority or the Board, as the case may be, on the significant effects on the environment of the proposed development, taking into account the results of the examination carried out pursuant to subparagraph (iii) and, where appropriate, its own supplementary examination, and
- (v) the integration of the reasoned conclusion of the planning authority or the Board, as the case may be, into the decision on the proposed development, and

(b) which includes—

- (i) an examination, analysis and evaluation, carried out by the planning authority or the Board, as the case may be, in accordance with this Part and regulations made thereunder, that identifies, describes and assesses, in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of the proposed development on the following:

- (I) population and human health;
 - (II) biodiversity, with particular attention to species and habitats protected under the Habitats Directive and the Birds Directive;
 - (III) land, soil, water, air and climate;
 - (IV) material assets, cultural heritage and the landscape;
 - (V) the interaction between the factors mentioned in clauses (I) to (IV),
- and
- (ii) as regards the factors mentioned in subparagraph (i)(I) to (V), such examination, analysis and evaluation of the expected direct and indirect significant effects on the environment derived from the vulnerability of the proposed development to risks of major accidents or disasters, or both major accidents and disasters, that are relevant to that development;

The amended Directive (Directive 2014/52/EU) uses the term environmental impact assessment report (EIAR) rather than environmental impact statement (EIS). Where current national guidelines and regulations refer to an environmental impact statement or an EIS, this can be taken to be the same as an environmental impact assessment report (EIAR).

A definition of Environmental Impact Assessment Report (EIAR) has not been included in the revised directive. However, the EPA Guidelines (2022)¹ (and the Planning and Development Act 2000 as amended) provide the following definition:

“A report or statement of the effects, if any, that the proposed project, if carried out, would have on the environment.”

The information to be included in an EIAR is specified in Article 5(1) and Annex IV of the EIA Directives (see section 1.7 below for more). The EIAR is prepared by the developer (in this instance Cairn Homes Properties Ltd.) and is submitted to a Competent Authority (CA) (in this instance Fingal County Council) as part of a consent process.

The CA uses the information provided to assess the environmental effects of the project and, in the context of other considerations, to inform its decision as to whether consent should be granted. The information in the EIAR is also used by other parties to evaluate the acceptability of the project and its effects and to inform their submissions to the CA.

The EIAR presents a systematic analysis and evaluation of the potentially significant effects of a proposed project on the receiving environment. Article 3 of the amended EIA Directive prescribes a range of environmental factors which are used to organise descriptions of the environment, and which must be addressed in the EIAR:

“The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:

population and human health;

biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;

land, soil, water, air and climate;

material assets, cultural heritage and the landscape; the interaction between the factors referred to in points (a) to (d).”

The EIAR should be prepared at a stage in the design process where changes can still be made to avoid adverse effects. This often results in the modification of the project to avoid or reduce effects through redesign.

Where significant and likely environmental effects are identified, the EIA process aims to quantify and minimise the impact development projects have on the environment through appropriate mitigation measures. The preparation of an EIAR requires site-specific considerations and the preparation of baseline assessment against which the likely impacts of a proposed development can be assessed by way of a concise, standardised and systematic methodology.

EIA practice has evolved substantially since the introduction of the EIA Directive in 1985. Practice continues to evolve and takes into account the growing body of experience in carrying out EIARs in the development sector. Table 1.1 sets out the relevant key EIA Guidance which has been consulted in the

¹ Guidelines on the Information to be contained in Environmental Impact Assessment Reports, Environmental Protection Agency, 2022

preparation of this EIAR document. In addition, the individual chapters of this EIAR should be referred to for further information on the documents consulted by each competent expert.

We would also note that the pre-application discussions with the Planning Authority informed the content of the EIAR.

Table 1.1: EIA Guidelines Consulted as Part of the Preparation of this EIAR

Irish	
<ul style="list-style-type: none"> Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, EPA, May 2022 Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment August 2018 Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licensing Systems - Key Issues Consultation Paper, Department of Housing, Planning, Community and Local Government, 2017. Circular letter PL 1/2017 - Advice on Administrative Provisions in Advance of Transposition (2017). Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (DoECLG, March 2013). Development Management Guidelines (DoEHLG, 2007). Advice Notes on Current Practice (in preparation of Environmental Impact Statements) (EPA 2003). Environmental Impact Assessment (EIA), Guidance for Consent Authorities Regarding Sub-Threshold Development (DoEHLG 2003). 	
European Union (in addition to Directives referenced above)	
<ul style="list-style-type: none"> Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report, European Commission, 2017 Environmental Impact Assessment of Projects Guidance on Screening (2017). Environmental Impact Assessment of Projects Guidance on Scoping (2017). EU Commission Notice on changes and extensions to projects (2021) Study on the Assessment of Indirect & Cumulative Impacts as well as Impact Interaction (DG Environment 2002). 	

The content of this Environmental Impact Assessment Report has been prepared in accordance with the provisions of Article 5(1) and Annex IV of Directive 2014/52/EU and Article 94 and Schedule 6 the 2001 Regulations as amended.

1.2 EIA PROCESS OVERVIEW

The main purpose of the EIA process is to identify, describe and assess the direct and indirect significant impacts of the proposed project on the environment, and specifically on the following factors:

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

The EIAR presents the results of the analysis and assessment of the significant effects of the proposed development on the receiving environment undertaken by the competent experts appointed by the developer to prepare the EIAR and sets out measures to be incorporated into the project to eliminate or minimise these impacts. .

Several interacting steps typify the early stages of the EIA process and include:

- Screening;
- Scoping;
- Assessing Alternatives; and
- Assessing and Evaluating.

Screening: Screening is the term used to describe the process for determining whether a proposed development requires an EIA.

Scoping: This stage firstly identifies the extent of the proposed development and associated site, which will be assessed as part of the EIA process, and secondly, it identifies the environmental issues likely to be important during the course of completing the EIA process having regard to the nature of the proposed development and the receiving environment and through consultation with statutory and non-statutory stakeholders. Scoping request letters were issued to a range of stakeholders at the commencement of this EIA process and the responses received have been considered as part of the compilation of the EIAR.

Assessing Alternatives: This stage describes the reasonable alternative approaches to the proposed development and sets out the main reasons for the chosen approach having regard to the effects of the respective alternatives on the environment. Consideration of alternatives is set out in Chapter 2 of this EIAR.

Assessing and Evaluating: The central steps of the EIA process include baseline assessment (desk study and field surveys) to determine the status of the existing environment, impact prediction and evaluation, and determining appropriate mitigation measures where necessary. This stage of the EIAR is presented in Chapters 3 to 15.

1.3 SCREENING – REQUIREMENT FOR EIA

Screening is the term used to describe the process for determining whether a proposed development requires an EIA by reference to mandatory legislative threshold requirements or by reference to the type and scale of the proposed development and the significance or the environmental sensitivity of the receiving baseline environment.

Annex I of the EIA Directive 85/337/EC requires as mandatory the preparation of an EIA for all development projects listed therein.

Annex II of the EIA Directive provides EU Member States discretion in determining the need for an EIA on a case-by-case basis for certain classes of project having regard to the overriding consideration that projects likely to have significant effects on the environment should be subject to EIA.

Projects needing environmental impact assessment are listed in Schedule 5 of the Planning and Development Regulations 2001 (as amended). Schedule 5 (Part 2) of the Planning & Development Regulations 2001 (as amended) set mandatory thresholds for each project class.

Paragraph 10(b)(i) refers to Infrastructure projects comprising the construction of more than 500 dwelling units. The proposed development which comprises 197 no. dwellings is below the threshold.

Paragraph 10(b)(iv) refers to 'Urban development which would involve an area greater than 2 hectares in the case of business district, 10 hectares in the case of other parts of a built-up area and 20 hectares elsewhere.' The 3-no. parcel site is c. 7.15 hectares which is below the mandatory threshold for EIA.

Paragraph 13 (a) refers to changes and extensions to development already authorised, which would result in an increase of 25% or 50 % of the appropriate threshold whichever is greater, in respect of a previous EIAR development.

The cumulative Phase 3 and Phase 4 development of c. 434 units at Ladywell/Folkstown does not breach the 500-unit threshold for the preparation of a mandatory EIAR. However, the cumulative size of the site is greater than 14.69 hectares (gross) and therefore an EIAR is being prepared.

The EIAR provides information on the receiving environment and assesses the likely significant effects of the project and proposes mitigation measures to avoid or reduce these effects. The function of the EIAR

is to provide information to allow the competent authority to conduct the Environmental Impact Assessment (EIA) of the proposed development.

1.4 SCOPING

The EPA Guidelines state that ‘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 the EC guidance² as:

“The process of identifying the content and extent of the information to be submitted to the Competent Authority under the EIA process.”

The EIAR team has extensive professional experience on undertaking similar EIAR projects on similar sites and elsewhere over an extended period.

The provisions included in the revised EIA Directive and all of the issues listed in Schedule 6, Sections 1, 2 and 3 of the Planning and Development Regulations 2001 (as amended) and in recent guidance documents have been addressed in the EIAR.

In this context the following topics/issues have been reviewed and addressed in the context of the proposed development:

- Introduction and Methodology,
- Project Description and Alternatives Examined,
- Population and Human Health,
- Biodiversity,
- Land and Soils,
- Water,
- Air Quality and Climate,
- Noise and Vibration,
- Landscape and Visual Impact,
- Material Assets - Traffic,
- Material Assets - Waste
- Material Assets - Utilities,
- Cultural Heritage – Archaeology and Architectural Heritage,
- Risk Management for Major Accidents and or Disasters,
- Interactions of the Foregoing,
- Summary of EIA Mitigation and Monitoring Measures,
- Non-Technical Summary.

In addition to the above a series of standalone reports have been prepared to accompany the application and which have helped inform the above chapters of the EIAR where relevant. Chapter 2 provides details of the envisaged phased delivery of development on the lands.

In addition, consultation has taken place with the technical staff of Fingal County Council and a consultation meeting has taken place between the Applicant.

² Environmental Impact Assessment of Projects Guidance on Scoping (Directive 2011/92/EU as amended by 2014/52/EU)

1.5 INFORMATION TO BE CONTAINED IN AN EIA

The content of this Environmental Impact Assessment Report has been prepared in accordance with the provisions of Article 5(1) and Annex IV of Directive 2014/52/EU. Article 5(1) states:

“The information to be provided by the developer shall include at least:

- (a) a description of the project comprising information on the site, design, size and other relevant features of the project;*
- (b) a description of the likely significant effects of the project on the environment;*
- (c) a description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;*
- (d) 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;*
- (e) a non-technical summary of the information referred to in points (a) to (d); and*
- (f) 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.”*

Annex IV states:

“1. A Description of the project, including in particular:

- (a) a description of the location of the project;*
- (b) a description of the physical characteristics of the whole project, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;*
- (c) a description of the main characteristics of the operational phase of the project (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used;*
- (d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation) and quantities and types of waste produced during the construction and operation phases.*

2. 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.

3. 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 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.

4. A description of the factors specified in Article 3(1) likely to be significantly affected by the project: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.

5. A description of the likely significant effects of the project on the environment resulting from, inter alia:

- (a) the construction and existence of the project, including, where relevant, demolition works;*
- (b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;*
- (c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;*
- (d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);*
- (e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;*

(f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;

(g) the technologies and the substances used.

The description of the likely significant effects on the factors specified in Article 3(1) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the project. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to the project.

6. A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.

7. A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.

8. A description of the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to Union legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or relevant assessments carried out pursuant to national legislation may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.

9. A non-technical summary of the information provided under points 1 to 8.

10. A reference list detailing the sources used for the descriptions and assessments included in the report.”

Article 94 and Schedule 6 of the Planning and Development Regulations 2001, as amended, transpose into Irish law the EIA Directive requirements in relation to information to be contained in an EIAR.

Article 94 states:

“An EIAR shall take into account the available results of other relevant assessments under European Union or national legislation with a view to avoiding duplication of assessments and shall contain—

(a) the information specified in paragraph 1 of Schedule 6,

(b) any additional information specified in paragraph 2 of Schedule 6 relevant to the specific characteristics of the development or type of development concerned and to the environmental features likely to be affected, and methods of assessment,

(c) a summary in non-technical language of the information required under paragraphs (a) and (b),

(d) a reference list detailing the sources used for the descriptions and assessments included in the report, and

(e) a list of the experts who contributed to the preparation of the report, identifying for each such expert—
(i) the part or parts of the report which he or she is responsible for or to which he or she contributed, (ii) his or her competence and experience, including relevant qualifications, if any, in relation to such parts, and (iii) such additional information in relation to his or her expertise that the person or persons preparing the EIAR consider demonstrates the expert's competence in the preparation of the report and ensures its completeness and quality.”

Schedule 6 provides for the following information to be furnished:

1. (a) A description of the proposed development comprising information on the site, design, size and other relevant features of the proposed development.

(b) A description of the likely significant effects on the environment of the proposed development.

(c) A description of the features, if any, of the proposed development and the measures, if any, envisaged to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment of the development.

(d) 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.

2. Additional information, relevant to the specific characteristics of the development or type of development concerned and to the environmental features likely to be affected, on the following matters, by way of explanation or amplification of the information referred to in paragraph 1:

(a) a description of the proposed development, including, in particular—

(i) a description of the location of the proposed development,

(ii) a description of the physical characteristics of the whole proposed development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases,

(iii) a description of the main characteristics of the operational phase of the proposed development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used, and

(iv) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation) and quantities and types of waste produced during the construction and operation phases;

(b) a description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) 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 selecting the chosen option, including a comparison of the environmental effects;

(c) a description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without the development 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;

(d) a description of the factors specified in paragraph (b)(i)(I) to (V) of the definition of 'environmental impact assessment' in section 171A of the Act likely to be significantly affected by the proposed development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape;

(e) (i) a description of the likely significant effects on the environment of the proposed development resulting from, among other things—

(I) the construction and existence of the proposed development, including, where relevant, demolition works,

(II) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources,

(III) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste,

(IV) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters),

(V) the cumulation of effects with other existing or approved developments, or both, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources,

(VI) the impact of the proposed development on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the proposed development to climate change, and

(VII) the technologies and the substances used, and

(ii) the description of the likely significant effects on the factors specified in paragraph (b)(i)(I) to (V) of the definition of 'environmental impact assessment' in section 171A of the Act should cover the direct effects and any indirect, secondary, cumulative, transboundary, short term, medium-term and long-term, permanent and temporary, positive and negative effects of the proposed development, taking into account the environmental protection objectives established at European Union level or by a Member State of the European Union which are relevant to the proposed development;

(f) a description of the forecasting methods or evidence used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information, and the main uncertainties involved;

(g) a description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of an analysis after completion of the development), explaining the extent to which significant adverse effects on the environment are avoided, prevented, reduced or offset during both the construction and operational phases of the development;

(h) a description of the expected significant adverse effects on the environment of the proposed development deriving from its vulnerability to risks of major accidents and/or disasters which are relevant to it. Relevant information available and obtained through risk assessments pursuant to European Union legislation such as the Seveso III Directive or the Nuclear Safety Directive or relevant assessments carried out pursuant to national legislation may be used for this purpose, provided that the requirements of the Environmental Impact Assessment Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for, and proposed response to, emergencies arising from such events.

Annex IV of the EIA Directive and Article 94 of the 2001 Regulations, also require that the EIAR shall, with a view to avoiding duplication of assessments, take into account the available results of other relevant assessments under Union or national legislation. The available result of other such assessments, where relevant, have been considered in each of the chapters.

The likely significant effects in this EIAR are, unless otherwise indicated in a particular Chapter, described using the terminology in Table 3.4 in the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, EPA, May 2022 (the EPA Guidelines 2022), which are presented in the Table below. The use of these terms for the classification of impacts ensures that the EIA employs a systematic approach, which can be replicated across most disciplines covered in the EIAR. The consistent application of terminology throughout the EIAR facilitates the assessment of the proposed development on the receiving environment.

Table 1.2: Description of Effects

Quality of Effects	Definition
Negative /Adverse Effects	A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem, or damaging health or property or by causing nuisance).
Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Positive	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).
Significance of Effects on the Receiving Environment	Description of Potential Effects
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant	An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.
Extent and Context of Effects	Describing the Extent and Context of Effects
Extent	Describe the size of the area, the number of sites and the proportion of a population affected by an effect.
Context	Describe whether the extent, duration or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)
Probability of Effects	Describing the Probability of Effects
Likely Effects	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Duration of Impact	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

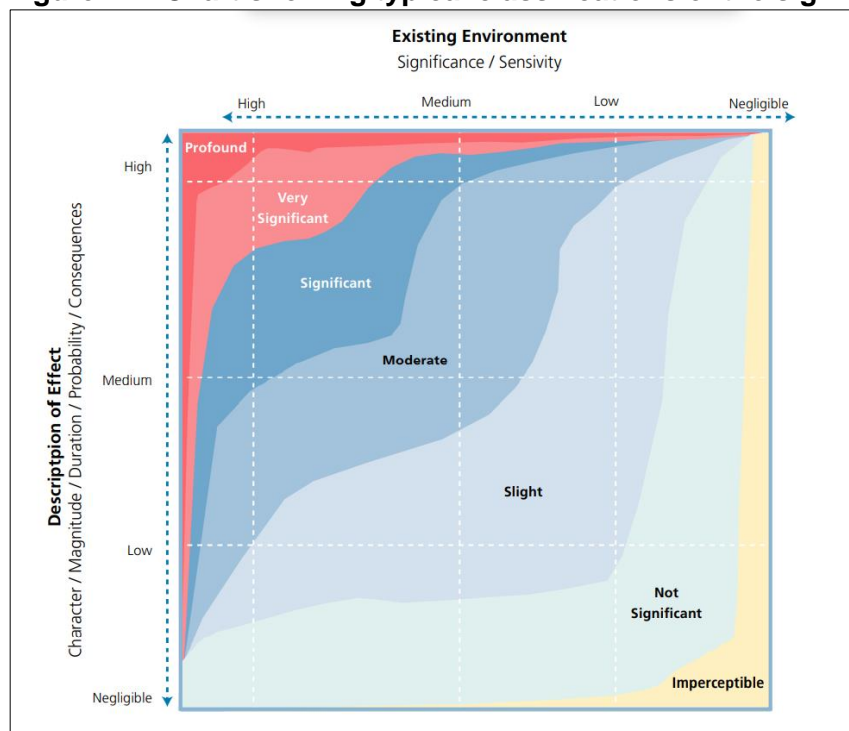
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Permanent	Effects lasting over sixty years
Reversible	Effects that can be undone, for example through remediation or restoration
Frequency of Effects	Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually):
Types of Effect	Describing the Types of Effects
Indirect Effects (a.k.a. Secondary Effects)	Effects on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
Cumulative Effects	The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects
'Do-Nothing Effects'	The environment as it would be in the future should the subject project not be carried out.
'Worst case' Effects	The effects arising from a project in the case where mitigation measures substantially fail.
Indeterminable Effects	When the full consequences of a change in the environment cannot be described
Irreversible Effects	When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
Residual Effects	The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
Synergistic Effects	Where the resultant effect is of greater significance than the sum of its constituents (e.g. combination of SO _x and NO _x to produce smog).

Source: Table 3.4 EPA Guidelines 2022

The diagram below shows how comparison of the character of the predicted impact to the sensitivity of the receiving environment can determine the significance of the impact.

Figure 1.1: Chart showing typical classifications of the significance of impacts



Source: Figure 3.4 of EPA Guidelines 2022

1.6 PURPOSE OF THIS EIAR

The EPA Guidelines 2022 state that the main purpose of an EIAR *‘is to identify, describe and present an assessment of the likely significant effects of a project on the environment’*. This informs the competent authority’s assessment process, its decision on whether to grant consent for a project and, if granting consent, what conditions to attach. The EIAR focuses on:

- *effects that are both likely and significant; and;*
- *description of effects that are accurate and credible.*

In addition to identifying and predicting the likely predicted significant environmental impacts resulting from the proposed development, the EIAR should describe the means and extent by which they can be reduced or ameliorated, to interpret and communicate information about the likely impacts and to provide an input into the decision making and planning process.

The EIAR documents the consideration of environmental effects that influenced the evaluation of alternatives. It also documents how the selected project design incorporates mitigation measures; including impact avoidance, reduction or amelioration; to explain how significant adverse effects will be avoided.

It is intended that this EIAR will assist Fingal County Council (the competent authority) statutory consultees and the public in assessing all aspects of the application proposals.

1.7 OBJECTIVES OF THIS EIAR

The EPA guidelines (2022) list the following fundamental principles to be followed when preparing an EIAR:

- Anticipating, predicting, avoiding and reducing significant effects;
- Assessing and mitigating effects;
- Maintaining objectivity;
- Ensuring clarity and quality;
- Providing relevant information to decision makers; and
- Facilitating better consultation.

The amended EIA Directive prescribes a range of environmental factors which are used to organise descriptions of the environment and the environmental impact assessment should identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the prescribed environmental factors which are:

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

This EIAR documents the analysis, evaluation and assessment of the likely significant effects of the proposed mixed-use development at Emmet Road, Inchicore, Dublin 8 on each of these environmental factors.

Pursuing preventative action is the most effective means by which potential negative environmental impacts can be avoided. Avoidance of impacts has been principally achieved through the consideration of

alternatives and through the review of the project design in light of identified key environmental constraints. This is outlined in greater detail in Chapter 2.

The EIAR document enables Fingal County Council, as competent authority, to reach a decision on the acceptability of the proposed development in the full knowledge of the project's likely significant impacts on the environment, if any.

Decisions are taken by competent/consent authorities through the statutory planning process which allows for public participation and consultation while receiving advice from other key stakeholders and statutory authorities with specific environmental responsibilities.

The structure, presentation and the non-technical summary of the EIAR document 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 any likely environmental impacts of projects prior to the granting of consent.

1.8 FORMAT AND STRUCTURE OF THIS EIAR

The structure of the EIAR is laid out in the preface of each volume for clarity. It consists of three volumes as follows:

- Volume I: Non-Technical Summary

This is a non-technical summary of the information contained within Volume II.

- Volume II: Environmental Impact Assessment Report.

This is the main volume of the EIAR. It provides information on the location and scale of the proposed development, details on design and impacts on the environment (both positive and negative) as a result of the proposed development.

Each of the environmental aspects as listed below are examined in terms of the existing or baseline environment, identification of potential construction and operational stage impacts and where necessary proposed mitigation measures are identified. The interaction of the environmental aspects with each other is also examined. Each chapter below includes an assessment of potential cumulative impacts with other existing and planned developments, where relevant. Environmental aspects considered include:

Chapter 3	Population and Human Health;
Chapter 4	Biodiversity;
Chapter 5	Land and Soils;
Chapter 6	Water;
Chapter 7	Air Quality;
Chapter 8	Climate;
Chapter 9	Noise and Vibration;
Chapter 10	Landscape & Visual;
Chapter 11	Material Assets – Traffic;
Chapter 12	Material Assets – Utilities;
Chapter 13	Material Assets - Waste Management;
Chapter 14	Cultural Heritage – Local History, Archaeology;
Chapter 15	Risk Management for Major Accidents and or Disasters;
Chapter 16	Interactions of the Foregoing;
Chapter 17	Summary of EIA Mitigation and Monitoring Measures;

- Volume III: Technical Appendices

Volume III contains specialists' technical data and other related reports.

1.8.1 EIA VOLUME II STRUCTURE

The preparation of an EIA document requires the assimilation, co-ordination, and presentation of a wide range of relevant information in order to allow for the overall assessment of a proposed development. For clarity and to allow for ease of presentation and consistency when considering the various elements of the proposed development, a systematic structure is used for the main body of this EIA document.

The structure used in this EIA document is a Grouped Format structure. This structure examines each environmental topic³ in a separate chapter of this EIA document. The structure of the EIA document is set out in Table 1.3 below.

Table 1.3: Structure of this EIA

Chapter	Title	Content
1	Introduction and Methodology	Sets out the purpose, methodology and scope of the document.
2	Project Description and Alternatives Examined	Sets out the description of the site, design and scale of development, considers all relevant phases from construction through to existence and operation together with a description and evaluation of the reasonable alternatives studied by the developer including alternative locations, designs and processes considered; and a justification for the option chosen taking into account the effects of the project on the environment.
3	Population and Human Health	Describes the demographic and socio-economic profile of the receiving environment and potential impact of the proposed development on population, i.e. human beings, and human health.
4	Biodiversity	Describes the existing ecology on site and in the surrounding catchment and assesses the potential impact of the proposed development and mitigation measures incorporated into the design of the scheme and includes mitigation measures.
5	Land and Soils	Provides an overview of the baseline position, the potential impact of the proposed development on the site's soil and geology and impacts in relation to land take and includes mitigation measures.
6	Water	Provides an overview of the baseline position, the potential impact of the proposed development on water quality and quantity and includes mitigation measures.
7	Air Quality	Provides an overview of the baseline air quality environment, the potential impact of the proposed development and includes mitigation measures.
8	Climate	Provides an overview of the baseline climatic environment, the potential impact of the proposed development, the vulnerability of the project to climate change, and includes mitigation measures.
9	Noise and Vibration	Provides an overview of the baseline noise environment, the potential impact of the proposed development and includes mitigation measures.
10	Landscape & Visual Impact	Provides an overview of the baseline position, the potential impact of the proposed development on the landscape appearance and character and visual environment and includes mitigation measures.

³ In some instances similar environmental topics are grouped.

Chapter	Title	Content
11-13	Material Assets	Describes the existing traffic, waste management and services and infrastructural requirements of the proposed development and the likely impact of the proposed development on material assets and includes mitigation measures.
14	Archaeology and Architectural and Cultural Heritage	Provides an assessment of the site and considers the potential impact of the proposed development on the local archaeology, architectural and cultural heritage; and includes mitigation measures.
15	Risk Management	Provides a review of the potential vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned
16	Interactions of the Foregoing	Describes the potential interactions and interrelationships between the various environmental factors.
17	Summary of Mitigation and Monitoring Measures	Sets out the key mitigation and monitoring measures included in the EIAR Document for ease of reference.

This systematic approach described above employs standard descriptive methods, replicable assessment techniques and standardised impact descriptions to provide an appropriate evaluation of each environmental topic under consideration. An outline of the methodology employed consistently in each chapter to examine each environmental topic is provided below:

Table 1.4: Methodology Employed to Evaluate Environmental Topic

- Introduction:
- Study Methodology:
- The Existing Receiving Environment (Baseline Situation):
- Do Nothing Scenario:
- Characteristics of the Proposed Development:
- Potential Impact of the Proposed Development:
- Avoidance, Remedial and Mitigation Measures: Avoidance:
- Predicted Impacts of the Proposed Development (Assessing the significance of residual effects, taking account of any mitigation measures):
- Monitoring:
- Reinstatement:
- Interactions and Cumulative Impacts:
- Difficulties Encountered in Compiling:
- References.

1.9 EIAR PROJECT TEAM

1.9.1 EIAR PROJECT MANAGEMENT

The preparation of this EIAR was project managed, co-ordinated and produced by John Spain Associates. John Spain Associates role was to liaise between the design team and various environmental specialist consultants. John Spain Associates were also responsible for editing the EIAR document to ensure that it is cohesive and not a disjointed collection of disparate reports by various environmental specialists. John Spain Associates does not accept responsibility for the input of the competent specialist consultants or the design team.

1.9.2 EIAR COMPETENT EXPERTS/ENVIRONMENTAL SPECIALISTS

Recital 33 of the amended EIA Directive (Directive 2014/52/EU) states the following in relation to the persons responsible for preparing the environmental impact assessment reports:

‘Experts involved in the preparation of environmental impact assessment reports should be qualified and competent. Sufficient expertise, in the relevant field of the project concerned, is required for the purpose of its examination by the competent authorities in order to ensure that the information provided by the developer is complete and of a high level of quality’.

Article 5(3) of the EIA Directive (Directive 2014/52/EU) obliges the project developer to "ensure that the environmental impact assessment report is prepared by competent experts". To demonstrate compliance with this, Article 94(e) of the Planning and Development Regulations 2001 to 2021 requires the developer to include the following information in the EIAR:

a list of the experts who contributed to the preparation of the report, identifying for each such expert—

- (i) the part or parts of the report which he or she is responsible for or to which he or she contributed,*
- (ii) his or her competence and experience, including relevant qualifications, if any, in relation to such parts, and*
- (iii) such additional information in relation to his or her expertise that the person or persons preparing the EIAR consider demonstrates the expert's competence in the preparation of the report and ensures its completeness and quality.*

Each environmental specialist engaged in the preparation of this EIAR was commissioned having regard to their previous experience in EIA; their knowledge of relevant environmental legislation relevant to their topic; familiarity with the relevant standards and criteria for evaluation relevant to their topic; ability to interpret the specialised documentation of the construction sector and to understand and anticipate how their topic will be affected during construction and operation phases of development; ability to arrive at practicable and reliable measure to mitigate or avoid adverse environmental impacts; and to clearly and comprehensively present their findings.

Each environmental specialist was required to characterise the receiving baseline environment; evaluate its significance and sensitivity; predict how the receiving environment will interact with the proposed development and to work with the EIA project design team to devise measures to mitigate any adverse environmental impacts identified.

The relevant specialist consultants who contributed to the EIAR and their inputs are set out in Table 1.5 below.

Table 1.5: EIAR List of Competent Experts

Organisation	EIAR Specialist Topics / Inputs
John Spain Associates, Planning & Development Consultants, 39 Fitzwilliam Place, Dublin 2, D02 ND61 T: 01 662 5803 Rory Kunz, BA (MOD), MScERM, MAT&CP, Dip EIA Mgmt	Introduction and Methodology Project Description and Alternatives Examined Population and Human Health Interactions of the Foregoing Principal Mitigation and Monitoring Measures Non-Technical Summary
Openfield, Padraic Fogarty, MSc, MIEMA MSc from Sligo Institute of Technology for research into Ecological Impact Assessment (EclA) in Ireland. OPENFIELD is a full member	Biodiversity

of the Institute of Environmental Management and Assessment (IEMA) Bran Keeley – Bat Specialist BSc Zoology	
Luke Maguire Environmental Consultant and Geoscientist (BSc) at AWN Consulting. Teri Hayes (BSc MSc PGeol EurGeol) Senior Hydrogeologist and director at AWN Consulting	Land and Soils/ Population and Human Health
Luke Maguire Environmental Consultant and Geoscientist (BSc) at AWN Consulting. Teri Hayes (BSc MSc PGeol EurGeol) Senior Hydrogeologist and director at AWN Consulting	Water and Hydrogeology
Eoin Munn, Transport Insights. BSc Transport Operations, Technological University Dublin (2003-2007) MSc Business Analytics, University College Dublin (2007-2008) Member, Transport Planning Society (MTPS) Jurek Gozdek BScEng (Transport Engineering), Warsaw University of Technology (2017) MSc (Geographic Information Science), Technological University Dublin (2021) Narendra Jillelamudi. B.Tech in Civil Engineering, Acharya Nagarjuna University (2012-2016) M.Tech in Traffic and Transportation Planning, NIT Calicut (2017-2019)	Material Assets-Traffic
Chonaill Bradley (Bsc ENV,PG Dip Circ Econ, AssocCIWM) of AWN Consulting	Material Assets (Waste Management)
Paul McGrail, Managing Director of Paul McGrail Consulting Engineers, graduated from Bolton Street DIT in 1999. Chartered Engineer with Engineers Ireland.	Material Assets (Utilities)
Aisling Cashell, an Environmental Consultant. BA and an MAI in Civil, Structural and Environmental Engineering from Trinity College Dublin. Dr. Jovanna Arndt, a Senior Environmental Consultant	Air Quality (Population and Human Health)
Aisling Cashell, an Environmental Consultant. BA and an MAI in Civil, Structural and Environmental Engineering from Trinity College Dublin. Dr. Jovanna Arndt, a Senior Environmental Consultant	Climate (Population and Human Health)
Alistair Maclaurin. Alistair holds a BSc, Diploma in Acoustics and Noise Control. Member of the Institute of Acoustics (MIOA).	Noise and Vibration (Population and Human Health)
Richard Butler of Model Works Ltd. Degrees in Landscape Architecture and Town Planning and is a member of the Irish Landscape Institute and the Irish Planning Institute.	Landscape and Visual Impacts
IAC, Faith Bailey MA, BA (Hons), MCIfA Associate Director	Archaeology, Architectural and Cultural Heritage
Eamonn Doran DCA MRAI	Risk Management

1.10 NON-TECHNICAL SUMMARY

One of the objectives of the EIA process is to ensure that the public are fully aware of the environmental implications of any decisions. Article 5(1)(e) requires the developer to include a non-technical summary in the EIAR.

The EPA guidelines 2022 note that the non-technical summary of the EIAR should facilitate the dissemination of the information contained in the EIAR and that the core objective is to ensure that the public is made as fully aware as possible of the likely environmental impacts of projects prior to a decision being made by the Competent Authority.

The 2018 EIA Guidelines (paragraph 4.6) prepared by the DHPLG state that the Non-Technical Summary *“should be concise and comprehensive and should be written in language easily understood by a lay member of the public not having a background in environmental matters or an in-depth knowledge of the proposed project.”*

A Non-Technical Summary of the EIAR has therefore been prepared which summarises the key environmental impacts and is provided as a separately bound document in Volume I.

1.11 DESCRIPTION OF THE OPERATION STAGE OF THE PROJECT

Pursuant to the EIA Directive an EIAR document is required to set out a description of the project processes, activities, materials, and natural resources utilised; and the activities, materials and natural resources and the effects, residues and emissions anticipated by the operation of the project.

The proposed development is a residential development including associated roads and services infrastructural works, areas of open space. The primary direct significant environmental effects will arise during the construction stage. As a result, post-construction, the operation of the proposed development is therefore relatively benign and not likely to give rise to any significant additional impacts in terms of activities, materials or natural resources used or effects, residues or emissions which are likely to have a significant impact on population and human health, biodiversity, soils, water, air, climate, or landscape.

The primary likely and significant environmental impacts of the operation of the proposed development are fully addressed in the EIAR document; and relate to Population and Human Health, Landscape and Visual Impact and Noise and Air impacts associated with the traffic generated.

The proposed development also has the potential for cumulative, secondary, and indirect impacts particularly with respect to such topics as traffic – which in many instances – are often difficult to quantify due to complex inter-relationships. However, all cumulative secondary and indirect impacts are unlikely to be significant; and where appropriate, have been addressed in the content of this EIAR document.

1.11.1 DESCRIPTION OF CHANGES TO THE PROJECT

The Guidelines on the information to be contained in environmental impact assessment reports were published by the EPA in May 2022.

The EPA EIAR Guidelines 2022 state in relation to change:

“Very few projects remain unaltered throughout their existence. Success may bring growth; technology or market forces may cause processes or activities to alter. All projects change and – like living entities – will someday cease to function. The life cycles of some types of projects, such as quarries, are finite and predictable. Such projects often consider their closure and decommissioning in detail from the outset, while for most projects a general indication of the nature of possible future changes may suffice. While the examination of the potential consequences of change (such as extension) does not imply permission for such extension, its identification and consideration can be an important factor in the determination of the application. Descriptions of likely changes may cover:

- *Extension*
- *Decommissioning*
- *Other Changes.”*

As per the EPA guidelines and in the interests of proper planning and sustainable development it is important to consider the potential future growth and longer-term expansion of a proposed development in order to ensure that the geographical area in the vicinity of the proposed development has the assimilative carrying capacity to accommodate future development.

Given the proposed site layout extent and the limitations of physical boundaries, adjoining land uses and land ownership the potential for growth of the proposed development is considered limited and confined primarily to potential minor domestic extensions which will have a negligible impact.

The parameters for the future development of the area in the vicinity of the subject site are governed by the Fingal County Development Plan 2023-2029. Any adjacent undeveloped lands will be the subject of separate planning applications in the future, where they are identified as being suitable for development, and where the provision of the requisite physical and other infrastructure is available.

1.11.2 DESCRIPTION OF SECONDARY AND OFF-SITE DEVELOPMENTS

No significant secondary enabling development is deemed necessary to facilitate the proposed development. The planning application includes details of the necessary road works, which are required to facilitate this development. These works are assessed within this Environmental Impact Assessment Report.

1.11.3 RISKS OF MAJOR ACCIDENTS AND/OR DISASTERS

The surrounding context consists of a mix of residential, agricultural, employment, educational and open space public amenity lands. It does not include any man-made industrial processes (including SEVESO II Directive sites (96/82/EC & 2003/105/EC) which would be likely to result in a risk to human health and safety.

Article 3 of the Environmental Impact Assessment (EIA) Directive 2014/52/EU requires the assessment of expected effects of major accidents and/or disasters within an EIA. Article 3(2) of the Directive states that:

“The effects referred to in paragraph 1 on the factors set out therein shall include the expected effects deriving from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned”.

Chapter 15 of the EIAR provides further detail and an assessment.

1.11.4 CONSTRUCTION PHASE MITIGATION

With reference to the construction phase of the proposed development, the objective of the *Resource & Waste Management Plan*, included with the application, is to ensure that waste generated during the proposed construction and operation phases will be managed and disposed of in a way that ensures the provisions of the Waste Management Acts 1996 (as amended) are complied with.

During the construction stage, the risk of accidents associated with the proposed development are not predicted to cause unusual, significant or adverse effects to the existing public road network. The vast majority of the works (save for the upgrade works to the junction) are away from the public road in a controlled environment.

There will be some short-term impacts during the construction phase as the pipes are laid, particularly in respect of traffic management with regards to sensitive receptors. This may cause local short-term inconvenience and disturbance to residents and business in the vicinity of the works. However, the works would normally be undertaken in sections on a phased/rolling programme so that the number of persons experiencing local inconveniences at any one time is kept to a minimum.

Furthermore, it is expected that the risk of accidents would be low during the construction of the proposed development considering the standard construction practices which are to be used.

With reference to the operational phase of the development the design of the scheme has had regard to DMURS during its design. This will promote a pedestrian friendly environment, promoting sustainable development and reducing the influence of cars. This has the potential to reduce accidents within the proposed development.

With reference to natural disasters (e.g. flooding), the proposed development has undergone a Site-Specific Flood Risk Assessment, prepared by Paul McGrail Consulting Engineers. The main area of the site where development is proposed is not at risk of fluvial, pluvial or groundwater flooding.

1.12 RELATED DEVELOPMENT AND CUMULATIVE IMPACTS

The proposed development also has the potential for cumulative, secondary and indirect impacts particularly with respect to such topics as traffic which in many instances are often difficult to quantify due to complex inter-relationships. All cumulative, secondary and indirect impacts are unlikely to be significant and, where appropriate, have been addressed in the content of this EIA document.

Each Chapter of the EIA includes a cumulative impact assessment of the proposed development with other permitted projects in the immediate area. The potential cumulative impacts primarily relate to traffic, dust, noise, and other nuisances from the construction of the development, with other planned or existing projects, and each of the following EIA chapters has regard to these in the assessment and mitigation measures proposed.

As such, with the necessary mitigation for each environmental aspect, it is anticipated that the potential cumulative impact of the proposed development in conjunction with the other planned developments will be minimal.

For the noise impact assessment in Chapter 8 the potential noise emissions arising from the proposed development during construction and operation are combined (using cumulative AADT figures from Traffic chapter) with background noise levels (predominantly road traffic) were assessed.

Each of the relevant specialists has considered the potential for cumulative impact in preparing their assessments, where relevant. While there is the potential for negative impacts to occur during the construction stage of the scheme, with the implementation of the appropriate mitigation outlined in the EIA, the residual cumulative impact is not considered to be significant.

Should any other developments be under construction or planned in the vicinity of the site, potential cumulative impacts are not anticipated once similar mitigation measures are implemented.

Relevant developments have been identified with regard to their size and scale, their use mix and composition, and their proximity to the proposed development, within the settlement of Balbriggan, in particular to identify any substantial / strategic residential development or larger scale commercial development. Applications of a minor nature were discounted from the planning history search, for example applications for under 5 no. dwellings, or applications relating to minor extensions, works to existing dwellings, and change of use applications. The planning history search focussed on relevant permitted developments in the last 5 years, with a search also undertaken for permitted longer term permissions (i.e. with a 10-year permission).

Other projects in the wider area comprise:

Planning Reg. Ref. ABP-312048-21 (F21A/0055) – Phase 3A Ladywell

On the 13th of October 2023, An Bord Pleanála upheld the decision of Fingal County Council and granted permission for phase 3A as part of the overall phase 3 at Ladywell comprising 99 no. dwellings open space and services and road layout for phases 3A-3D.

Planning Reg. Ref. F22A/0526 – Phase 3B Ladywell

Under Planning Reg. Ref. F22A/0526 Fingal County Council granted permission for phase 3B as part of the overall phase 3 at Ladywell which comprises 95 no. dwellings open space and services and road layout for phases 3A-3D.

Planning Reg. Ref. F22A/0670 - Phase 3C Ladywell

On the 5th of July 2023, Fingal County Council granted permission for development on the Phase 3C lands comprising 75 units open space and services and road layout for phases 3A-3D.

Planning Reg. Ref. LRD0006/S3 ABP Reg. Ref. LH06F.319343

On the 9th of July 2024 an Bord Pleanála overturned Fingal County Council's decision to refuse permission and granted permission for inter alia:

- (i) The demolition of an existing single storey dwelling (151sq.m) (Eircode K32 KR40), associated single-storey storage shed (14.9sq.m), and larger single-storey agricultural shed outbuilding (366sq.m), all of which are located to the south of Flemington Lane.
- (ii) The construction of 564 no. dwelling units, consisting of 378 no. houses ranging in height from two to three storeys (127 no. terraced two-bedroom houses; 5 no. three-bedroom detached houses; 156 no. three-bedroom semi-detached houses; 76 no. three-bedroom terraced houses; and 14 no. four-bedroom detached houses); 28 no. duplex blocks, ranging in height from two to three storeys, comprising 84 no. duplex units (22 no. one-bedroom duplexes, 36 no. two-bedroom duplexes and 26 no. three-bedroom duplexes) and 10 no. apartment blocks (FM1, FM2, M1, M2, FP1, HN1, HC1, HC2, HC3, and HS1) ranging in height from three to five storeys, comprising 102 no. apartments (35 no. one-bedroom apartments and 67 no two-bedroom apartments).

F22A/0033

Lands at Harvest Lodge, Folkstown Lane (Folkstown Little Td) and lands at Folkstown Great Td, Naul Road, Balbriggan, Co Dublin.

1. The development will consist of a distillery (total floor area of floor area 5659m²) which includes provision of an ancillary visitor centre, storage shed along with associated external plant.

Final Grant 10th February 2023

F22A/0480

Stephenstown Industrial Estate, Balbriggan, Dublin

The development will principally comprise the construction of a two-storey warehouse unit with ancillary office and staff facilities and associated development as well as a single storey garage. The warehouse unit will have a maximum height of 14.78 metres with a gross floor area of 1,996 sq m including warehouse area (1,670 sq m), ancillary staff facilities (184 sq m) and ancillary office area (142 sq m). The garage will have a maximum height of 14.358 metres and a gross floor area of 500sq m.

Final Grant 5th April 2023.

As such, with the necessary mitigation for each environmental aspect, it is anticipated that the potential cumulative impact of the proposed development in conjunction with the other permitted developments will be minimal.

To determine traffic impacts in Chapter 10 the traffic generated by the proposed development is combined with the baseline traffic generated by the traffic on the road network in the area. The potential traffic impacts from other developments were also considered in the assessment (e.g. sites adjacent).

For the noise impact assessment in Chapter 8 the potential noise emissions arising from the proposed development during construction and operation are combined (using cumulative AADT figures from Traffic chapter) with background noise levels (predominantly road traffic) were assessed.

Each of the relevant specialists has considered the potential for cumulative impact in preparing their assessments. While there is the potential for negative impacts to occur during the construction stage of the scheme, with the implementation of the appropriate mitigation outlined in the EIAR, the residual cumulative impact is not considered to be significant.

Each Chapter of the EIAR includes a cumulative impact assessment of the proposed development with other planned projects in the immediate area. The potential cumulative impacts primarily relate to traffic, dust, noise and other nuisances from the construction of the development, with other planned or existing projects, and each of the following EIAR chapters has regard to these in the assessment and mitigation measures proposes.

As such, with the necessary mitigation for each environmental aspect, it is anticipated that the potential cumulative impact of the proposed development in conjunction with the other planned developments will be minimal. Future development on lands to the west at Mallin Cross will include Ladywell as part of its cumulative assessment and would be subject to separate mitigation measures.

1.13 DIRECT AND INDIRECT EFFECTS RESULTING FROM USE OF NATURAL RESOURCES

Details of significant direct and indirect effects arising from the proposed development are outlined in Chapters 3-16 which deal with '*Aspects of the Environment Considered*'. No significant adverse impact is predicted to arise from the use of natural resources.

1.14 DIRECT AND INDIRECT EFFECTS RESULTING FROM EMISSION OF POLLUTANTS, CREATION OF NUISANCES AND ELIMINATION OF WASTE

Details of emissions arising from the development together with any direct and indirect effects resulting from same have been comprehensively assessed and are outlined in the relevant in Chapters 3-16 which deal with '*Aspects of the Environment Considered*'. There will be no significant direct or indirect effects arising from these sources.

1.15 FORECASTING METHODS USED FOR ENVIRONMENTAL EFFECTS

The methods employed to forecast, and the evidence used to identify the significant effects on the various aspects of the environment are standard techniques used by each of the particular individual disciplines. The general format followed was to identify the receiving environment, to add to that a projection of the "*loading*" placed on the various aspects of the environment by the development, to put forward amelioration measures, to lessen or remove an impact and thereby arrive at net predicted impact.

Where specific methodologies are employed for various sections of the EIAR they are referred to in the Receiving Environment (Baseline Scenario) sections in the EIAR. Some of the more detailed/specialised information sources and methodologies for several the environmental assessments are outlined hereunder.

1.16 TRANSBOUNDARY IMPACTS

Large-scale transboundary projects⁴ are defined as projects which are implemented in at least two Member States or having at least two Parties of Origin, and which are likely to cause significant effects on the environment or significant adverse transboundary impact.

Having regard to the nature and extent of the proposed development, which comprises a residential development, located in development boundary of Balbriggan, within the administrative area of Fingal County Council, transboundary impacts on the environment are not considered relevant, in this regard.

1.17 LINKS BETWEEN EIA AND APPROPRIATE ASSESSMENT/NIS

Article 6(3) of the Habitats Directive (92/43/EEC) provides that any project not directly connected with or necessary to the management of a Natura 2000 site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to an Appropriate Assessment of its implications for the site in view of the site's conservation objectives.

In January 2010 the DoEHLG issued a guidance document entitled '*Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities*'. This guidance document enshrines the '*Source-Pathway-Receptor*' into the assessment of plans and projects which may have an impact on Natura 2000 sites.

An Appropriate Assessment screening by Openfield was carried out in accordance with '*Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites – Methodological Guidance on the Provisions of Article 6 (3) and (4) of the Habitats Directive 92/43/EEC*' - Brussels, 28.9.2021 C(2021) 6913 final. The AA Screening and NIS is included with the LRD application.

In accordance with these Guidelines, the Appropriate Assessment may be a separate document or form part of the EIAR. In the case of the proposed development a separate Appropriate Assessment Screening Report is submitted with this application as a standalone report and referenced in the Biodiversity Chapter, prepared by Openfield.

Article 5(1) of the Directive also states that the EIAR shall include the information that may reasonably be required for reaching a reasoned conclusion on the significant effects of the project on the environment, taking into account current knowledge and methods of assessment. The developer shall, with a view to avoiding duplication of assessments, take into account the available results of other relevant assessments under Union or national legislation, in preparing the environmental impact assessment report.

In this regard a brief account of how the results of other relevant assessments considered in the preparation of this EIAR is included as Appendix B Volume III of the EIAR.

1.18 AVAILABILITY OF EIAR DOC

A copy of this EIAR document and Non-Technical Summary of the EIAR document is available for purchase at the offices of Fingal County Council (Planning Authority) at a fee not exceeding the reasonable cost of reproducing the document. It can also be viewed on the LRD website: www.FolkstownLRD.ie set up by the applicant.

⁴ The definition is based on Articles 2(1) and 4 of the EIA Directive and Article 2(3) and (5) of the Espoo Convention, respectively. <http://ec.europa.eu/environment/eia/pdf/Transboundry%20EIA%20Guide.pdf>

1.19 IMPARTIALITY

This EIAR document has been prepared with reference to a standardised methodology which is universally accepted and acknowledged. Recognised and experienced environmental specialists have been used throughout the EIA process to ensure the EIAR document produced is robust, impartial and objective.

1.20 STATEMENT OF DIFFICULTIES ENCOUNTERED

No particular difficulties, such as technical deficiencies or lack of knowledge, were encountered in compiling any of the specified information contained in this statement, such that the prediction of impacts has not been possible. Where any specific difficulties were encountered these are outlined in the relevant chapter of the EIAR.

1.21 EIA QUALITY CONTROL AND REVIEW

John Spain Associates is committed to consistently monitoring the quality of EIAR documents prepared both in draft form and before they are finalised, published and submitted to the appropriate competent authority taking into account latest best-practice procedure, legislation and policy. The EPA published draft guidelines on information to be contained in Environmental Impact Assessment Report⁵ and the Department of Housing, Planning, Community and Local Government have published a consultation paper⁶, which have been consulted in the preparation of this EIAR. This document includes a detailed EIAR Review Checklist which has been used to undertake a review of this EIAR document.

1.22 ERRORS

While every effort has been made to ensure that the content of this EIAR document is error free and consistent there may be instances in this document where typographical errors and/or minor inconsistencies do occur. These typographical errors and/or minor inconsistencies are unlikely to have any material impact on the overall findings and assessment contained in this EIAR.

⁵ Guidelines on the Information to be contained in Environmental Impact Assessment Reports, Environmental Protection Agency, 2022

⁶ Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems - Key Issues Consultation Paper, Department of Environment, Community and Local Government, 2017.

2.0 DESCRIPTION OF THE PROJECT AND ALTERNATIVES

2.1 INTRODUCTION AND TERMS OF REFERENCE

This section of the EIAR has been prepared by John Spain Associates, Planning & Development Consultants, and provides a description of the proposed development and also explains the evolution of the scheme design through the reasonable alternatives examined. This chapter of the EIAR was prepared by Rory Kunz, BA (MOD), MScERM, MAT&CP, Dip EIA Mgmt., Executive Director with John Spain Associates, and approved by John Spain, Managing Director.

Rory Kunz has a Masters in Environmental Resource Management and a Diploma in EIA Management (both from UCD) as well as a Masters in Town and Country Planning. In addition, Rory is a corporate member of the of the Irish Planning Institute and has over 20 years of experience of Environmental Impact Assessment and urban development.

Rory has acted as lead planning consultant on a range of high-quality complex planning applications across the country over an extended period. Rory has wide-ranging experience in the management and review of Environmental Impact Assessment Reports (EIAR) for major residential and mixed-use development and redevelopment projects. Inputs to this chapter have also been provided by Doran Cray Architects, Paul McGrail Consulting Engineers, Simon Ronan Landscape Architects, Transport Insights, and ENX Consulting.

The description of the proposed development is one of the two foundations upon which an EIAR is based (the other being the description of the existing environment described in this chapter and by each of the specialist consultants in the subsequent chapters). It is also a requirement of the EIA Directive (as amended) to present *“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.”*

2.2 DESCRIPTION OF THE LOCATION OF THE PROJECT

The location of the project is within the administrative area of Fingal County Council. The lands are situated within the development boundary of Balbriggan as identified in the Fingal County Council County Development Plan 2023-2029. The proposed development site is situated in the within the townlands of ‘Clonard or Folkstown Great’, ‘Clogheder’, Balbriggan, Co. Dublin relating to an overall site area of 7.15 hectares.

2.2.1 TOPOGRAPHY

The site slopes from North West 52.15 OD to 34.35 to South East and the gradient varies in the boundary line around 1:20 to 1:50 slope.

A site investigation (S.I) was carried out by Grounds Investigations Ireland Ltd. (GII) in March 2024 (contained in Appendix C Volume III of the EIAR). Topsoil was encountered in all the exploratory holes and was present to a maximum depth of 0.3m BGL and is described / identified as Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets. Tarmac surfacing was present typically to a depth of 0.05m BGL.

Soft brown slightly sandy (sand component fine to medium), slightly gravelly (gravel component subangular fine to coarse grade limestone) CLAY with occasional / low cobble content and frequent rootlets. MADE GROUND deposits were encountered from ground level at the location of BH01, BH01A and SA01 to a maximum depth of 0.60m BGL. These deposits were described generally as a *Grey slightly clayey sandy fine to coarse angular to sub angular Gravel or grey coarse angular cobbles.*

A site investigation (S.I) was undertaken between February and April 2020 to assess the lands which the Phase 3 of this Residential Development. This report is contained in Appendix C Volume III of this EIA.

Of the subject exploratory holes produced, BH01, BH04, TP-08, and RC04 are located at / within the development boundary for this Balbriggan Phase 4 of the residential development, while BH03 is located directly adjacent to the phase 4 redline boundary. The remainder of the exploratory points occupy the proximal lands in adjacent fields.

Discrete quantities of sandy gravelly reworked Clay were encountered in trial pits TP01, TP02, TP04, TP04A, TP05 and TP06, all of which are either within or in close proximity the phase for boundary associated with this EIAR.

Figure 2.1: Topography of Project Site

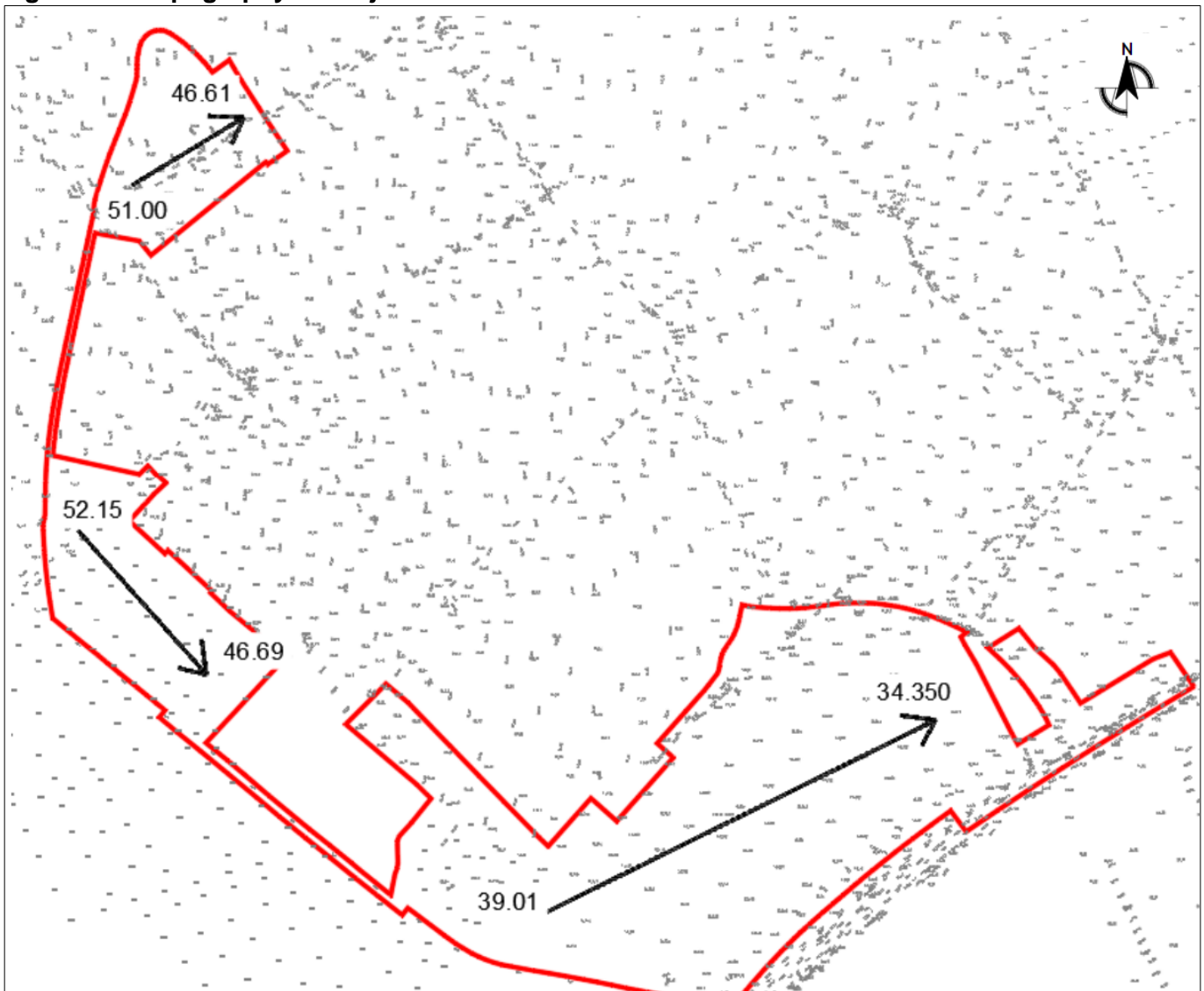
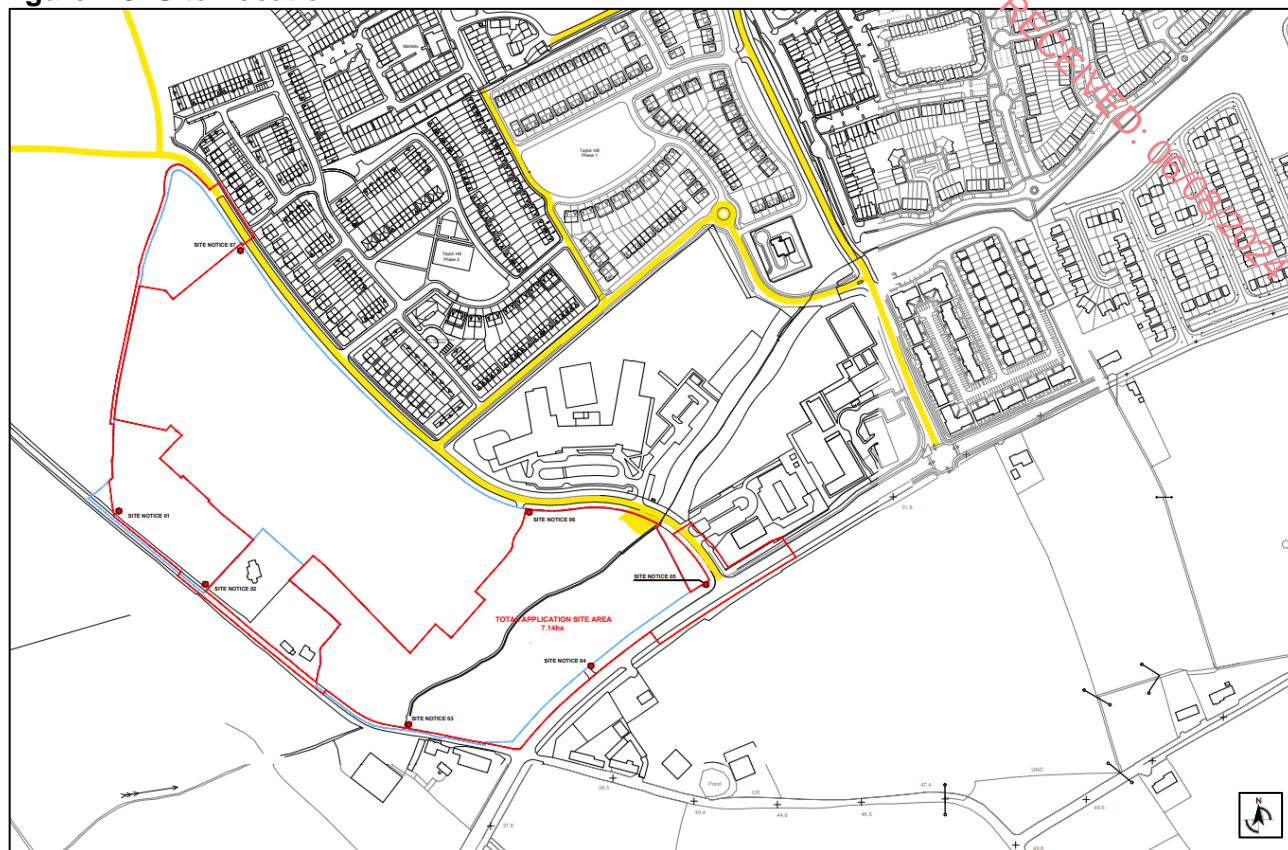


Figure 2.2: Subject Lands – Location of Project

Source: P McGrail Consulting Engineers

The development site is located approximately 1.5 km east of the Balbriggan district town centre. The Masterplan Phase 4 “Ladywell/Folkstown” site is bound on the south by Clonard Road (regional Route R122), on the east by under construction Phase 3, Boulevard Road and the committed Taylors Hill residential developments (Phase 1 and 2) and on the north by the future development. The subject development is bounded by Bridgefoot Road to the south and west, and Boulevard Road to the southeast and east (respectively) and further east by Taylor Hill Grange Residential Estate. Agricultural land bounds the site to the west and northwest.

Figure 2.3: Site Location

Source: DCA

2.3 DESCRIPTION OF THE PHYSICAL CHARACTERISTICS OF THE WHOLE PROPOSED DEVELOPMENT

2.3.1 MAIN CHARACTERISTICS OF THE OPERATIONAL PHASE OF THE PROJECT

In summary, the proposed development comprises

Table 2.1: Summary of Key Site Statistics

Key Site Statistic	Detail
Site Area	7.15 hectares (gross); 5.26 hectares (net)
Land Use Zoning	RA – Residential Area Objective: Provide for new residential communities subject to the provision of the necessary social and physical infrastructure
No. of Dwellings	197 no. dwellings consisting of 129 no. houses, 18 no. townhouses, 16 no. duplex dwellings, 4 no. apartments, 12 no. maisonette apartments and 18 no. later living dwellings all on a of c. 7.15 hectares
Commercial Floorspace	1 no. retail/café unit (c. 165 sq. m) and 1 no. retail/medical unit (c. 185 sq. m)
Open Space	Public Open Space 0.85 hectares, Riparian Corridor Open space 0.76 hectares.
Density	37.4 dph (net)
Building Heights	2 and 3-storeys
Dual Aspect	100%
Car Parking	280 spaces

Key Site Statistic	Detail
Bicycle Parking	Secure Private spaces 196* (40 visitor)
Vehicular Access	Boulevard Road to the east
Floorspace	17,538 sq. m

*all in-curtilage parking provided with EV charging only units without access to secure rear gardens are provided with secure bike & bin receptacles (apartments, duplexes & terraced units)

2.4 DESCRIPTION PROPOSED DEVELOPMENT

The development will consist of the construction of 197 no. dwellings, open space, and ancillary infrastructure will facilitate Phase 4 of the lands at Folkstown in Balbriggan as follows:

- A) 129 no. terraced and semi-detached houses comprising 55 no. 2-bedroom houses (2 storey), 67 no. 3-bedroom houses (2 storey) and 7 no. 4-bedroom houses (3 storey) [house types with variants];
- B) 18 no. terraced and semi-detached 3 bedroom townhouse dwellings; 18 no. Later Living Units (8 no. 1 bedroom & 10 no. 2 bedroom – all bungalows) [house types with variants];
- C) 12 no. 1 bedroom Maisonettes in 6 no. 2-storey semi-detached buildings, and 4 no. 1 bedroom apartments in a 3-storey building (all apartments with terraces) along with 1 no. retail/café unit (c.165 sq. m) and 1 no. retail/medical unit (c. 185 sq. m) [including 'back of house area' & both units to be able to be sub-divided and amalgamated];
- D) 16 no. duplex apartments (comprising 8 no. 1 bedroom [with terrace] and 8 no. 3 bedroom units) in 4 no. 3 storey buildings;
- E) Public open space c.0.85 hectares (with an additional c.0.76 hectares of riparian corridor open space), hard and soft landscaping (including public lighting & boundary treatment) and communal/semi-private open space (c. 660 sq. m) for the proposed townhouse, duplex and apartment units;
- F) Vehicular access will be provided via the Boulevard Road along with the provision of car parking spaces (280 no.), bicycle parking spaces and all internal roads and footpaths and bicycle and bin stores;
- G) Provision of surface water attenuation measures, (including widening of Clonard Brook), connection to water supply, provision of foul drainage infrastructure to Irish Water specifications and all ancillary site development, construction, and landscaping works [and temporary construction access from local road L1130];
- H) The proposal will also amend the layout to elements of the shared layout across the permitted phases to include (Phase 3A [F21A/0055;ABP Ref:312048-21] relating to 29 no. dwellings replaced with 26 no. dwellings, Phase 3B [F22A/0526] relating to layout and Phase 3C [F22A.0670] relating to 3 no. dwellings replaced with 4 no. dwellings and associated amendments to attenuation (Clonard stream) and services.
- I) Provision of signalised upgrade of the junction of Boulevard Road and the Clonard Road (R122).

2.5 DEMOLITION

There is no demolition of habitable or any other structures relating to the proposed development.

Figure 2.4: Site Layout

Source: DCA

The Site Layout Plan shows the main development site.

2.6 RESIDENTIAL DEVELOPMENT

The proposed development will provide for 197 no. houses and duplex/apartment units. The overall mix of units within the scheme is noted as follows:

Table 2.2: Overall Mix of Units

	1-bed	2-bed	3-bed	4-bed	Overall
Houses		55	67	7	129
Townhouses			18		18
Duplex Apartments	8		8		16
Maisonettes	12				12
Apartments		4			4
Later Living Dwellings	8	10			18
	28	69	93	7	197
Mix Overall Phase 4 %	14.2%	35.0%	47.2%	3.6%	

The proposal will include significant areas of open space and landscaping in accordance with the objectives of the Fingal County Development Plan 2023-2029. These will include a combination of pocket parks, neighbourhood park and interlinked shared surfaces which will enhance pedestrian movement and permeability.

2.6.1 HOUSES

The 129 no. houses are designed as two and three-storey family dwellings, in a wide mix of units comprising 55 no. 2-bedroom houses, 67 no. 3 bedroom houses and 7 no. 4 bedroom houses, in terraced and semi-detached. Individual plot layouts provide good separation to ensure privacy and minimise overlooking. The end-row and end terrace house types have been used to turn corners, with front doors and windows giving activity and passive supervision to the sides and avoiding large blank gables. All houses are 2 no. storeys (with the exception of the 4 bed dwellings) and include private amenity space in the form of a rear garden. Individual plot layouts provide good separation to ensure privacy and minimise overlooking to the adjoining residences along the Clonard Road and also to the permitted Phase 3 dwellings to the east.

The variety of house types provides for a wide choice to suit all potential occupiers and many household types, as well as permitting a very efficient site layout. The mix of house type in the street frontage creates visual interest and contributes to the specific character of the development, both overall and in each street. The overall provision of 7 no. house types adds positively to the variety for potential occupiers and contributes to a development which provides high quality family homes in a legible and efficient layout which is easily navigable.

Figure 2.5: CGI South Western Portion of Subject Lands

Source: DCA

2.7 TOWNHOUSES

It is proposed to provide 18 no. 3 bedroom townhouse dwellings (House Types G1, G2, G3), in 3 no. locations along the external frontage of the subject site, with 2 locations on the Boulevard Road, and the 3rd location to front onto the western side of the site.

Figure 2.6: CGI Three Storey Townhouses fronting onto Western Boundary

The 3-bedroom Townhouse types are generous in size comprising 122.7 sq. m (compared to a requirement of 110 sq. m). The DCA document A507-DCA-XX-XX-DR-A-303 provides a full Housing Quality Assessment of the units. In all metrics the townhouses exceed the internal requirements of the Fingal County Development Plan.

With regard to private open space the dwellings are in compliance with the provisions of SPPR2 the Compact Settlement Guidelines which allows for a minimum of 40 sq. m of private open space for 3 bedroom dwellings and a *“further reduction below the minimum standard may be considered acceptable where an equivalent amount of high quality semi-private open space is provided in lieu of the private open space, subject to at least 50 percent of the area being provided as private open space.”*

The townhouses include a range of private open space areas of between 23-27 sq. m, with the remainder provided in high quality communal open space areas.

Figure 2.7: CGI Townhouses



2.8 DUPLEX UNITS

It is proposed to provide 16 no. duplex apartments (Duplex Types J, K, JM, KM comprising 8 no. 1 bedroom and 8 no. 2 bedroom units) in 4 no. 3 storey buildings which are located along the Clonard Road to create a stronger frontage onto the Clonard Road to the east and west. Three-storey duplex units act as bookends along the streetscape. Parking for the two-storey units fronting onto the Clonard Road is located to the rear which helps provide an attractive and uncluttered streetscape.

Figure 2.8: 3 Storey Duplex Buildings Southwestern Corner of Subject Lands

The layouts and private open space of the units are in accordance with the provisions of the Apartment Guidelines 2023.

2.9 LATER LIVING UNITS

Located within the southern part of the subject site it is proposed to provide 18 no. Later Living Units (8 no. 1 bedroom & 10 no. 2 bedroom – all bungalows);

Figure 2.9: Location of Later Living Accommodation.

The design of the Later Living Units means that all sides provide an active frontage which improves passive surveillance along the riparian corridor and onto areas of Open Space. The single-storey nature of the

units allows them to sit comfortably within the existing hedgerows which flank the dwellings to the north and south and provide residents with an attractive amenity on their doorstep.

All will be accessed via a Part M compliant stair which have been designed in accordance with the Universal Design Guidelines for Homes in Ireland.

In addition to the later living units the development includes 6no. ground floor 1-bed maisonettes which equates to 12% of the units on site which is in compliance with Objective DMSSO37 of the FCC Development Plan which requires the provision of 10% of a development over 100 units to be age friendly accommodation.

Overall, the development provides 38no. universally accessible units which equates to 19% of the total units proposed.

Figure 2.10: CGI Later Living Accommodation



Source: DCA

2.10 MAISONNETTES

It is proposed to provide 12 no. 1 bedroom Maisonettes [Apartment Types P1, P2, P3, & P4] in 6 no. 2-storey semi-detached buildings interspersed throughout the site. 4 no. are located in the northern cell and 2 no. located in the south western portion of the subject site.

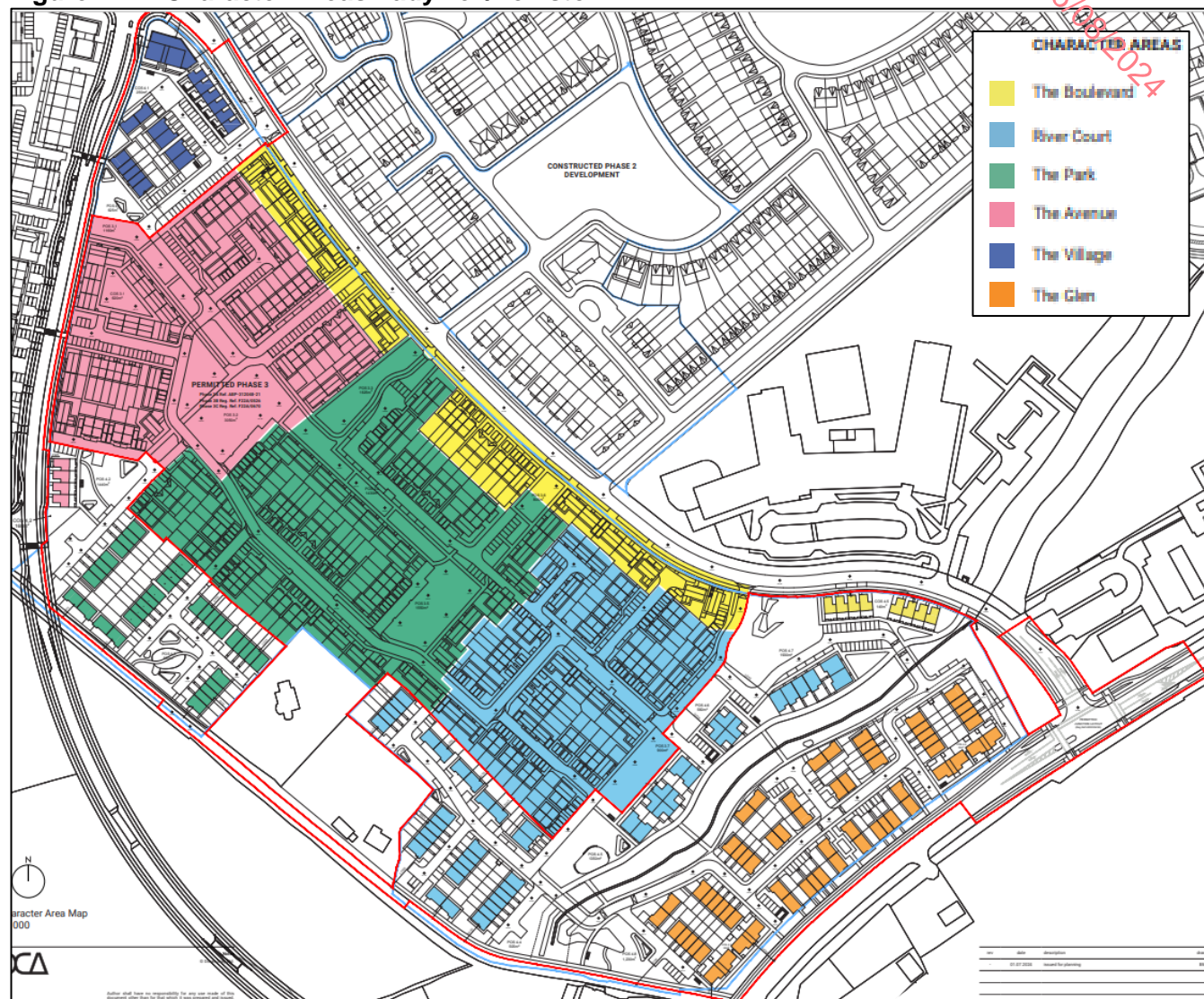
Generous areas of private open space are provided to the rear for each unit as indicated in the images opposite. Ground floor units are afforded direct access to their areas of private open space to the rear. First floor units are provided with a detached area of open space to the rear for the purpose of providing a secure area for bins, bikes and a garden shed for ancillary storage.

The upper floor unit provides the living room to the front of the building, which avoids the main living area overlooking the private open space of the ground floor unit to the rear. Only the bedroom will overlook the ground floor amenity space which is no different to the typical and accepted arrangement that exist within all residential schemes.

2.11 CHARACTER AREAS

The scheme layout is designed to integrate into the adjoining character areas of the permitted Phase 3 development at Ladywell.

Figure 2.11: Character Areas Ladywell/Folkstown



Source: DCA Drawing no. A507-DCA-XX-XX-DR-A-024

As set out in the Doran Cray Architectural Design Statement, careful consideration has been given to the materiality of the buildings to create distinctive character areas and good quality open spaces, thereby encouraging social interaction. Density and scale, open space landscaping and building material choice all contribute to creating distinct character areas.

The masterplan is divided in six main character areas, five of which have already been permitted within the previous Phase 3 applications. While the design of the units proposed differs from those already permitted, their inclusion as part of 'The Avenue', 'The Boulevard', 'The Park' and 'The River Court' character areas will continue the materiality language of the permitted scheme to help create a unified appearance across the entire development.

A new character area is proposed along Clonard Road to the south, 'the Glen'.

The design of the proposed units provide flexibility to vary the materiality to respond to the character area they are located adjacent to, as is illustrated below. The range of materials proposed in the permitted

Ladywell development will enable the design to accommodate different architectural expression while maintaining visual coherence with the permitted scheme. This ensures that the proposed units not only enhance the overall visual appeal of the development but also contribute to a sense of continuity and harmony within the community.

2.11.1 NORTHERN PART OF SUBJECT SITE – THE VILLAGE

The northern part of the subject site includes The Village and is to be accessed from the Boulevard Road located to the east and comprises 4 no. 1 bedroom apartments (Type A1) in a 3-storey building (all apartments with private open space) along with 1 no. retail/café unit (c.165 sq. m) and 1 no. retail/medical unit (c. 185 sq. m) [including 'back of house area' & both units to be able to be sub-divided and amalgamated].

In addition, it is proposed to provide 6 no. 3 storey townhouses fronting onto the Boulevard Road all to provide a strong urban edge – these units are dual fronted so that the rear area is also overlooked. To the rear it is proposed to provide 8 no. Maisonettes dwellings in 4 no. 2 storey semi-detached buildings and 7 no. terraced/semi-detached dwellings.

Figure 2.12: Northern 'Village' Area



Source: DCA

Within the northern part of the layout, it is proposed to provide a public open space area of some 625 sq. m which includes natural play areas and is overlooked by dwellings to the east and to the west (as part of the permitted Phase 3C).

In addition, it is proposed to provide a communal open space area of c. 250 sq. m which will augment the private open space serving the townhouses (in accordance with the Compact Settlement Guidelines 2024).

Figure 2.13: CGI Northern Frontage of Local Centre



Source: DCA

2.11.2 WESTERN PART OF SUBJECT SITE - 'THE AVENUE' AND 'THE PARK' CHARACTER AREAS

The Western portion of the subject lands includes dwellings located in 'The Avenue' and 'The Park' Character areas.

The area includes 4 no. 3 storey 3-bedroom townhouse dwellings (which are to replace the 3 no. previously permitted courtyard dwellings).

The remainder of the northern parcel of land includes a series of 36 no. 2 storey houses. Vehicular access will be from the permitted road layout of the adjoining Phase 3 Ladywell development (under Phases 3A-3C).

The dwellings located at the end of the row of houses front onto the local road providing passive surveillance but are accessed from the east (vehicular).

In addition, it is proposed to provide open space in 2 main locations, c.0.14 hectares in the northern part of the cell, and an open space area of c.0.08 hectares in the southern part of the cell. Both of the open space areas are fronted onto by dwellings providing appropriate passive surveillance.

Figure 2.14: Western Portion of Subject Lands

Source: DCA

2.11.3 SOUTH WESTERN PART OF SUBJECT SITE – RIVER COURT CHARACTER AREA

Located to the south of the existing dwellings on the Clonard Road, is a new area of dwellings which will link into the proposed entrance to the south as well as to the permitted layout under Phases 3A-3C.

Overall, it is proposed to provide 31 no. houses along with 4 no. 1 bedroom Maisonette dwellings.

Figure 2.15: South western parcel



Source: DCA

This area includes open space areas located immediately to the south which are fronted onto by dwellings providing passive surveillance.

2.11.4 LANDS TO THE NORTH AND SOUTH OF THE CLONDARD BROOK – CHARACTER AREAS ‘RIVER COURT’, THE BOULEVARD, & THE GLEN.

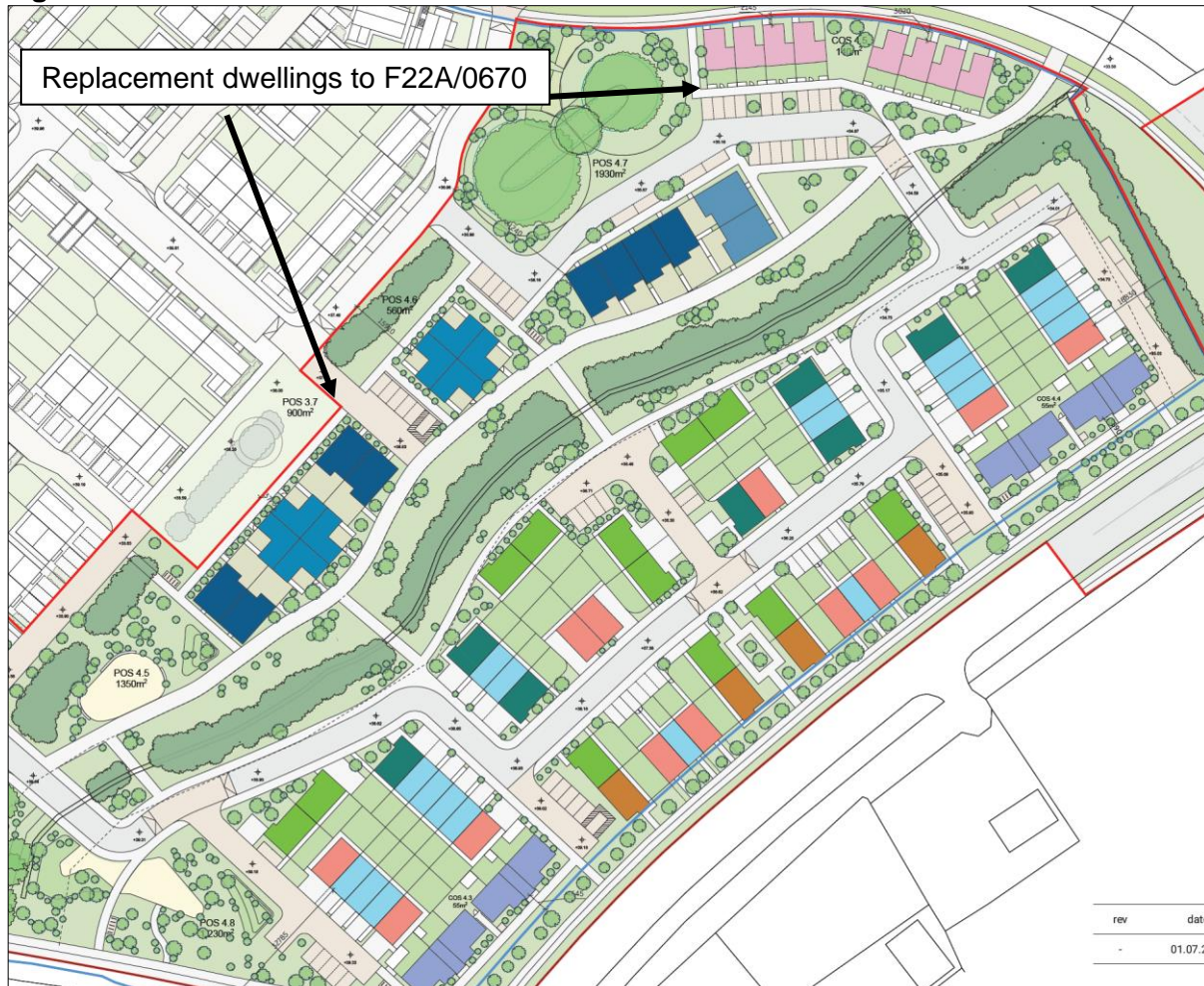
Located to the north of the Clondard Brook – there are 2 no. Character Areas ‘River Court’ & The Boulevard, which link into the permitted River Court area to the north. This area includes 18 no. Later Living Units (8 no. 1 bedroom & 10 no. 2 bedroom – all bungalows) as well as 8 no. 3 storey duplex townhouses located along the Boulevard Road.

The remainder of the subject site comprises 2 elements consisting of amendments to the permitted Phase 3A [F21A/0055; ABP Ref:312048-21] relating to 29 no. dwellings replaced with 26 no. dwellings which are located to the north of the riparian corridor.

It is proposed to retain the trees (as per the previous permission) located at the entrance from the Boulevard.

In addition, to the south of the riparian corridor, it is proposed to provide a new character area ‘The Glen’ comprising a mixture of 58 2 and 3 storey no. houses and 16 no. duplex apartments (Duplex Types J, K, JM, KM comprising 8 no. 1 bedroom and 8 no. 2 bedroom units) in 4 no. 3 storey buildings.

Figure 2.16: Southern Parcel



Source: DCA

Figure 2.17: Internal CGI View of Townhouses

Source: DCA

Figure 2.18: CGI View towards Later Living Units

Source: DCA

Figure 2.19: CGI View towards Later Living Units

Source: DCA

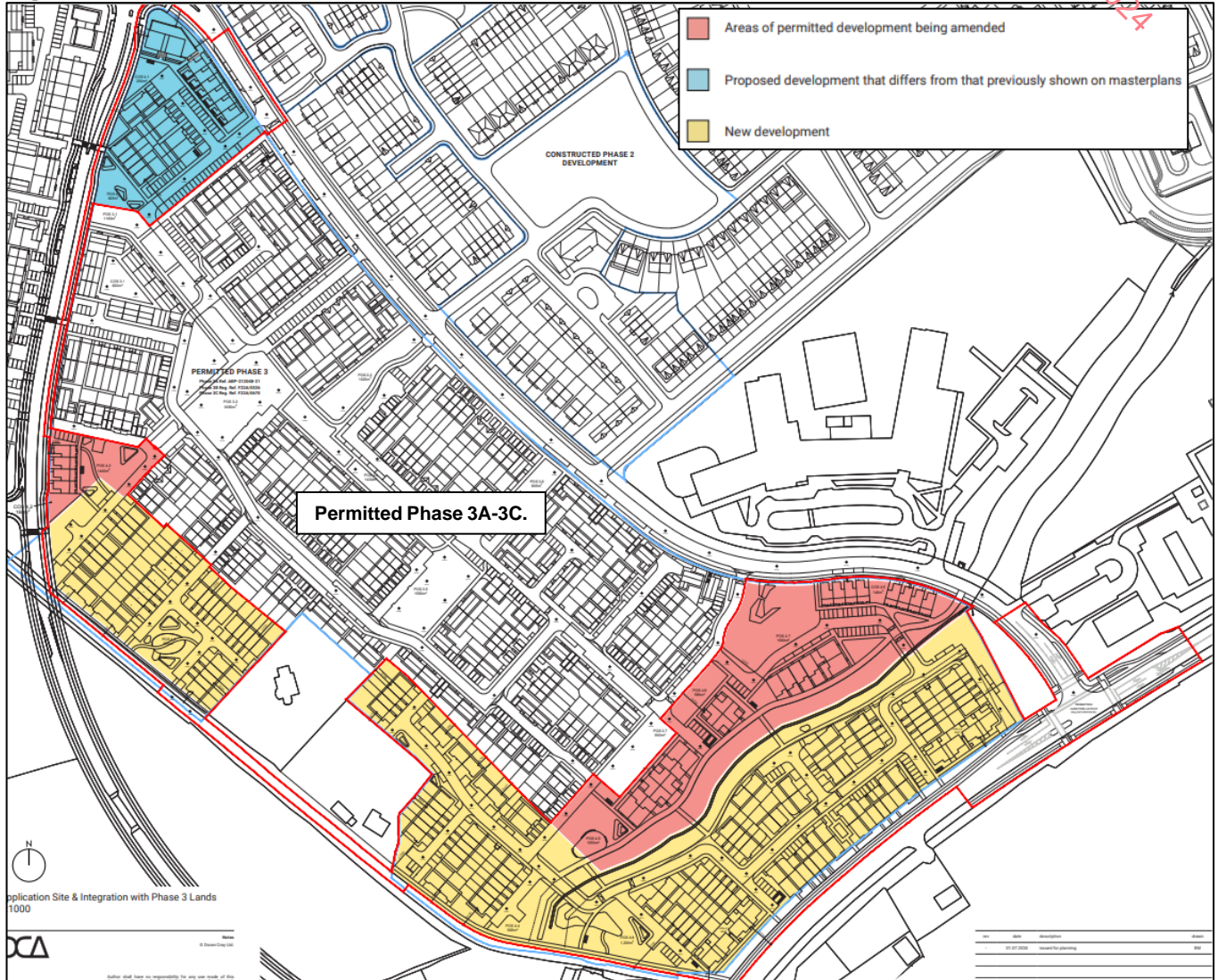
Figure 2.20: Internal CGI View 'The Glen'

Source: DCA

2.12 INTEGRATION AND PROPOSED AMENDMENT TO PHASE 3

The application proposes to amend areas permitted previously in Phase 3A and 3C (areas shaded red in the drawing below). The area shaded blue represents proposed development that differs from that previously shown in masterplans submitted in applications for Phase 3A, 3B and 3C. Areas shaded yellow represents proposed development on lands to be acquired by the applicant.

Figure 2.21: Phase 3 Amended Areas



Source: Doran Cray Drawing no. A507-DCA-XX-XX-DR-A-010

When completed, Phase 4 will result in an increase in the total number of residential units across the Ladywell site from 306 no. (as per the Phase 3 Masterplan altered in accordance with the Phase 3B and 3C applications [FCC Reg. Refs. F22A/0526 and F22A/0670]) to 434 no. units (an increase by 128 no. units or 42%). The overall design approach in respect of landscaping, drainage, and SUDs is fully consistent with that applied for the preceding Phase 3B and 3C applications.

2.13 LANDSCAPING STRATEGY

As set out in the Simon Ronan Landscape Architects (SRLA) report, this project embraces sustainable practices such as habitat restoration and the implementation of water management strategies, fostering a thriving ecosystem that supports a wide array of plant and animal species, ensuring a balanced and resilient environment for future generations.

The proposed development will provide 0.85 hectares of open space for Phase 4 which is c. 16.1% of the net site area (as per Sustainable Compact Guidelines 2024) or 14% of the site area of 6.03 hectares (excluding road junction upgrade). It is noted that there is a substantial area of amenity space in the form of the riparian corridor (0.76 hectares) which has been excluded from the calculations, but which could be included in the overall total (in part – excluding water channel), due to the additional amenity afforded by that particular space. The open space provision is considered appropriate and within the range of the Fingal CDP which requires between 12%-15% of the site area.

Figure 2.22: Landscape Masterplan North



Source: SRLA

Within the northern part of the layout, it is proposed to provide a public open space area of some 625 sq. m which includes natural play areas and is overlooked by dwellings to the east and to the west (as part of the permitted Phase 3C).

In addition, it is proposed to provide a communal open space area of c. 250 sq. m which will augment the private open space serving the townhouses (in accordance with the Compact Settlement Guidelines 2024).

Noting the commercial function of the northern building, there is a hard landscaped area located to the north and west which will provide an attractive feature and demarcate the local centre as a place to visit.

Figure 2.23: Landscape Masterplan Central



Source: SRLA

Figure 2.24: Landscape Masterplan South

Source: SRLA

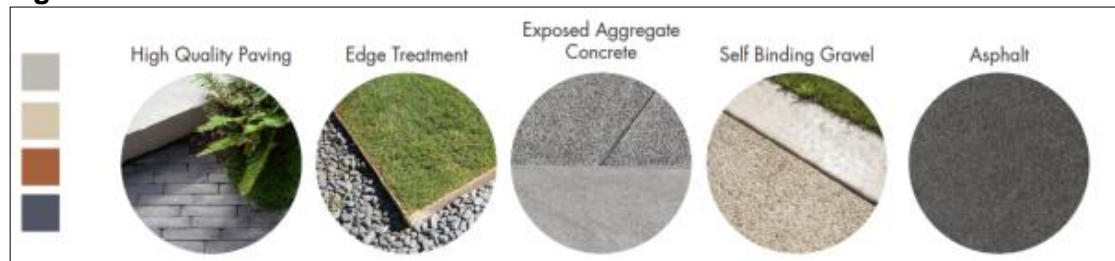
2.13.1 HARD LANDSCAPING

Landscape Plans and schedules included in the application, prepared by SRLA Landscape Architects includes a detailed schedule of proposed materials and levels, including delineation of paving, kerbs, benches, bollards, and all hard landscape elements proposed.

The selection of hard landscape materials is determined by function but also to provide a cohesive palette of materials throughout. Materials are chosen for durability, but where practical are proposed to be constructed in a way which is sensitively integrated with lawn and soft landscape, in order to minimise the impact of hard landscape surfaces. Primary vehicular, pedestrian and cycle circulation are proposed as a durable, limited range of neutral materials with robust construction.

Typically, roads in bituminous macadam and all other roads in a selected coloured or High Friction asphalt. Self-binding gravel and high-quality paving are proposed for pedestrian routes in open spaces.

The hard materials palettes have been selected to represent and respond to use and character of specific spaces. They will be durable and of high quality with patterning developed in the latter stages to indicate moments and celebrate thresholds.

Figure 2.25: Surface Finishes

Source: SRLA

Figure 2.26: Boundary Treatment

Source: SRLA

The boundaries between the site, both external and internal, will be of high quality and provide a degree of visual transparency.

Figure 2.27: Furniture

Source: SRLA

Bins, bollards and seating have been selected as appropriate to the design language and surroundings within which they fit. These for the most part will be off the shelf products and specified accordingly.

2.13.2 SOFT LANDSCAPING

Landscape plans and schedules included in the application, prepared by SRLA Landscape Architects includes a detailed schedule of proposed planting and illustrates the location and extent of grass, low ground cover, hedge and tree planting as well as existing trees to be retained.

Tree species are selected for longevity, suitability to local soil conditions and microclimate, biodiversity (native species) and where required suitability for proximity to residential buildings. Proposed tree sizes range from heavy standards and multi-stemmed trees to native whip and forestry transplants. New individual trees are proposed in order to improve the species mix and the proportion of native species on site.

Low planting is utilized to make and reinforce sub-spaces within the larger landscape spaces, for visual screening, defensible space, visual interest, ecological purposes and to guide or direct people's movement. The low planting is conceived as subtle layering of greens within the open spaces. The planting is layered as followed; lowest - bulb planting, ground cover planting, highest - clipped hedge planting.

Native trees are from Tree Council approved nurseries and Wildflower seed mix purchased from an authentic Irish source as follows:

- **Woodland Tree Planting**

Informed by the existing and formative tree planting and a native palette the tree planting will bleed into the site and grade out from north to south.

- **Street Trees + Small Feature Trees**

Specimen tree planting will provide year long interest and beauty - landmarks in the landscape, to celebrate and identify with.

- **Wildflower & Shrub Planting**

To enhance bio-diverse credentials wildflower planting will occupy edges and large swathes of the sites periphery along with shade tolerant understory planting.

- **Coastal Irish Planting**

Coastal planting involves selecting and cultivating resilient plant species capable of thriving in the unique environmental conditions found along coastlines, including salt spray, strong winds, and sandy soils.

2.13.2.1 Pollinator Plan

The pollinator plan 2021-2025 has greatly influenced the planting palette and soft landscape strategy. This, combined with a selection of native plant species, will define the landscape design. Planting will educate and define public paths, distinguishing them from communal or private spaces.

Meadows managed in the following way will allow bloom throughout the pollinator season. A further benefit is that bumblebees are provided with an undisturbed area for nesting. Over a number of years, the area will become more and more flower-rich with local species that are adapted to the site's conditions.

Incorporating pollinator friendly perennial plants into the local community will provide food for pollinators from spring through to autumn.

Pollinator friendly perennial plants are excellent sources of pollen and nectar. They are much more attractive to bees when planted in blocks rather than as single plants. Having a pollinator friendly perennial bed is an excellent way to provide food for pollinators across their lifecycle.

2.13.3 COMMUNAL OPEN SPACE

The quantum of space for each apartment is in accordance with the DoHPLG Planning Guidelines for Design Standards for New Apartments 2023 and the Compact Settlement Guidelines 2024 in respect of the Townhouses. Drawing no. A-009 prepared by Doran Cray, provides detail of the Communal Open Space for the overall Phase 4 lands.

Proposed Communal Open Space	m ²
COS 4.1	250
COS 4.2	160
COS 4.3	55
COS 4.4	55
COS 4.5	140
Total	660m²
	(0.07ha)

2.14 ACCESS AND ROAD LAYOUT

Due to the extent of the Ladywell site and the current proposed development being distributed between its different parts, the proposed development will include multiple access points for motorised vehicles and/or active travel.

Vehicular access points can be summarised as follows:

- 1 no. direct access off Boulevard Road; and
- 2 no. indirect accesses off Boulevard Road via Phase 3 lands.

Figure 2.28: Proposed Access Points



Source: PMcGrail CE

As detailed above, 2 no. new public road accesses will be created as part of the current proposed development. All of those accesses shall be via priority-controlled junctions. The proposed Phase 4 development road network will be fully integrated with the permitted Phase 3 roads with respect to road hierarchy and signage. As detailed above, Phase 4 shall to a significant degree rely on the public road accesses provided as part of the permitted Phase 3.

With regard to active travel permeability, the current proposed development shall be connected to footpaths and cycle tracks running along all adjacent roads, namely the R122, L1130, Boulevard Road, and the planned Balbriggan Ring Road. Filtered permeability will be applied in that the number of active travel accesses will be higher than the number of vehicular accesses. Location of individual active travel access points can be examined in the site layout drawing, which forms part of this submission package.

2.14.1 SERVICING

Refuse collection vehicles are proposed to access/ egress the site using all vehicular accesses. Refuse collection truck routes will be planned to minimise turning movements, with waste bins being taken to designated collection locations prior to the waste contractor arriving.

A swept path analysis has been carried out in order to ensure that both refuse vehicles and emergency vehicles will be capable of accessing, circulating within and egressing the site. A set of swept path analysis drawings, prepared by Paul McGrail Consulting Engineers, has been included in the application package.

2.14.2 PEDESTRIAN FACILITIES

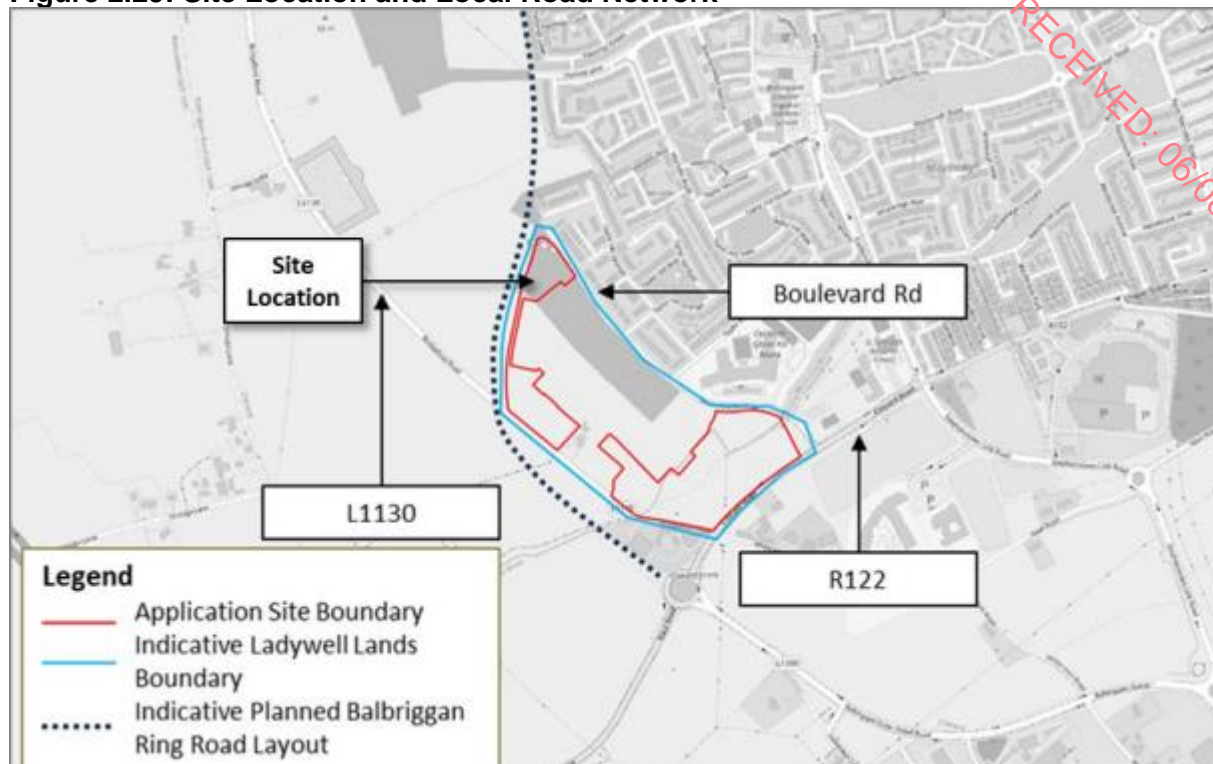
Pedestrian footpaths within the development are proposed as having a width of 2.0 metres. In addition, a 3.5 metres wide shared walking and cycling track across the southeastern part of the site, along the Clonard Stream, will be provided. The site features multiple active travel entrances from all sides to ensure high permeability.

2.14.3 CYCLING FACILITIES

As part of the proposed development, the following segregated cycling facilities will be provided:

- A one-way (southwest bound), off-street cycle track along the site's northwestern boundary (i.e. along the planned C-Ring Road);
- A one-way (southeast bound), off-street cycle track along the site's southwestern boundary (i.e. along the L1130); and
- A shared walking and cycling track across the southeastern part of the site, along the Clonard Stream.

Segregated cycle links will not be provided within the site, as this is not deemed required in the residential, traffic-calmed environment. It should be noted that the applicant does not control the lands to the north of the L1130 along the entire length of its section between the planned C-Ring Road and the R122, as two third-party dwellings are located between the applicant's land and the L1130. Due to this, it is not possible to provide a continuous cycle track along the entire road section. However, the internal road infrastructure within the site will allow a cyclist to travel between the C-Ring Road and the R122 using the traffic-calmed internal roads. The site features multiple active travel entrances from all sides to ensure high permeability.

Figure 2.29: Site Location and Local Road Network

Source: Traffic Insights

2.15 PARKING STRATEGY

The proposed cycle parking provision has been designed to encourage cycling as a key mode of transport to and from the proposed development and reduce the reliance of residents and visitors on private car use. The current (2023-2029) *Fingal Development Plan Standards*, the *Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities* (July 2023), and the *Sustainable Residential Development and Compact Settlements Guidelines* (January 2024) have been consulted in order to determine a suitable amount of cycle parking to accommodate the proposed development.

To meet the resident and visitor cycle parking demand, all apartments (4 no.), duplex units (18 no.) and terraced units are provided with secure bike and bin stores which can accommodate 2 bicycles per unit. The remaining units, which have external rear garden access (including maisonettes), are not provided with dedicated cycle parking, as bikes can be stored within their private open space.

2.15.1.1 Car Parking

The proposed car parking provision has been designed to ensure balance the resident's mobility needs with the focus on alternative modes of transport, while being cognisant of the site's locational and accessibility characteristics. The current (2023-2029) *Fingal Development Plan Standards*, the *Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities* (July 2023), and the *Sustainable Residential Development and Compact Settlements Guidelines* (January 2024) have been consulted in order to determine a suitable amount of car parking to accommodate the proposed development.

Accordingly, and bearing in mind different needs of prospective dwellers, the proposed allocation of resident parking spaces relative to dwelling size is presented below:

Table 2.3: Proposed Car Parking Space Allocation

No. Units with Given Resident Parking Space Provision		No. Resident Car Parking Spaces Assigned to the Unit			
		0.5	1	2	3
No. Bedrooms in The Unit	1	0	20	0	0
	2	18	59	0	0
	3	0	39	53	1
	4	0	4	3	0

As can be seen in the preceding table, 1 no. parking space will be assigned to each 1-bedroom and 2-bedroom unit, except for the 18 no. later living units, where 1 no. space per 2 no. units will be provided. For larger units, 1 no., 2 no., or 3 no. spaces per unit will be provided.

In addition to the above-summarised resident car parking spaces, a total of 35 no. additional parking spaces will be provided to serve the following purposes:

- 27 no. visitor parking spaces;
- 4 no. car club spaces; and
- 4 no. commercial unit parking spaces (1 per 88 no. sqm floor area).

The total car parking provision includes 280 no. spaces, which translates into 1.47 no. spaces per unit. Considering resident spaces only, a rate of 1.29 no. spaces per unit is proposed.

All of the proposed parking bays will be in the form of external surface parking spaces. Resident parking spaces will be located either in the individual unit's curtilage or, where the same is not practical, in groups of on-street spaces in proximity of the relevant units. Overall, 125 no. units will have one or two in-curtilage parking spaces, 71 no. units will have one or two assigned on-street parking spaces, while 1 no. unit will have two in-curtilage and one on-street parking spaces assigned. Most resident parking spaces will be perpendicular, except for 4 no. parallel bays in the northernmost part of the site. In addition, 17 no. visitor car parking bays (1 no. per 12 no. dwellings) will be provided, distributed across the site. Of the visitor spaces, 2 no. (ca. 10%) will be designed and marked as wheelchair accessible spaces, with appropriate buffers being provided.

To enable EV charging, 80 no. of the car parking spaces across the site (i.e. 28% of all spaces) will be equipped with chargers. The remaining spaces will be equipped with ducting to enable future installation of charging points. The proposed charging infrastructure provision is noted to exceed the Fingal Development Plan requirements (with a minimum of 20% of spaces required to have a functioning EV charging point).

A plan of car parking facilities included in Drawing A507-DCA-XX-XX-DR-A-019 in the application package.

2.16 R122/ BOULEVARD ROAD JUNCTION UPGRADE

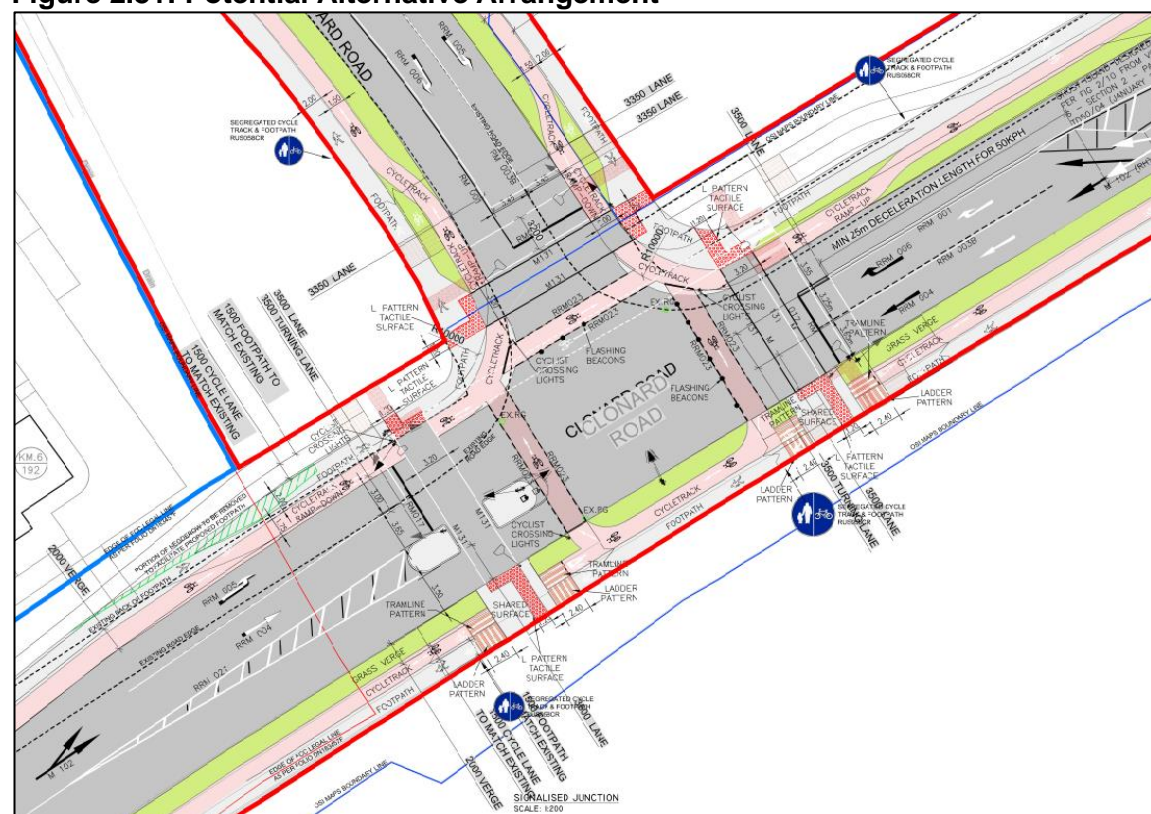
R122/ Boulevard Road Junction The R122/ Boulevard Road Junction is a 3-arm priority (stop) controlled junction located adjacent to the application site's southeastern corner, where Boulevard Road (secondary road) approaches the R122 (main road) from the north. The northern (Boulevard Road) and western (R122 West) arms have two lanes (one per direction) each, with the eastern (R122 East) arm having a single egress lane and two approach lanes: a through-lane for westbound traffic and a right-turn lane for northbound traffic. The R122/ Boulevard Road Junction shall be upgraded and provided as part of the Phase 4 development.

Figure 2.30: Boulevard Road Junction Upgrade



The proposal includes an alternative arrangement for the Boulevard Junction and the regional road (within the footprint of the red line) which is as per updated guidance in respect of cycling layout. The applicant would be happy for the inclusion of a condition, if the Planning Authority deemed this alternative arrangement to be preferable.

Figure 2.31: Potential Alternative Arrangement



2.17 SURFACE WATER AND SUDS

The surface water connection for the site will be into the Clonard Brook at the southern end of the site. The existing stream eastern of the development had been widened to form a riparian corridor as part of the permitted Phase 3A-3C developments. For continuity it is intended to be widened the existing brook at the southern end of the site to form a riparian corridor.

The drainage network for the overall Phase 4 lands was modelled and tested against different critical storms using the standard catchment rainfall profiles from the Flood Studies Report (FSR) within the Causeway Software. A critical storm is considered as a level of rainfall intensity, and the greater the year of the return period, the higher the intensity of the storm.

Based on the above, the overall site catchment is 15.74Ha with 10.48Ha of the under-construction phase 3 and 5.26Ha of the proposed development phase 4 resulting in a total greenfield runoff of 80.52/s.

The four main pillars of Suds design are water quantity, quality, amenity and biodiversity. Suds features can take many forms both above and below ground and can include planting and proprietary / manufactured products.

It is proposed to use a sustainable urban drainage system (SuDS) approach to stormwater management throughout the site where possible. The overall strategy aims to provide an effective system to mitigate the adverse effects of urban stormwater runoff on the environment by reducing runoff rates, volumes and frequency, reducing pollutant concentrations in stormwater.

The SUDs features proposed in our development are as follows:

- Modular Permeable Paving
- Swales
- Bioretention Systems
- Detention Basins
- Petrol Interceptor
- Hydrobrake flow control

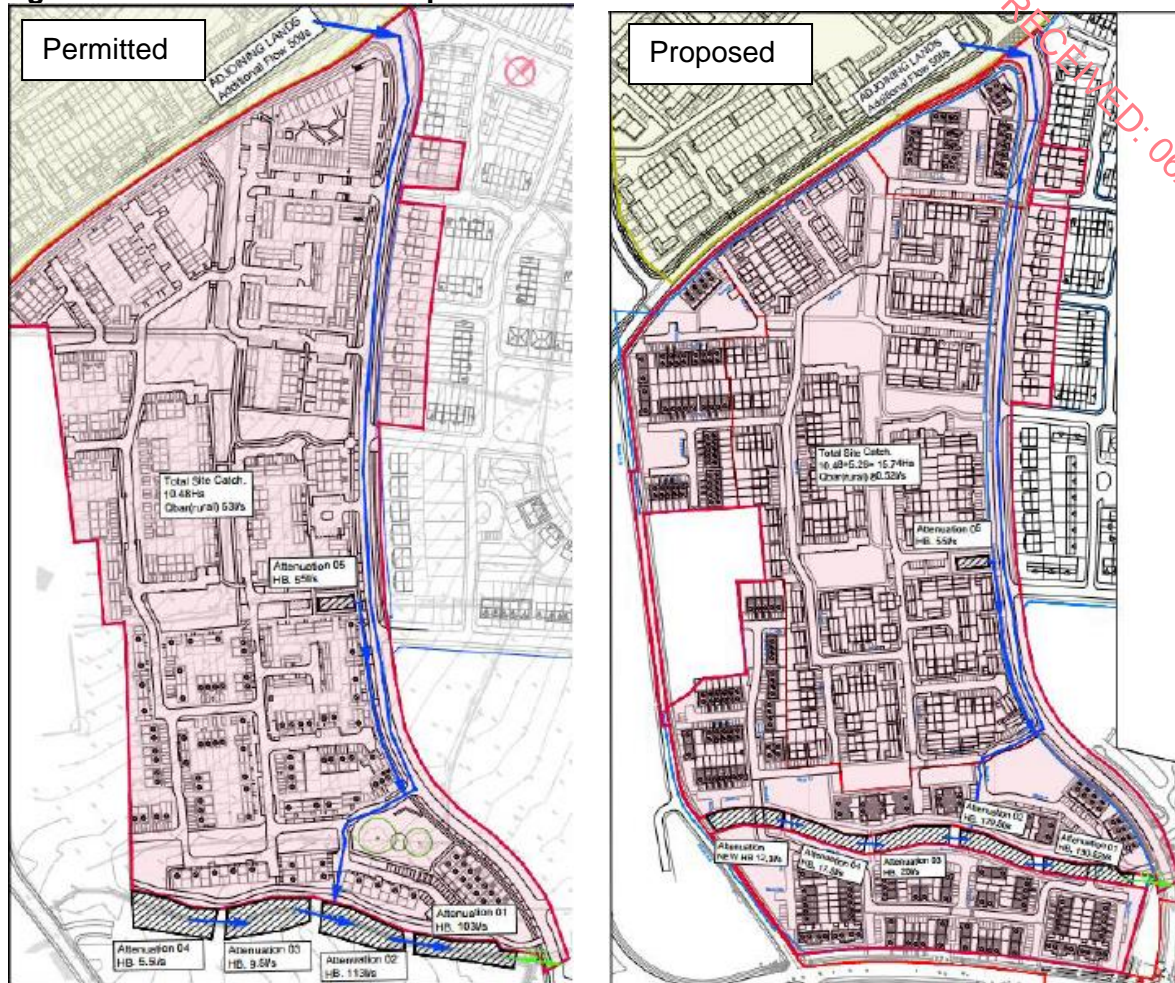
Surface water runoff from the development would be attenuated to greenfield runoff (Qbar), in accordance with the recommendations of the GDSDS. Surface water run-off from each surface water catchment will be attenuated using a Hydrobrake on the surface water outlet from each catchment.

Following discussions with Fingal County Council, it was agreed to have all the attenuations above ground and following the design strategy permitted under the 3 previous phases (3A-3C).

To protect the ground water, we have also introduced a number of petrol interceptor through the site, and this is addition to the SUDS mitigation index design

Surface water runoff exceeding the allowable outflow rate for the catchment will be stored in detention basins for rainfall events up to a 1 in 100-year return period as per Table 1 with an allowance for climate change of 20%.

The surface water management on Phase 4 follows the same methods adopted on the granted permission Phase 3 ref. F21A/0055.

Figure 2.32: Permitted and Proposed Surface Water Catchment Areas

Source: PMcGrail CE

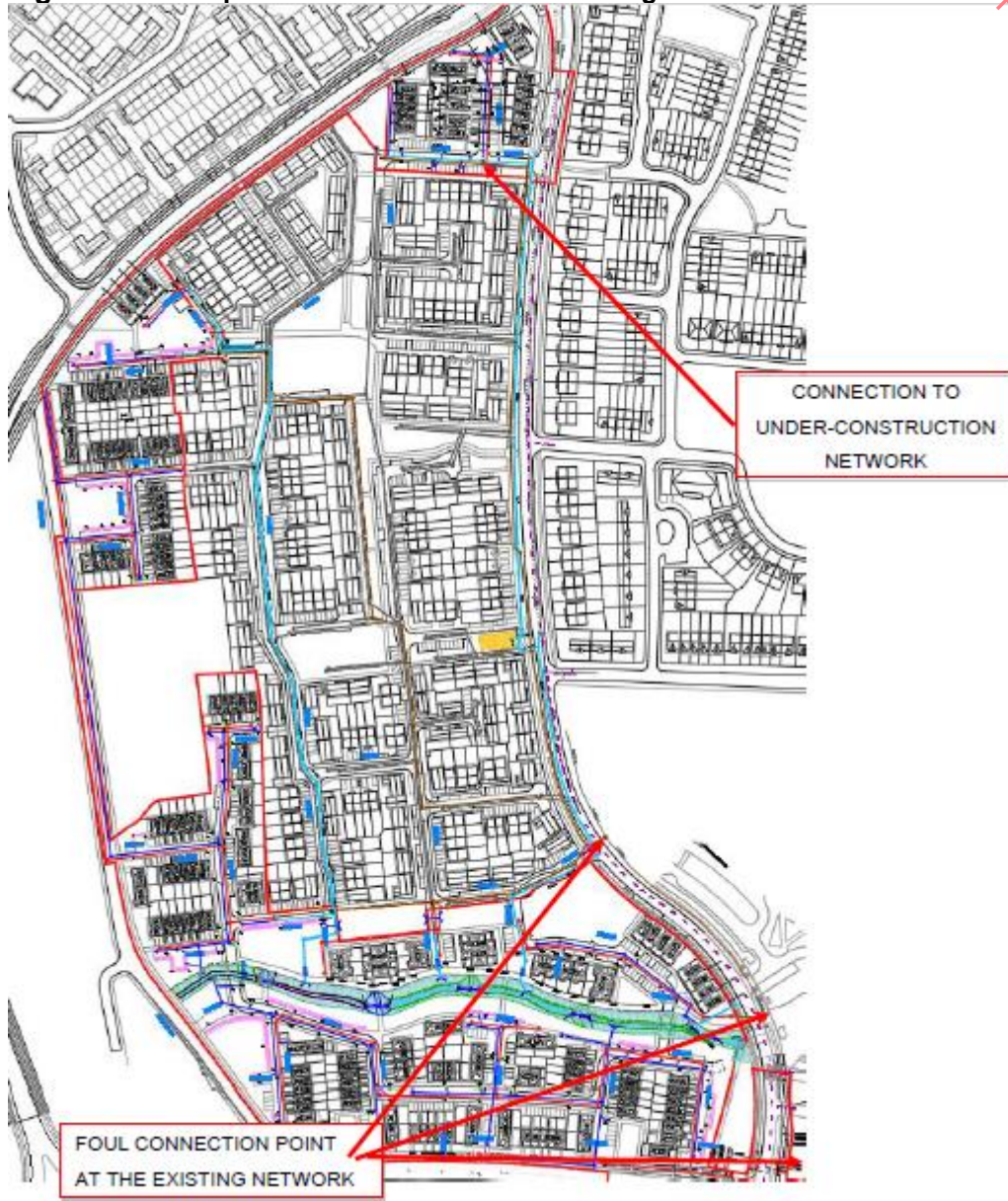
Surface water management for the proposed development is designed to comply with the Greater Dublin Strategic Drainage Study (GSDS) policies and guidelines and the requirements of Fingal County Council.

2.18 FOUL SEWER

The proposed network will connect to the existing Ø225mm Irish Water Wastewater Clonard Road Junction and Boulevard Road.

The Proposed Phase 4 Development will connect into the foul sewer arrangement permitted under the previous 3no. phases under reference F21A/0055.

The foul water drainage system for the proposed development has been designed in accordance with the Irish Water Code of Practice and will be separate to the surface water drainage system. The foul water from the development will discharge via soil vent pipes within the buildings by gravity flow before connecting into the existing separate foul sewer network within the development. The foul sewerage for each house will have a separate connection to the proposed 225mm and 150mm diameter foul sewer along the road.

Figure 2.33: Proposed Foul Connection to Existing Foul Sewer

Wastewater Discharge Calculation

- Dry Weather Flow 446 l/dwelling/day
- No. of Dwellings 197
- Post Development Average Discharge 1.017 l/sec
- Post Development Peak Discharge (6x) 6.102 l/sec
- Daily Foul Discharge Volume (446l per dwelling) 87862l

Non-Residential i.e. Retail

Wastewater Discharge Calculation

- Assumed Occupancy 20 persons
- Flow rate
- (Based on IW Code of Practice for Wastewater Infrastructure – Appendix C, Flow Rates for Design)
- 50 l/person/day
- Post Development Average Discharge (Based on 8-hour occupancy)

0.012 l/sec

- Post Development Peak Discharge (4.5x) 0.052 l/sec
- Daily Foul Discharge Volume 1000 l

A Pre-Connection Enquiry has been submitted to Uisce Eireann Confirmation of Feasibility and Statement of Design Acceptance are included in this application.

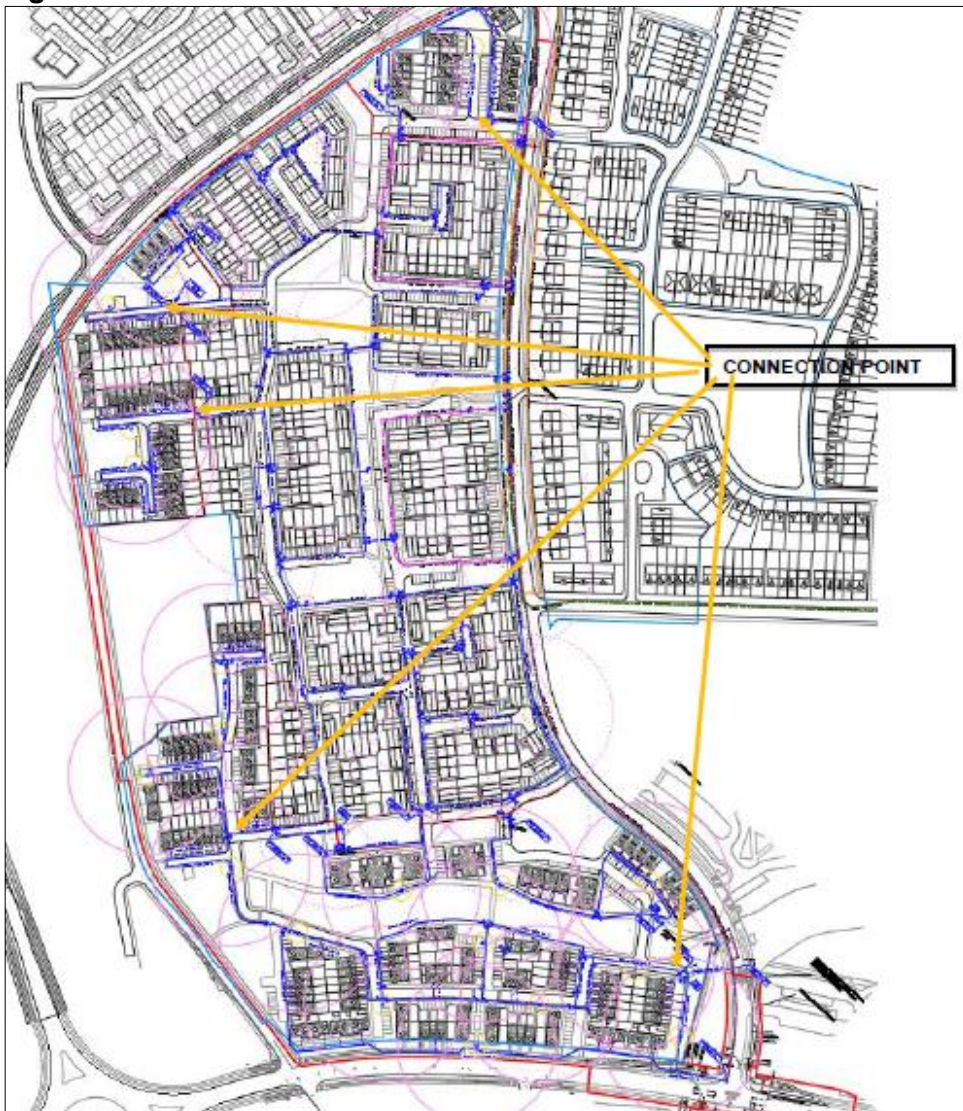
2.19 WATER SUPPLY

The connection points will be into an existing 300mm watermain pipe at Boulevard Road and under construction 100mm watermain pipes from Phase 3 granted permission ref. F21A/0055.

The proposed network has been designed to comply with Irish Water specification. Individual houses will have their own connections to the distribution main via service connections and boundary boxes. Individual service boundary boxes will be of the type to suit Irish Water and to facilitate possible future domestic meter installation.

The water main layout and details are in accordance with Irish Water Connection and Developer Services, 'Code of Practice for Water Infrastructure' and 'Water Infrastructure Standard Details'.

Figure 2.34: Water Connections

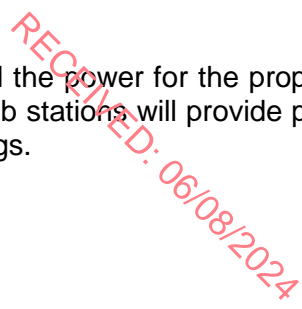


Source: PMcGrail CE

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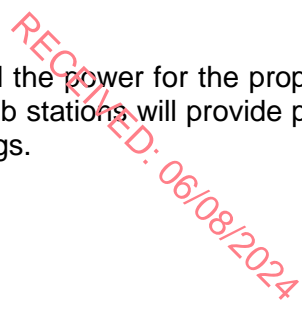
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2.20.4 WASTE

The site is a greenfield with no waste facilities. There are currently waste collectors collecting the waste from the dwellings to the East of the development and it is anticipated that during the operational phase a similar plan will be in place.

2.21 DESCRIPTION OF THE MAIN CHARACTERISTICS OF THE CONSTRUCTION PHASE

2.21.1 INTRODUCTION

The development of the lands will occur for up to 5 years having regard to the nature of the project and the need for flexibility to respond to market demand. The anticipated duration of construction within the 5 years is envisaged at between 0-48 months. A Construction Environmental Management Plan has been prepared by Paul McGrail Consulting Engineers and is included with the LRD application. The CEMP will be developed and submitted to Fingal County Council prior to commencement of development and will include the mitigation measures set out in this EIAR and to comply with any relevant conditions attached to a grant of permission.

This EIAR presents proposed mitigation measures to ensure that the planned development of the lands does not generate significant adverse impacts for residential and working communities in the vicinity of the site.

In the event that the phases were not developed (due to unforeseen circumstances) the construction period may extend, having regard to the nature of the project and the need for flexibility, contractor pricing etc. It is important to note that the mitigation measures outlined in the EIAR will ensure that an extension to the construction period will not have a negative impact on the receiving environment.

The proposed development, as described, is detailed on the planning application drawings and particulars which accompany the application.

2.21.2 CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN (CEMP)

The Contractor's CEMP will implement the measures contained in this EIAR and the CEMP (included with the application in Appendix D Volume III of this EIAR). The CEMP presents the approach and application of environmental management and mitigation for the construction phase of the proposed Project. It aims to ensure that adverse effects from the construction phase of the proposed Project, on the environment are avoided or minimised. It broadly replicates the construction stage mitigation included in Chapters 3-14 of this EIAR and as summarised in Chapter 17.

Post planning, the appointed contractor will take ownership of the Construction Environmental Management Plan (CEMP). Prior to any demolition, excavation or construction, the Construction Environmental Management Plan (CEMP) will be updated by the successful contractor. The CEMP will set out the Contractor's overall management and administration of the construction project. The CEMP will be treated as a live document and communicated to all relevant personnel on site.

The Contractor's CEMP will:

- Be maintained and the procedures implemented by the contractor for the duration of the construction period.
- Manage all polluting activities likely to occur on site and include emergency response plans for environmental incidents e.g. hydrocarbon spillages.
- Detail measures to be carried out to avoid environmental incidents,
- Detail reporting procedures to be followed if incidents occur including details of responsible person in the construction team.

- Include details of training for all site personnel in the implementation of these procedures as part of the site induction process.
- Dangerous substances, such as oils, fuels etc., will be stored in a bunded zone. Emergency contact numbers for the Local Authority Environment Section, Inland Fisheries Ireland, the Environmental Protection Agency and the National Parks and Wildlife Service will be displayed in a prominent position within the site compound. These agencies will be notified immediately in the event of a pollution incident.

In addition to the EIAR mitigation measures already included in the CEMP (and mitigation contained in this EIAR and the Openfield NIS), the Contractor will be required to include additional details under the following headings:

- Working hours and days;
- Emergency planning - in the event of a fire, chemical spillage, cement spillage, collapse of structures or failure of equipment or road traffic incident within an area of traffic management. The plan must include contact names and telephone numbers for Local Authority (all sections/departments); Ambulance; Gardaí and Fire Services;
- Details of chemical/fuel storage areas (including location and bunding to contain runoff of spillages and leakages);
- Details of construction plant storage, temporary offices and site security arrangements, measures will need to be identified in relation to security of the various sites during construction e.g. controlled access onto site, measures to secure rear gardens, access, etc;
- Truck wheel wash details (including measures to reduce and treat runoff);
- Dust management to prevent nuisance (demolition and construction);
- Site run-off management;
- Noise and vibration management to prevent nuisance (demolition and construction), Work practices, equipment noise control and screening shall be in compliance with BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise, and BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration (together referred to as B.S. 5228);
- Landscape management;

Construction of the development involves the following principal elements:

1. Site strip. Earthworks associated with the construction of the houses and roads in the development.
2. Construction of new buildings - houses, duplex units & creche.
3. Construction of roads, footpaths & hard/soft landscaping.
4. Buried site services installation. New foul pumping station. Connection to public services.
5. Works to the Cookstown Road along the site boundary, and a new footpath along the southside of the road as far as the existing school crossing.

2.21.3 CONSTRUCTION TRAFFIC MANAGEMENT PLAN

An Outline Construction Management Plan (CTMP) has been prepared by Transport Insights and is included as a section in the TTA Report. The Outline CTMP addresses likely human health risks and documents construction practices and measures that can be adopted to minimise any effects on road users.

The principal objective of the CTMP is to ensure that the impacts of all building activities generated during the construction of the proposed development upon both the public (off-site) and internal (on-site) workers environments, are fully considered and proactively managed / programmed respecting key stakeholders requirements thereby ensuring that both the public' and construction workers' safety is maintained at all times, disruptions are minimised and undertaken within a controlled hazard free environment. It is noted that the impact of the construction works will be temporary in nature.

In general, the impact of the construction period will be short-term in nature and less significant than the operational stage of the proposed development due to the reduced traffic volumes generated during the construction stage compared to the operational stage. In addition, the peak construction arrivals / departures will be outside of the road network peak hours and therefore will not exacerbate any existing delays encountered during peak times. It is anticipated that the generation of HGV's during the construction period will be evenly spread throughout the day, and such will not impact significantly during the peak traffic period.

Legislation and guidelines relevant to maintaining the safety of the public adjacent to construction works includes:

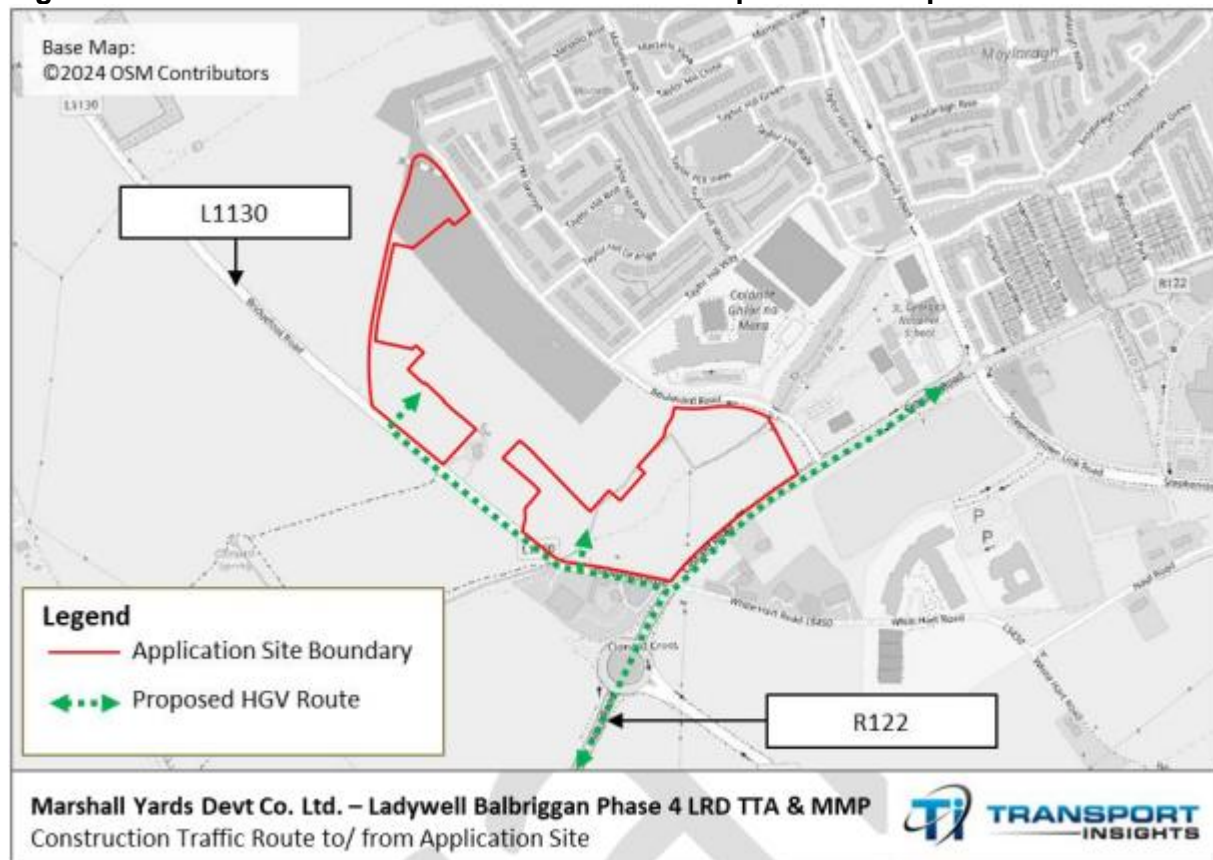
- Safety, Health & Welfare at Work (Construction) Regulations 2013
- Traffic Signs Manual Chapter 8 Temporary Traffic Measures and Sign Roadworks (2009), Department for Transport/Highways Agency
- Traffic Management Guidelines (2019), Department of Transport

Considering the above CTMP objectives, key components of its strategy are as follows:

- avoiding conflict between construction activities and traffic/ pedestrian movements;
- managing on-site deliveries; and
- staff parking arrangements and mobility management.

Avoiding Conflict Between Construction Activities and Vulnerable Road Users

Figure 2.38: Construction Traffic Routes to/from Proposed Development Site



The site access arrangements have been developed to reflect site-specific considerations emerging from the site assessment (see Section 3.1 of this Report). In addition to reflecting identified routes to/ from the site, a central consideration in determining the current access proposals is vehicular, cyclist and pedestrian safety (including construction staff).

Access to and from the development site from the surrounding road network will be via the R122, with all or most of the HGV traffic expected to travel to the site from the west, without entering Balbriggan Town (subject to contractor requirements). Construction traffic will then turn into the L1130 at the priority-controlled R122/ L1130 Junction and subsequently enter the site via one of two entrances serving the northwestern and southeastern parts of the site, respectively. Egress from the site would be via the same route. The Figure below outlines the construction traffic routes to and from the site

A signage strategy for the identified haul route from the regional road network will be developed and implemented prior to commencement of construction works.

Managing On-Site Deliveries

Vehicular access and egress to the site will be as follows:

Construction vehicles will access the site in forward gear, manoeuvre within it, and then exit in forward gear to accommodate loading or unloading activities.

A banksman will be positioned at the site accesses to manage pedestrian, cyclist, general traffic and construction traffic and the related risk to vulnerable road users.

The exact location of deliveries shall be determined at the construction phase of the development. Peak construction traffic movements are estimated to be between 30-35 no. two-way HGV trips per day and consist of a number of different truck movements relating to activities such as excavation, steel and concrete delivery, and other miscellaneous items. Regular HGV movements to and from the site are planned to only occur during the excavation and concrete pouring stages of the construction, with most of the fitout stage deliveries to be accommodated by LGVs. In order to minimise disruption to the local road network, on days where large concrete pours are ongoing, other works will be limited to cap overall traffic generation. Furthermore, during all construction phases, loading and unloading of vehicles will occur within the site compound, i.e. no such activities will take place from the adjoining public road.

Construction Staff Parking and Mobility Management

Construction Staff Parking All construction staff parking will be accommodated in temporary parking areas within the site, which will have capacity for ca. 50 no. vehicles. There will be a maximum of 150 no. staff on site at any one time (as outlined in Section 7.2), however as significant amounts of car sharing are expected as various disciplines will arrive together and also as some staff will arrive by public transport, walking and cycling, no more than 40 staff cars are expected to arrive on the site on a typical day, In addition to occasional visitor cars. As a result, no on-street construction parking and no overspill parking impacts on the adjoining local road network are envisaged for the duration of construction activities.

Construction Staff Mobility Management A maximum of 150 no. construction staff will be based on-site during peak construction activity periods. In addition, daily visitor arrivals to the site, including architects, engineers and other Client representatives are anticipated throughout the construction programme. A Construction Staff Mobility Management Plan (CSMMP) for the site will be developed by the contractor and implemented prior to construction works commencing. Key elements of the CSMMP include:

- provision of a storage compound on-site to accommodate tools and equipment, and reduce the need to travel by car or van; and
- information and promotion of available public transport services in the site's vicinity.

2.21.3.1 Outline CTMP

Following the identification of the CTMP's strategy presented in the preceding section of this Chapter, individual plan tasks are set out below and include:

Traffic Management Coordinator (TMC)

A site-based TMC shall be appointed upon award of the contract to oversee all activities relating to the CTMP's development and implementation. The TMC will assume responsibility for all traffic movements and will coordinate closely with and as a part of the construction teams on site.

Just-In-Time Deliveries

Scheduled in advance, where feasible, with direct live contact with suppliers to intervene as needed to optimise arrival times to the site.

Sourcing of Construction Materials

Within the constraints of performance, durability and cost, construction materials will, where feasible, be sourced from local suppliers and manufactures, thus, minimising the impacts of construction traffic.

Construction Traffic Timing

Arising from the construction methodology, programme and working hours, an estimated maximum of 3-4 no. HGVs per hour is envisaged during the peak construction programme period, contributing to a very small increase in background traffic on local roads. As such, delivery timing restrictions are deemed unnecessary.

Construction Working Hours

The site will operate from 07:00hrs to 19:00hrs on weekdays and from 07:00hrs to 14:00hrs on Saturday. No works will be undertaken on Sundays or Bank Holidays without the consent of FCC.

Construction Staff Mobility Management Plan

A CSMMP will be developed for the site and will apply to all construction staff (including subcontractors). The CMMP will seek to promote and inform staff in relation to non-car-based means of accessing the site. To facilitate public transport use amongst construction staff, secure on-site storage facilities for equipment and tools will be provided.

Construction Signage Plan

A signage plan will be developed and implemented, providing advance warning of the construction access junction, and likelihood of slow-moving turning traffic to/ from the site.

Sub-Contractors Obligations

Compliance with the CTMP will form part of written contracts between the principal contractor and nominated sub-contractors. The TMC will be responsible for monitoring the sub-contractor's performance in relation to all CTMP requirements, including all staff under their direct control.

Loading/ Unloading Arrangements

Methods of handling materials on site will be in accordance with construction site health and safety requirements.

Construction Vehicle Management & Cleaning

Where required, construction vehicles will be inspected prior to exit from the site to ensure that dirt is not spread onto the adjoining road, and systems shall be put in place to facilitate this process, including an on-site cleaning area and/ or rumble grid located within the site prior to the exit location.

Statutory Approvals

The principal contractor will comply at all times with FCC requirements, including but not limited to hoarding/ scaffolding licences, skip licences etc.

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Post planning, a detailed Construction Management Plan will be prepared by the selected construction contractor expanding on the preliminary plan, and the document will be submitted for approval to Fingal County Council Road prior to the commencement of any construction works. The CMP will include the mitigation contained in this EIAR including the CTMP.

The CTMP will ensure that suitable temporary traffic works, and road safety measures are put in place during the construction phase. The plan will ensure that any required traffic management measures are put in place to minimise the impact on local road users. Construction related traffic will access/egress the site via the R122 and Boulevard Road. In general, the impact of the construction period will be temporary in nature and will cease following completion of the works. No significant effects are likely to occur due to construction phase traffic.

2.21.4 LIAISON WITH NEIGHBOURING PROPERTIES

A monitoring regime will be put in place to protect neighbours & neighbouring properties with a full and detailed vibration, noise, dust, and groundwater monitoring regime put in place for the duration of the works.



The Contractor will appoint a competent person to be referred to as the Surveying, Instrumentation and Monitoring Subcontractor (MSC) who will implement the monitoring measures during the construction phase described in this EIAR.

The MSC will be responsible for preparing or organising the preparation of condition surveys of surrounding buildings, walls, hardstanding area etc. prior to the carrying out of any works on site. Extent of surveys to be agreed. The condition surveys will be carried out to a level of detail, suitable to the nature and extent of conditions encountered in order to obtain an understanding of the general structural condition of the property/structure and/or external environments. It is proposed that vibration monitoring will be conducted at properties adjacent to or within 50m of the site as required using calibrated vibration monitors and geophones capable of transmitting live text and email alerts to ensure that if vibration levels approach or exceed specified warning and limit values.

2.21.5 EXISTING GROUND CONDITIONS

The GSI/Teagasc (2024) mapping currently denotes the primary soil type underlying the site as Irish Sea Till (IrSTLPSS) which is derived from parent material described as Sandstone and shale till (Lower Palaeozoic) with matrix of Irish Sea Basin origin. These deposits are classified as AminPD - Mineral poorly drained (Mainly acidic) soils.

2.21.6 DEMOLITION

There are no demolition works required on the subject lands.

2.21.7 CONSTRUCTION COMPOUND

A construction compound will be required. See Figure below. It is intended that the primary construction compound will be located in the south western portion of the site. Smaller secondary compounds may be located within the other parcels of land to be developed to the north. The main compound will have an

approximate area of 1,500m² in size and will include stores, offices, material storage areas, plant storage and parking for site and staff vehicles.

Figure 2.39: Construction Compound



Note: Indicative to be agreed with FCC

This site is proposed to remain in place for the duration of the construction works but may be scaled up or down during particular activities on site. The construction compound will need to incorporate any protection and control measures outlined in the Construction & Environmental Management Plan, Environmental Report and comply with requirements outlined in the Construction Erosion and Sediment Control Plan (CESCP) and planning conditions. These areas will be incorporated into the development on completion of the works. Temporary buildings and containers, parking areas and material such as rubble, aggregates and un-used construction materials will be removed and disposed appropriately. The location of the construction compound may be relocated during the course of the works.

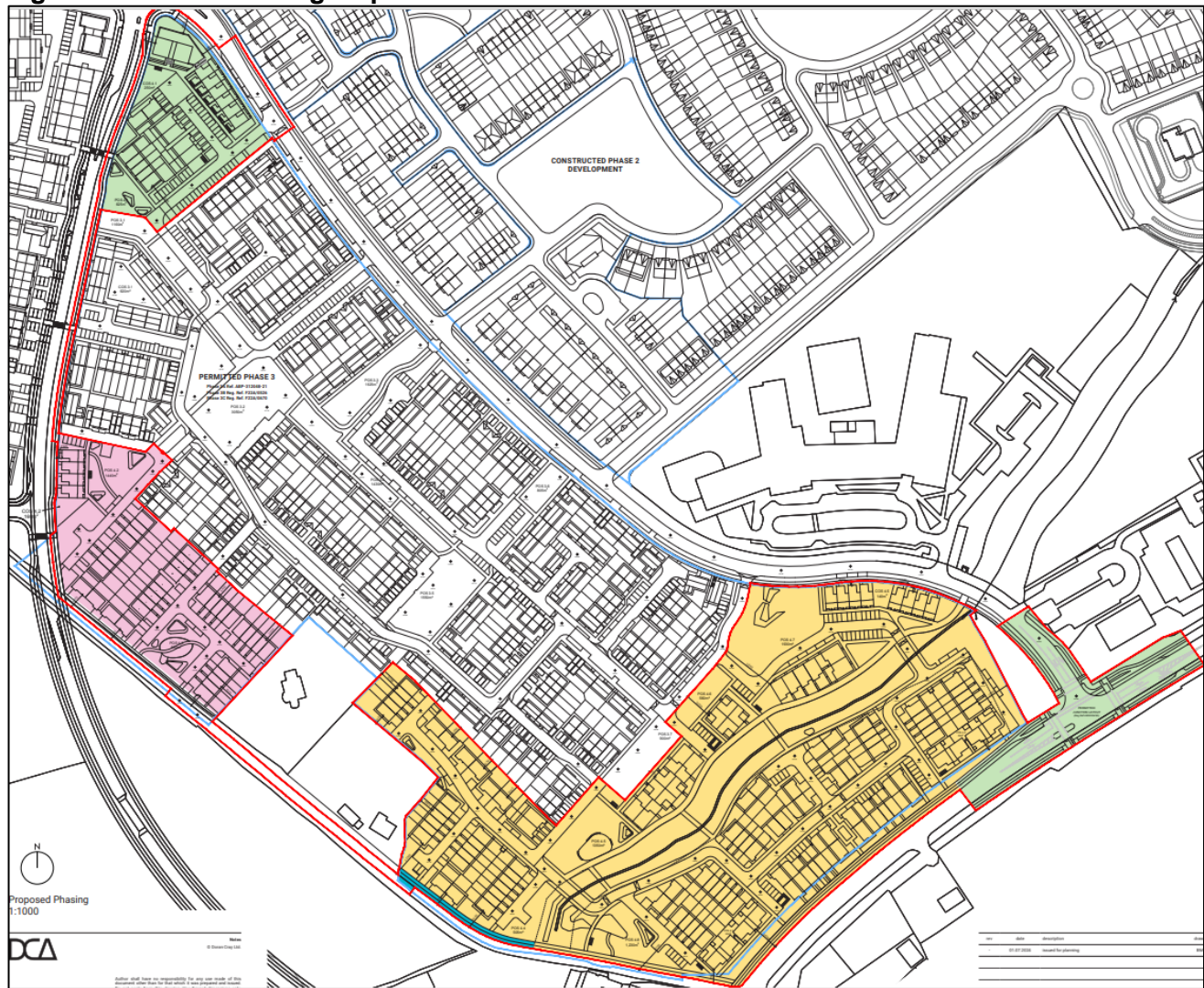
- The construction compound will include adequate welfare facilities such as washrooms, drying rooms, canteen and first aid room as well as foul drainage and potable water supply.
- Foul drainage discharge from the construction compound will be tankered off site to a licensed facility until a connection to the public foul drainage network has been established
- The construction compound's potable water supply shall be protected from contamination by any construction activities or materials
- The construction compound will be enclosed by a security fence
- Access to the compound will be security controlled and all site visitors will be required to sign in on arrival and sign out on departure
- A permeable hardstand area will be provided for staff carparking

- A separate permeable hardstand area will be provided for construction machinery and plant
- The construction compound will include a designated construction material recycling area
- A series of way finding signage will be provided to direct staff, visitors and deliveries as required
- All construction materials, debris, temporary hardstands etc. in the vicinity of the site compound will be removed off-site on completion of the works
- Site security will be provided by way of a monitored infrastructure systems such as site lighting and CCTV cameras, when deemed necessary.

2.21.8 MAIN STAGES/PHASES OF CONSTRUCTION

In summary the construction of the development will involve the following:

Figure 2.40: Site Phasing Map



Source: DCA drawing no. A507-DCA-XX-XX-DR-A-028

- Phase 1a – Site Set Up c.3 months to complete with approximately up to 20 staff employed
- Phase 1b – Setting out of sites and provision of services - 4-5 months and will run in tandem with phase 1d below and will involve up to 40 construction staff
- Phases 4A-4B-4C – Construction of Residential Units
- The construction of the residential units will, to a certain degree respond to the demand/sale of the units involved, however our client has already had a significant number of enquiries from

prospective purchasers, and it is anticipated that the construction progress will reflect this strong demand and will involve up to 100 no. construction staff (depending on the number of units being constructed at any one time). The Ladywell Phase 4 will be developed in 3 no. phases (and it is expected to take up to four (4) years to complete (subject to planning and market demand).

2.21.8.1 Site Accommodation & Site Parking

On site accommodation will consist of:

- Staff welfare facilities (toilets, canteen, offices/meeting rooms,)
- Materials storage areas and drop off Temporary water supply, electricity supply and foul drainage will be required for the new facilities.
- Connections to electricity & water are available close to the site boundary.
- Foul drainage with need to be taken to a vented holding tank for regular removal by suction tanker.
- Limited parking (c. 40-60 spaces depending on stages of construction) for construction personnel will be provided within the site for the period of construction.

2.21.8.2 Hours of Working

It is proposed that standard construction working hours should apply i.e.:

- 7am – 7pm Monday to Friday
- 8am – 2pm Saturdays (or as permitted by Fingal County Council)
- No works Sundays or on Public Holidays
- Work outside of normal hours shall only take place where written permission has been received from Fingal County Council. The location of any works anticipated to be undertaken outside normal working hours shall be limited and strictly defined

Any works proposed outside of these periods shall be strictly by agreement with the Local Authority in advance (such as Concrete pouring, foul or water main connections). Deliveries of material to site will be planned to avoid high volume periods. There may be occasions where it is necessary to make certain deliveries outside these times, for example, where large loads are limited to road usage outside peak times. There may be occasions where it is necessary to have deliveries within these times. The Contractor will develop, agree, and submit a detailed Traffic Management Plan, to FCC, for the project prior to commencement. The TMP will implement the relevant mitigation measures contained in the EIAR.

2.21.8.3 Construction of Services

Following on from completion of site clearance, demolition, site re-profiling works construction activities will focus on the installation of underground utilities to provide the infrastructure required for storm water drainage, foul water drainage, water supply, power and building utility systems.

2.21.8.4 Temporary Construction Works

During the construction phase it will be necessary to provide contractor welfare facilities for the workers. A site office and staff welfare facilities will be installed at a suitable location centrally within the overall site as part of the construction compound. All surplus plant and materials shall be stored in this location when not in use. Welfare facilities will include a canteen, drying room, toilets and first aid. Power will be provided using a small petrol generator. The petrol generator and fuel storage containers used for various items of plant will be located within a sealed containment bund.

Temporary portable toilet facilities will be provided on site. These units will be maintained and the waste collected therein will be disposed of using an appropriate contractor. Storage areas will be clearly identified and agreed with all relevant parties in advance of construction.

2.21.8.5 Cranes Tower

Cranes will not be required on site. Mobile cranes may be used for some activities. All materials being lifted by crane will be controlled by guide ropes and will only be carried out under the strict supervision of appropriately qualified and experienced banksmen.

2.21.8.6 Hoarding and Site Segregation

The new works will be hoarded off or fenced off from the public at all times. A 2.4m minimum high plywood painted timber hoarding will be provided along the Cookstown Road boundary after tree/hedge removal here and at any other areas around the site where the perimeter fence/hedge is not deemed sufficient for safety and security reasons. Heras type fencing will be used on short term site boundaries where appropriate to suit the works. The hoarding alignment and specification are to be confirmed by the Contractor prior to commencement. Controlled access points to the site, in the form of gates or doors/turnstiles, will be kept locked for any time that these areas are not monitored (e.g. outside working hours). During working hours, a gateman will control traffic movements and deliveries at any active site access to ensure safe access and egress to & from site onto the public roads. All personnel working on site must have a valid Safe Pass card and be inducted by the Main Contractor with regard to site specific information.

2.21.9 NOISE AND DUST MANAGEMENT

The main contractor will be required to be accredited with ISO14001 Environmental Management Systems. The main contractor will be required to mitigate the impact of the construction works and the mitigation measures set out in this EIAR.

2.21.10 CONSTRUCTION TRAFFIC MANAGEMENT PLAN (CTMP)

A Construction Traffic Management Plan (CTMP) will be developed by the main contractor and agreed with the Planning Authority and An Garda Síochána prior to commencement of development in the event of a grant of permission. The CTMP will implement the mitigation measures contained in this EIAR including the CEMP, (which includes a CTMP – section 4 refers), contained in Appendix D volume III of this EIAR.

2.21.10.1 Traffic Management & Construction Access

In general, the impact of the construction period will be temporary in nature and less significant than the operational stage of the proposed development (HGV vehicle movements not expected to exceed 4 vehicles per hour during the busiest period of construction works).

The works associated with the new development will result in additional traffic on the road network with the vehicles for the importation of earthworks fill material and the delivery of new materials for construction – concrete, concrete blocks, pipes, timber, roof tiles, glazing, road surfacing materials etc. Construction traffic access to the site will be via the LDR6 (with some minor construction traffic related to the construction of the residential cell at the Old Road. It is proposed that unloading bays should be provided for deliveries to the site within the hoarding perimeter. Appropriately demarcated storage zones will be used to separate and segregate materials. All deliveries to site will be scheduled to ensure their timely arrival and avoid the need for storing large quantities of materials on site. The storage area is to be located at least 50m from the site access to allow for the possibility of traffic queueing inside the site without any interference with the public road.

The mitigation will include the following matters:

- The contractor shall be responsible for and make good any damage to existing roads or footpaths caused by his own contractor's or suppliers transport to and from the site.

- The contractor shall at all times keep all public and private roads, footpaths entirely free of excavated materials, debris, rubbish, provide vehicle wheel wash and thoroughly clean all wheels and arches of all vehicles as they leave the site.
- The contractor shall confine his activities to the area of the site occupied by the works and the builders' compound, as far as practicably possible, during any particular phase of the development.
- Properly designed and designated entrance and egress points to the construction site for construction traffic will be used to minimize impact on external traffic.
- Flagmen shall be used to control the exit of construction vehicles from the site onto the public road, if required.
- Existing fire hydrants are to remain accessible as required.

Construction vehicle movements will be minimised through the implementation of the following measures contained in the CEMP, which forms part of the mitigation in this EIAR (See Appendix D Volume III of this EIAR):

- Consolidation of delivery loads to/from the site and scheduling of large deliveries to site to occur outside of peak periods;
- Use of precast/prefabricated materials where possible;
- 'Cut' material generated by the construction works will be re-used on site where possible, through various accommodation works.
- Adequate storage space on site will be provided;
- Construction staff vehicle movements will also be minimised by promoting the use of public transport.
- Car sharing among the construction staff following Covid-19 safety guidelines may be used to reduce traffic numbers. Public Transport: An information leaflet to all staff as part of their induction on site highlighting the location of the public transport services in the vicinity of the construction site.

2.21.11 REINSTATEMENT / ROAD CLEANING

Prior to the works commencing, detailed photographic surveys (condition schedules) of adjoining walls, roads, footpaths, fences etc. is to be prepared. Copies of the relevant parts are to be made available to adjoining owners and FCC. This record will form the basis of assessing repairs to adjoining areas in the future should a dispute arise as to their cause. Roadways are to be kept clean of muck and other debris. A road sweeping truck is to be provided as necessary, to ensure that this is so.

Reinstatement at completion of the works will involve:

- Testing and cleaning of all watermain in the development to the requirements of the IW / FCC prior to connection to the public watermain. This will reduce the risk of contamination to the public water supply when the new network is connected to the system.
- Repair of any damage to any adjacent public roadways, kerbs, grass verges etc. in accordance with FCC requirements.
- Reinstatement of all excavations to the requirements of FCC.
- Leaving the area in a neat and clean condition, removing all deleterious materials that may have been deposited during construction works.

2.21.12 CONSTRUCTION PHASING

The Phasing included in the CEMP is indicative to allow for flexibility in terms of the development. In terms of the Delivery and Phasing of Development the following will be the key stages:

• Phase 1a – Site Set Up

This task will take up to c.3 months to complete with approximately up to 20 staff employed and will involve consultation to Arborist, Archaeologist and Ecologist/Batman, site clearance (given the lack of existing

scrub/vegetation this will not be significant) set up site offices and contractors compound (at the Southern Boundary – as illustrated in Figure 3) and secure the construction site and erection of signage for site security purposes.

- **Phase 1b – Setting out of sites and provision of services**

Given the significant work involved in the provision of drainage services this stage will involve significant work and is estimated to take between 4-5 months and will run in tandem with phase 1d below and will involve up to 40 construction staff. This will involve the laying of sewers within the site, the installation of attenuation tanks, the provision of footpaths, lighting and roadways. As part of any works (i.e. provision of services) along the public areas/roads in the vicinity of the site, it will be ensured that the surface of the roads/areas will be re-instated to a high standard. Due to the catchment areas the site services associated with the phasing will be constructed as and when required to ensure that all surface water is attenuated prior to discharging to the existing surface water network.

- **Phases 1-5 – Construction of Residential Units**

The construction of the residential units will, to a certain degree respond to the demand/sale of the units involved, however our client has already had a significant number of enquiries from prospective purchasers, and it is anticipated that the construction progress will reflect this strong demand and will involve up to 100 no. construction staff (depending on the number of units being constructed at any one time). The Ladywell Phase 4 will be developed in one phase and it is expected to take up to four (4) years to complete (subject to planning and market demand).

2.22 ENERGY STATEMENT AND CLIMATE ACTION PLAN

The ENX Climate Action Energy Statement included with the LRD application sets out to demonstrate a number of methodologies in Energy Efficiency, Conservation and Renewable Technologies that will be employed in part or in combination with each other for this development.

The plan is to follow the requirements of the E.P.B.D. (Energy Performance of Buildings Directive), Building Regulations Technical Guidance Document (TGD) Part L and the Fingal County Development Plan 2023-2029 which are the current drivers for sustainable building design in Ireland.

The design team will achieve TGD Part L 2022 Nearly Zero Energy Buildings (NZEB) for the proposed development. A preliminary DEAP analysis has been undertaken on the residential units within the development to inform the design strategy, demonstrate compliance with the domestic Building Regulations Part L and to ensure that the targeted Building Energy Ratings (BERs) of A3 (or better) will be achieved.

A Thermal Dynamic Simulation Model of the communal areas has been constructed to demonstrate compliance with the non-domestic Building Regulations Part L and to ensure that the targeted BER of A3 (or better) will be achieved using the SEAI-approved NEAP methodology. This simulation model will be used to generate heating loads in an energy conscious manner and will also be used to inform key decisions in the building design such as the fabric performance metrics. NZEB will be achieved for these areas.

2.22.1 ENVIRONMENT / GLOBAL ISSUES

Increasing levels of greenhouse gases have been linked with changes in climate and predicted global warming. By far the biggest human contribution to the greenhouse gases is in emissions of carbon dioxide. The development is likely to increase carbon dioxide levels in the atmosphere by the embodied emissions in the building materials used, and in the operational energy consumed during the life of each building.

To minimise the embodied emissions impact, materials will be sourced locally where possible (reducing carbon dioxide emissions associated with transportation), and preference will be given to reusing

materials, and using materials in their natural state (reducing the emissions associated with processing). Chapter 7 of the EIAR sets out the potential impacts and mitigation in respect of Air Quality and Climate.

2.23 EMISSIONS AND WASTE

2.23.1 EFFLUENTS

Effluent arising from foul drainage from the proposed development will be discharged through piped systems to the local authority sewers. Operation of the development will involve the discharge of uncontaminated surface water from the impermeable areas to a proposed network all linking into the established public system in the environs. Details of the impacts and mitigation measures for surface water and foul drainage are recorded at Chapter 6 of this Environmental Impact Assessment Report.

Design Criteria

- Demand 446 l/dwelling/day
- Pipe Friction (Ks) 1.5 mm
- Minimum Velocity 0.75 m/s (self-cleansing velocity)
- Maximum Velocity 3.0 m/s (1:18 maximum pipe gradient)
- Frequency Factor 0.5 for domestic use

Residential Dwellings

Wastewater Discharge Calculation

- | | |
|---|--------------------|
| • Dry Weather Flow | 446 l/dwelling/day |
| • No. of Dwellings | 197 |
| • Post Development Average Discharge | 1.017 l/sec |
| • Post Development Peak Discharge (6x) | 6.102 l/sec |
| • Daily Foul Discharge Volume (446l per dwelling) | 87862l |

Non-Residential i.e. Retail

Wastewater Discharge Calculation

- | | |
|--|-----------------|
| • Assumed Occupancy | 20 persons |
| • Flow rate | 50 l/person/day |
| • (Based on IW Code of Practice for Wastewater Infrastructure – Appendix C, Flow Rates for Design) | |
| • Post Development Average Discharge (Based on 8-hour occupancy) | 0.012 l/sec |
| • Post Development Peak Discharge (4.5x) | 0.052 l/sec |
| • Daily Foul Discharge Volume | 1000 l |

Mitigation measures include measures designed to avoid, reduce, remedy, or offset impacts.

2.23.2 CONSTRUCTION WASTE DISPOSAL MANAGEMENT

Chapter 11 of the EIAR (Material Assets – Waste Management) and the Construction and Demolition Waste and By-Product Management Plan, prepared by AWN (included with the LRD application in

Appendix E Volume III of the EIAR), provides detail on the construction related waste management for the proposal.

The Objective of the Waste Management Plan is to minimise the quantity of waste generated by construction activities, to maximise the use of materials in an efficient manner and to maximise the segregation of construction waste materials on-site to produce uncontaminated waste streams for off-site recycling.

The Waste Management Plan shall be implemented throughout the construction phase of the development to ensure the following:

- That all site activities are effectively managed to minimise the generation of waste and to maximise the opportunities for on-site reuse and recycling of waste materials.
- To ensure that all waste materials are segregated into different waste fractions and stored on-site in a managed and dedicated waste storage area.
- To ensure that all waste materials generated by site activities are removed from site by appropriately permitted waste haulage contractors and that all wastes are disposed of at approved waste licensed / permitted facilities in compliance with the Waste Management Act 1996 and all associated Waste Management Regulations.

The calculated construction waste tonnage has been derived from the Building Research Establishment Environmental Assessment Method (BREEAM) which specifies that 11.1 tonnes of construction waste is generated for every 100m² of development area. Based on the combined building area contained in the Schedule of Accommodation for the development of c.37,237m², it has been calculated that up to c. 4,133 tonnes of construction waste may be produced.

2.23.3 CONTAMINATED SOIL

Where contaminated soils/materials are discovered or occur as a result of accidental spillages of oils or fuels during the construction phase, these areas of ground will be isolated and tested in accordance with the 2002 Landfill Directive (2003/33/EC) for contamination, and pending the results of laboratory WAC testing, will be excavated and exported off-site by an appropriately Permitted Waste Contractor holding an appropriate Waste Collection permit and that this hazardous material will be sent for appropriate treatment / disposal to an appropriately Permitted / Licenced Waste Facility.

2.23.4 CONSTRUCTION PHASE WASTE

There will be topsoil and subsoil excavated to facilitate construction of new foundations and the installation of underground services. The project engineers, Paul McGrail Consulting Engineers, have estimated that c. 25,939.14 m³ of material (topsoil and subsoil) will need to be excavated to do so. It is currently envisaged that c.12,740.42m³ the excavated material will be able to be retained and reused on site. It is currently envisaged that c. 13,198.72m³ material will need to be removed off-site. When material is required to be taken offsite it will be taken for appropriate off-site reuse, recovery, recycling and / or disposal.

The RWMP provides an estimate of the main waste types likely to be generated during the construction phase of the proposed development. These are summarised below:

Table 2.4: Predicted on and off-site reuse, recycle and disposal rates for construction waste

Waste Type	Tonnes	Reuse		Recycle / Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	344.4	10	34.4	80	275.5	10	34.4
Timber	292.2	40	116.9	55	160.7	5	14.6
Plasterboard	104.4	30	31.3	60	62.6	10	10.4

Metals	83.5	5	4.2	90	75.1	5	4.2
Concrete	31.3	30	9.4	65	20.3	5	1.6
Other	156.5	20	31.3	60	93.9	20	31.3
Total	1012.2		227.5		638.2		96.5

2.23.5 DOMESTIC MUNICIPAL WASTE/WASTE MANAGEMENT

Chapter 13 of the EIAR (Material Assets – Waste Management) and the Operational Waste Management Plan, prepared by AWN, provides detail on the domestic waste management for the proposal.

The total estimated waste generation for the proposed development for the main waste types, based on the AWN waste generation model (WGM), is presented:

Table 2.5: Estimated waste generation during the operational phase

Waste Type	Waste Volume (m ³ /week)	
	Residential Units (Combined)	Commercial Units (Combined)
Organic Waste	3.43	0.16
DMR	25.16	0.70
Glass	0.66	0.01
MNR	13.65	0.59
Confidential Paper	-	0.15
Total	42.91	1.61

2.23.6 EMISSIONS

The principal forms of air emissions relate to discharges from motor vehicles and heating appliances. With regard to heating appliances, the emission of nitrogen oxides and carbon monoxide will be minimised by the use of modern, efficient heating appliances and as a result, the potential impact is estimated to be negligible. Exhaust gases from motor vehicles will arise from car parking areas and will be discharged directly to the atmosphere. Chapter 7 and 8 of the EIAR sets out the potential impacts and mitigation in respect of Air Quality and Climate.

Noise may be considered in two separate stages, during construction, and when the development is operational. Construction related noise impacts are an inevitable short term limited inconvenience feature which, in general, is accepted by members of the public, subject to the standard controls typical of planning conditions attached to urban based development projects. These impacts can be reduced in a number of ways. It is standard practice to limit construction to normal working hours during the day. In addition, there are a number of regulations relating to noise during construction which the contractor will be expected to adhere to throughout the construction phase. Chapter 9 of the EIAR sets out the potential impacts and mitigation in respect of Noise and Vibration.

2.24 ALTERNATIVES EXAMINED/CONSIDERED

The EIA Directive (2014/52/EU) requires that Environmental Impact Assessment Reports include:

“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.”

Article 94 and Schedule 6, paragraph 1(d) of the Planning and Development Regulations 2001, (as amended), requires the following information to be furnished in relation to alternatives:

“(d) 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 presentation and consideration of various alternatives investigated by the project design team is an important requirement of the EIA process. This section of the EIAR document provides:

“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.”

This serves to indicate the main reasons for choosing the development proposed, taking into account and providing a comparison the environmental effects. Alternatives may be described at three levels:

- Alternative Locations.
- Alternative Designs.
- Alternative Processes.

The DHPLG 2018 EIA Guidelines state:

*“Reasonable alternatives may relate to matters such as project design, technology, location, size and scale. The type of alternatives will depend on the nature of the project proposed and the characteristics of the receiving environment. For example, some projects may be site specific so the consideration of alternative sites may not be relevant. It is generally sufficient for the developer to provide a broad description of each main alternative studied and the key environmental issues associated with each. **A ‘mini- EIA’ is not required for each alternative studied.**” (Emphasis added).*

This approach above is reflected in section 3.4.1 of the EPA EIAR Guidelines 2022 which state:

“The alternatives should be described with ‘an indication of the main reasons for selecting the chosen option’. It is generally sufficient to provide a broad description of each main alternative and the key issues associated with each, showing how environmental considerations were taken into account in deciding on the selected option. A detailed assessment (or ‘mini-EIA’) of each alternative is not required.”⁷

Pursuant to Section 3.4.1 of the EPA EIAR Guidelines 2022, the consideration of alternatives also needs to be cognisant of the fact that *“Clearly, in some instances some of the alternatives described below will not be applicable – e.g. there may be no relevant ‘alternative location’ ...”*

The EPA EIAR Guidelines 2022 are also instructive in stating:

⁷ Ref CJEU Case 461/17

“Analysis of high-level or sectoral strategic alternatives should not be expected within a project level EIAR... It should be borne in mind that the amended Directive refers to ‘reasonable alternatives... which are relevant to the proposed project and its specific characteristics.’”

The consideration of the main alternatives in respect of the development of the subject lands was undertaken by the Design Team and has occurred throughout an extensive and coordinated decision-making process, over a considerable period of time. The main alternatives considered are identified below.

2.24.1 ALTERNATIVE LOCATIONS

The 2018 Department of Housing Planning and Local Government (DHPLG) Guidance on the preparation of EIARs notes specifically that the consideration of some types of alternatives, such as alternative locations, may not be appropriate in all cases. EIA is concerned with projects and the Environmental Protection Agency’s guidelines (2022) state that, in some instances, neither the applicant nor the competent authority can realistically be expected to examine options that have already been previously determined by a higher authority, such as a national plan or regional programme for infrastructure which are examined by means of a Strategic Environmental Assessment (SEA), the higher tier form of environmental assessment. As the subject site has been identified to accommodate the uses proposed, it is not considered appropriate to evaluate alternative locations in the EIAR.

The EIAR Guidelines 2022 also note that:

“Higher level alternatives may already have been addressed during the strategic environmental assessment of relevant strategies or plans. Assessment at that level is likely to have taken account of environmental considerations associated, for example, with the cumulative impact of an area zoned for industry on a sensitive landscape.”

This is of relevance to the proposed development of the site. On the strategic or ‘higher’ matters of already determined policy, we refer to the Fingal County Development Plan 2023-2029 which make reference to strong policies in support of the development of Balbriggan.

2.24.2 DO-NOTHING ALTERNATIVE

A “do-nothing” alternative was considered to represent an inappropriate, unsustainable and inefficient use of these residential zoned land; particularly having regard to the opportunity to provide much needed housing for Fingal County Council. The suitability of the lands for development, within an established development area of Balbriggan and the application site’s location adjacent to existing amenities, schools, public transport and good road infrastructure were also key considerations.

The site is zoned for residential development under the Fingal County Development Plan 2017-2023 and as such, consideration of alternative sites is not pertinent. In effect, an alternative location in this instance i.e., a ‘do- nothing’ alternative for the subject site, would mean that these residential zoned lands would not be utilised for the purposes of meeting the need for new residential accommodation within Balbriggan. If development does not occur sequentially from the existing development footprint, it is likely that pressures for the development of land which is either un-zoned or un-serviced and not as close to the town centre would be greater. This would lead to a dispersed and unsustainable form of development.

A “do-nothing” scenario was considered to represent an inappropriate, unsustainable and inefficient use of these strategically located residential zoned lands, within Balbriggan. The suitability of the lands for development, within an established development area of the County were also key considerations.

From an environmental perspective a ‘do nothing’ approach is otherwise likely to result in a neutral impact on the environment in respect of material assets, land, water, air, climate, cultural heritage, biodiversity

and landscape. Ultimately, a ‘do-nothing’ scenario was considered to represent an inappropriate, unsustainable and inefficient use of these strategically positioned, zoned, urban lands.

2.24.3 ALTERNATIVE USES

In addition to residential use, there are other land uses which are permitted in principle on these lands. It is not considered that an alternative comprising one of the alternative uses would result in the best use of these lands, particularly having regard to the general acknowledged need for housing. The environs of the subject site are largely residential in nature interspersed with some commercial/retail and educational uses. In this context, the proposal now the subject of this application comprises appropriate land uses in accordance with the proper planning and sustainable development of the area. Nevertheless, the proposed development includes some small scale ‘top-up’ retail floorspace, which is allowable under the land use zoning objective.

2.24.4 DESCRIPTION OF ALTERNATIVE PROCESSES

The relevance of alternative processes and technologies is limited in the case of this EIAR having regard to the nature of the proposed development, which is primarily for a residential development. The Climate and Energy Statement prepared by ENX Consulting Engineers identifies the energy standards with which the proposed development will have to comply and also sets out the overall strategy that will be adopted to achieve these energy efficiency targets. The dwellings will be required to minimise overall energy use and to incorporate an adequate proportion of renewable energy in accordance with Building Regulations Part L 2022, Conservation of Energy & Fuel.

The building fabric has been selected to meet the requirements of Part L building Regulations. The incorporation of these elements and technologies into the scheme will ensure higher performance and improved building sustainability when compared to alternative out-dated, less energy efficient materials and technologies.

It is noted the proposed construction works comprise relatively standard building construction processes, which comprise some timber frame elements which are more sustainable compared to 100% block work. With reference to the operational phase, no new, unusual, or technically challenging operational techniques are required, as such no alternative operational processes have been considered.

2.24.5 COMPARISON OF ALTERNATIVE DESIGNS AND LAYOUTS

The proposed residential development has been prepared in accordance with the requirements of the National Planning Framework, the Regional Spatial and Economic Strategy for the Mid-East area as well as the relevant Section 28 Guidelines including those relating to Urban Development and Urban Heights 2018, the Apartment Guidelines 2023 and the Compact Settlement Guidelines 2024 as well as where relevant the Fingal County Development Plan 2023-2029 and has been the subject of pre-application discussions with the Planning Authority prior to lodgement of the planning application.

Alternative site layouts and siting progressed throughout the design process as part of the development, in order to minimise the impact on the receiving environment at the earliest opportunity. The initial stage involved a constraints analysis of the land within the proposed development site to identify all high-level constraints and aggregate them against the site to allow a suitable layout to be developed.

The following analyses alternatives development options considered for the site which were incorporated into the scheme as the proposals progressed through pre-application discussions with the Planning Authority.

2.24.5.1 Alternative no. 1 - F07A/1249/ABP Ref: PL06F.231457 & F08A/1329 (part)

The first alternative considered by the design team was to consider the permitted layout under Planning Reg. Ref. F07A/1249/ABP Ref: PL06F.231457 & F08A/1329.

Figure 2.41: Alternative 1 Site Layout Plan F07A/1249 & F08A/1329 (as relating to Phase 3 lands)



2.24.5.2 Comparison of Environmental Effects

Having reviewed the proposal it was considered that the previous layout encroached into the riparian zone unduly and did not include sufficient permeability between the northern and southern portions of the subject lands. The proposed development did not meet the requirements of DMURS (in respect of permeability). The open space lacked an overall hierarchy and was not well distributed throughout the site, providing a sole urban square in the extreme northern portion of the subject site.

Having regard to current best practice on the design and layout of residential scheme and having regard to guidance provided in the Design Manual for Urban Roads and Streets 2013 and more up to date standards in design.

The proposal would have resulted in the removal of more hedgerows leading to a negative impact on hedgerows and biodiversity. The proposals would have entailed the use of large-scale underground attenuation, which would be negative in terms of water and soils. The impacts to Cultural Heritage would be neutral as the development of the lands would result in the preservation of archaeological features in all alternatives.

The layout failed to provide a clear hierarchy of roads and streets in accordance with the requirements of DMURS. Furthermore, the over provision of streets resulted in the inefficient use of zoned land. Based on the foregoing a number of alternative iterations were explored, which deviated from Alternative no. 1.

2.24.5.3 Alternative no. 2 – Series of layouts



The applicant considered a series of alternative layouts which were discounted due to additional negative visual impact (local centre structure was considered bulky). In addition, the mix of the layouts was not considered suitable.

2.24.5.4 Alternative no. 3 – LRD Opinion Request

The second alternative considered relates to the layout submitted as part of the LRD opinion request.

Figure 2.42: Alternative no. 3 – LRD Opinion Request



2.24.6 PROPOSED PREFERRED ALTERNATIVE (NO. 4) LRD APPLICATION- MAIN REASONS FOR THE OPTION CHOSEN, INCLUDING A COMPARISON OF THE ENVIRONMENTAL EFFECTS

The final layout proposed is not considered to give rise to any significant adverse environmental impacts. Mitigation measures to be implemented at construction and operational phases of the project are summarised in Chapter 17 (Summary of Mitigation and Monitoring Measures).

2.24.6.1 Population and Human Health

The alternatives examined would result in similar effects as the design is set within the parameters of the zoning for the subject lands. Through improvements to the mix of uses and providing community and retail development in tandem with development of residential uses, the preferred alternative would be a positive effect at a local context and the effect would be permanent. The introduction of the duplex units along the Clonard Road is considered to be positive as they provide a greater sense of place and passive surveillance.

2.24.6.2 Biodiversity

With reference to Biodiversity the implementation of the preferred alternative would be the proposed development will not result in the loss of habitats or species of high ecological significance and will not have any significant effects on the ecology of the wider area. Similar effects would arise from the other alternatives examined. The preferred alternative includes additional SUDs and native planting which will improve the biodiversity of the project site compared to the other alternatives.

2.24.6.3 Land and Soils

Development of the land would require site clearance and excavations to facilitate the construction of the buildings and services. The effect would be not significant and negative due to the loss of underlying soils. However, this is consistent with achieving compact growth. The effect is locally negative, with a significance rating of imperceptible to not significant and of permanent duration. Similar effects would arise from the other alternatives examined. Alternative no. 3 includes additional surface water SUDs measures (and includes detention basins for attenuation) which is long term positive, slight. This is similar for the second and final alternative layout, which is positive compared to alternative no. 1.

2.24.6.4 Water/Hydrology

The implementation of the preferred alternative would require sustainable urban drainage (SuDS) measures in line with the requirements of the Greater Dublin Strategic Drainage Study (GDSDS). The preferred alternative includes additional surface water SUDs measures which is long term positive, slight.

The significance of the identified impacts will be reduced to a “*Not significant*” residual impact on the identified hydrological/ hydrogeological receptors. Similar effects would arise from the other alternatives examined.

2.24.6.5 Air Quality and Climate

The construction phase of the development would result in slight, local negative effects on the air quality for the preferred alternative. With reference to the operational phase the preferred alternative would result in a not significant, local, negative, long-term effects. Similar effects would arise from the other alternatives examined for both the construction and operation phases.

2.24.6.6 Noise and Vibration

The impact of the construction phase will result in an increase in daytime noise levels at the closest receptors to the site and slight, local negative effects. The operational phase of the development will not adversely impact the existing noise climate at local receptors. The effects are similar across all the alternatives examined.

2.24.6.7 Landscape and Visual

Any proposed viable development will give rise to impacts of a similar nature. While the intensification of land use, as it changes from now agricultural into a residential development is a change that cannot be

mitigated, the proposals reflect best practice in residential area layout, reflect the concepts in the wider zoned lands and will consolidate the urban area here with an overall beneficial effect locally and to the wider surrounding area.

The introduction of the duplex units along the Clonard Road is considered to be positive as it adds a sense of place and presence at the entrance to Balbriggan.

2.24.6.8 Material Assets

All of the alternatives would place additional demand on existing infrastructure including drainage and water supply. Irish Water have confirmed the feasibility of the proposed development, and the effect is neutral, imperceptible, and permanent. The alternative for the LRD application is more DMURS compliant compared to the other alternatives which is positive.

2.24.6.9 Cultural Heritage

Ground disturbances associated with the construction of the proposed development have the potential to have a direct negative impact on the unrecorded sites. All alternatives examined would be similar in terms of impacts.

2.24.6.10 Risk Management

All alternatives relate to the construction of a residential development and therefore the comparison of alternatives is similar.

With reference to the final layout, the iterative process outlined above, which included alternative site layouts were considered with the objective of producing a new high quality residential development, which has undergone a robust consideration of relevant alternatives having regard to the comparison of environmental effects and meets the requirements of the EIA Directive, based on the multidisciplinary review across all environmental topics.

2.24.6.11 Summary

With reference to the final layout, the iterative process outlined above, which included alternative site layouts were considered with the objective of producing a new high quality residential development, which has undergone a robust consideration of relevant alternatives having regard to the comparison of environmental effects and meets the requirements of the EIA Directive, based on the multidisciplinary review across all environmental topics.

The proposed development provides for new residential development on lands zoned for residential use under the Fingal County Development Plan which was subject to the SEA process. As such, consideration of alternative sites for the construction of houses and apartments proposed in this residential development was not considered necessary.

Based on a comparison of the environmental effects, as described for each Iteration above, together with the regulatory requirements of the Development Plan, it is considered the proposed development has been selected for the following reasons:

- Includes SUDs features (and exclusion of underground attenuation tanks) within the scheme which is positive from a water/biodiversity perspective.
- The proposed development results in a high degree of permeability, resulting in a highly connected neighbourhood with strong connections which will have positive impacts on population and human health.
- Avoids significant environmental impacts on the receiving environment.
- Includes duplex units adding a sense of place and positive from a landscape and visual perspective.

In summary, the overall design of the proposed development considers all environmental effects and provides for a sustainable development that has been optimised to emphasise positive environmental effects whilst reducing negative environmental impacts wherever possible. The preferred alternative is not considered to give rise to any significant adverse environmental impacts following the mitigation measures to be implemented at the construction and operational phases. The final proposed scheme also responds to the characteristics and constraints of the subject site vis a vis the previous iterations of the scheme and the alternative layouts considered.

PROCESSED
06/08/2024

3.0 POPULATION & HUMAN HEALTH

3.1 INTRODUCTION

The 2014 EIA Directive (2014/52/EU) has updated the list of topics to be addressed in an EIA and has replaced ‘Human Beings’ with ‘Population and Human Health’. This chapter also meets the requirement for assessment of ‘Human Beings’ as per Schedule 6 of the Planning and Development Regulations 2001 (as amended).

This chapter of the EIA was prepared by Rory Kunz, BA (MOD), MScERM, MAT&CP, Dip EIA Mgmt., Executive Director with John Spain Associates who has a Masters in Environmental Resource Management and a Diploma in EIA Management (both from UCD) as well as a Masters in Town and Country Planning. In addition, Rory is a corporate member of the of the Irish Planning Institute and has 21 years of experience of Environmental Impact Assessment and urban development.

In preparing this chapter, consideration has been given to the other inputs to this EIA including, in particular, the chapters addressing Air Quality and Climate, Noise and Vibration, Traffic as well as Risk Assessment Chapter (accidents or disasters) and the separate reports addressing Construction and Demolition Waste Management, and the Construction and Environmental Management Plan.

Population and Human Health comprise an important aspect of the environment to be considered. Any significant impact on the status of human health, which may be potentially caused by a development proposal, must therefore be comprehensively addressed.

Population and Human Health is a broad ranging topic and addresses the existence, activities and wellbeing of people as groups or ‘populations’. While most developments by people will affect other people, this EIA document concentrates on those topics which are manifested in the environment, such as new land uses, more buildings or greater emissions.

3.2 STUDY METHODOLOGY

At the time of writing there is no specific guidance from the EU Commission on the 2014 EIA Directive to indicate how the term ‘Human Health’ should be addressed. However, the European Commission’s *Guidance on the preparation of the Environmental Impact Assessment Report* (2017) does reference the requirement to describe and, where appropriate, quantify the primary and secondary effects on human health and welfare. Moreover, the European Commission guidance states the following in relation to the assessment of Human Health:

“Human health is 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 pollutants) are obvious aspects to study. In addition, these would concern the commissioning, operation, and decommissioning of a Project in relation to workers on the Project and surrounding population.”

EU Commission’s SEA Implementation Guidance from 2003, as it gives an indication of how ‘human health’ should be considered in terms of environmental assessment and notes:

“The notion of human health should be considered in the context of the other issues mentioned [in the list of factors to be identified, described and assessed] and thus environmentally related health issues such as exposure to traffic noise or air pollutants are obvious aspects to study.” (para 5.26).

In accordance with this approach to Human Health espoused in the Commission Guidance, this chapter addresses human health in the context of other factors addressed elsewhere in further detail within the EIAR where relevant. Relevant factors identified include inter alia water, air quality, noise, and the risk of major accidents and disasters.

In addition, this chapter of the EIAR has been prepared with reference to recent national publications which provide guidance on the 2014 EIA Directive including the Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018) and the Guidelines on the information to be contained in environmental impact assessment reports, published by the EPA in May 2022.

A site visit was undertaken to appraise the location and likely and significant potential impact upon human receptors. Published reference documents such as Central Statistics Office Census data, the National Planning Framework 2040, the Regional Spatial and Economic Strategy, the Fingal County Council Development Plan 2023-2029 were also examined.

The 2022 EPA Guidelines on the information to be contained in environmental impact assessment reports, published by the EPA states that *“In an EIAR, the assessment of impacts on population & human health should refer to the assessments of those factors under which human health effects might occur, as addressed elsewhere in the EIAR e.g. under the environmental factors of air, water, soil etc...”*

This chapter of the EIAR document focuses primarily on the potential likely and significant impact on Population, which includes Human Beings as required under the Schedule 6 of the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (as amended), and Human Health in relation to health effects/issues and environmental hazards arising from the other environmental factors. Where there are identified, associated and inter-related potential likely and significant impacts which are more comprehensively addressed elsewhere in this EIAR document, these are referred to. The reader is directed to the relevant environmental chapter of this EIAR document for a more detailed assessment.

This chapter has been prepared having regard to the following guidelines;

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 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 – (EPA, 2022);

The impact assessment section of this chapter follows the terminology (where applicable) used in the EPA Guidelines as set out in Chapter 1 of this EIAR.

3.3 EXISTING RECEIVING ENVIRONMENT (BASELINE SCENARIO)

3.3.1 INTRODUCTION

A description of the relevant aspects of the current state of the environment (baseline scenario) in relation to population and human health is provided below. Specific environmental chapters in this EIAR provide a baseline scenario relevant to the environmental topic being discussed. Therefore, the baseline scenario for separate environmental topics is not duplicated in this section; however, in line with guidance provided by the EPA and the Department, the assessment of impacts on population and human health refers to those environmental topics under which human health effects might occur, e.g. noise, water, air quality etc.

An outline of the likely evolution without implementation of the project as regards natural changes from the baseline scenario is also provided.

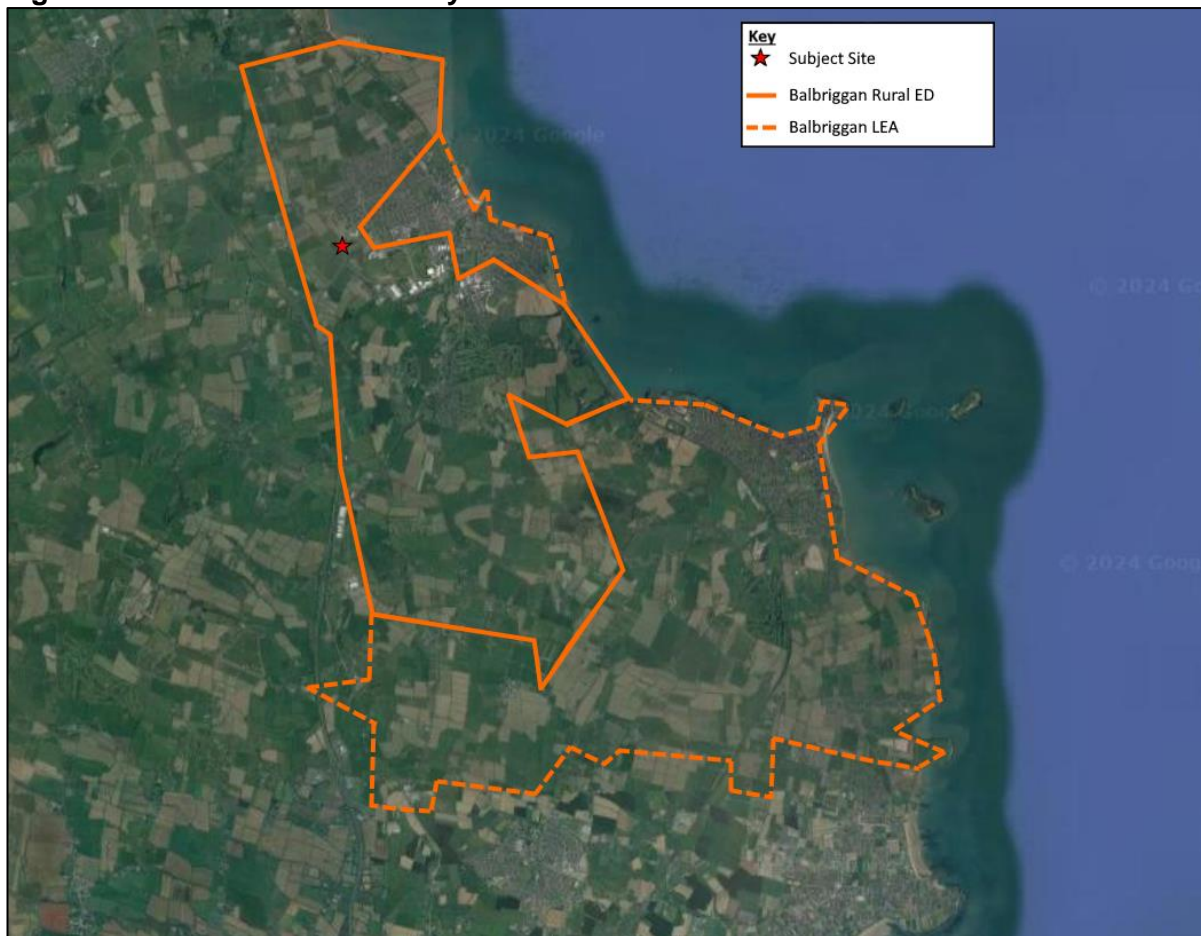
The existing environment is considered in this section under the following headings:

- Economic Activity;
- Social Patterns;
- Land-Use and Settlement Patterns;
- Employment; and
- Health & Safety.

The subject site consists of three main parcels of land located to the east of Bóthar Chluain Ioraird and to the west of Taylor Hill Boulevard, adjacent to the western environs of the built envelope of Balbriggan town. The proposed development will form an extension and next phase of development (Phase 4 Folkstown) as the next phase for the lands at Ladywell in Balbriggan.

The subject lands comprise an undeveloped, greenfield site of c 7.15 hectares and is situated to the north of Clonard Road (R122) between Bóthar Chluain Ioraird to the west and Taylor Hill Boulevard to the east. The lands are located approximately 700m from the Millfield Shopping Centre, c. 820m from the Castle Mill Shopping Centre and c. 1.7km from Balbriggan Town Centre including Balbriggan train station. There is a minor vehicle access point to the site from Taylor Hill boulevard however future appropriate access is dependent on the roads infrastructure development and upgrades proposed and permitted under the subject application and previous phases of the overall development respectively.

Figure 3.1: Catchment and Study Area



Google Maps

Source:

The subject site is located within the boundaries of the Electoral division (ED) of Balbriggan Rural as defined by the Central Statics Office. This Electoral Division comprises the immediate catchment area of the subject site, to include some more urban estates to the west and north and a substantial, predominantly-rural area to the south.

The ED's comprising the wider study area of the Balbriggan Local Electoral Area (LEA) include the Balbriggan Urban, Skerries and Holmpatrick EDs. Figure 3.1 indicates the geographical extent of the immediate catchment and the wider study area.

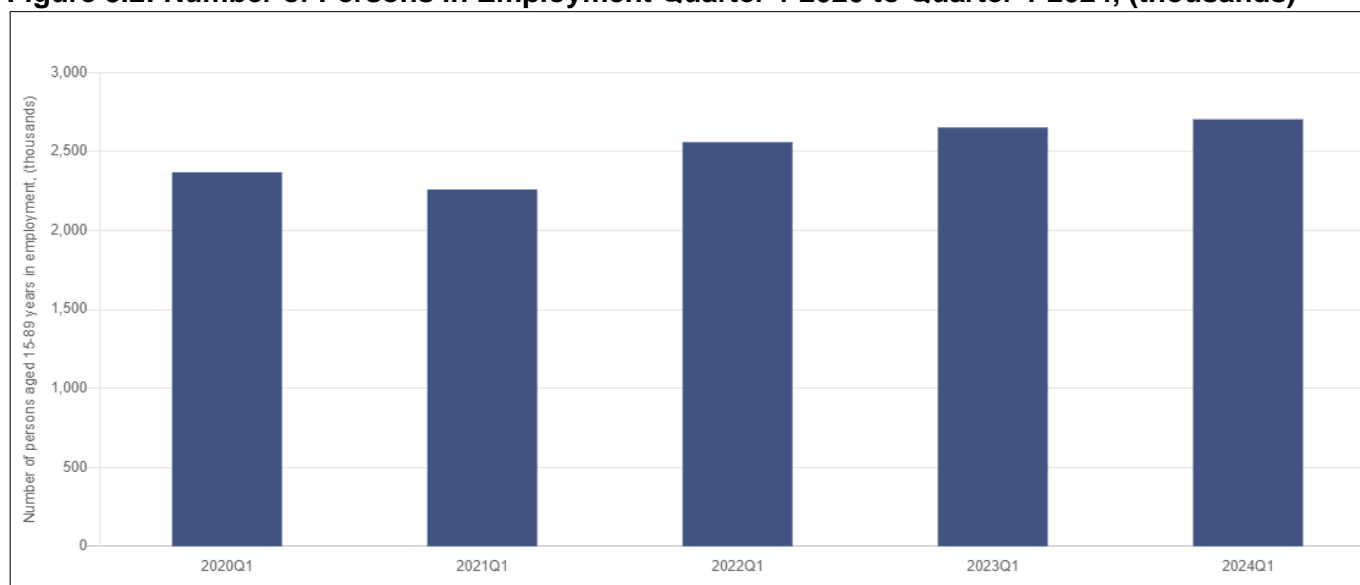
3.3.2 EMPLOYMENT & ECONOMIC ACTIVITY

The CSO's Labour Force Survey for Q1 2024⁸, published on the 23rd of May 2024 states that the number of persons aged 15-89 years in employment increased by 51,500 or 1.9% to 2,704,200 persons in the 12 months to Q1 2024. The annual change of 1.9% is the lowest annual increase in three years. According to the CSO, there were 115,200 unemployed people aged 15-74 years in Q1 2024 using International Labour Organisation (ILO) criteria, with an associated unemployment rate for those aged 15-74 of 4.1%, up slightly from 4.0% in Q1 2023.

The survey also notes that the unemployment rate among those aged 15-24 years (the youth unemployment rate) was 8.8% in Q1 2024, up from 8.6% in Q1 2023.

The estimated Labour Force (i.e. the sum of all persons aged 15-89 years who were either employed or unemployed) stood at 2,819,400 in Q1 2024, a rise of 2.0% (55,400) from Q1 2023. The estimated participation rate in Q1 2024 was 65.0%, unchanged from Q1 2023.

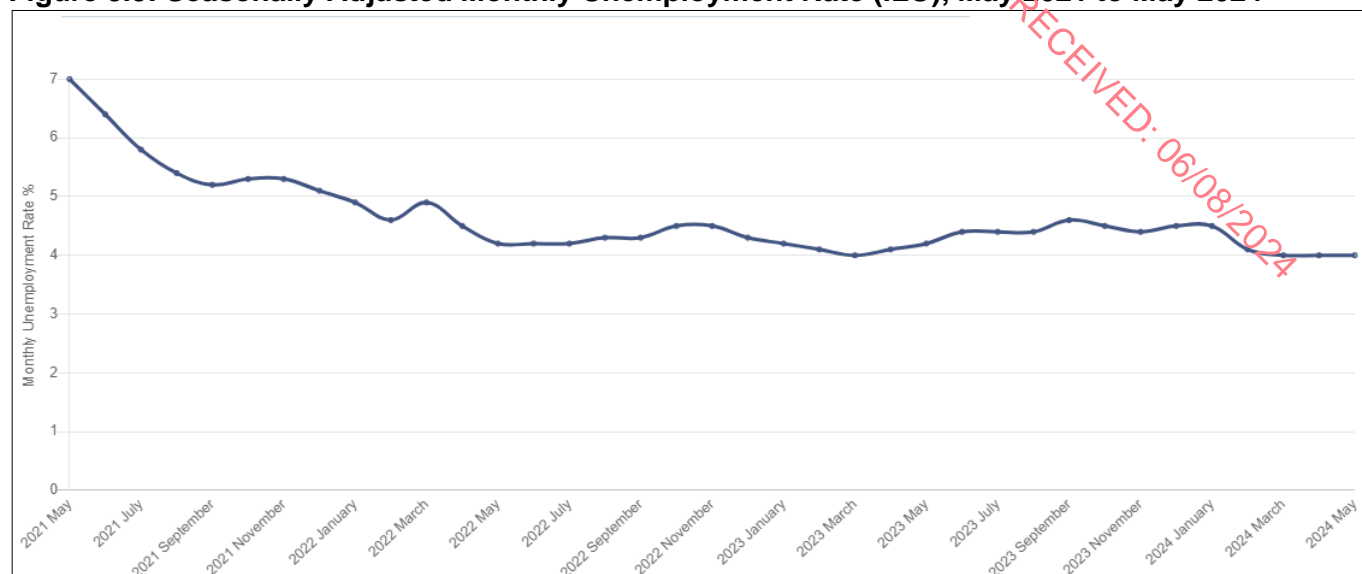
Figure 3.2: Number of Persons in Employment Quarter 1 2020 to Quarter 1 2024, (thousands)



Source: CSO Figure 2.1

The CSO Monthly release (7th June 2024) notes that *“In May 2024, the seasonally adjusted unemployment rate was 4.0%, which was the same as the revised April 2024 rate. On an annual basis, the seasonally adjusted unemployment rate fell to 4.0% in May 2024 from a revised rate of 4.2% in May 2023.*

⁸ [Labour Force Survey Quarter 1 2024 - Central Statistics Office](#)

Figure 3.3: Seasonally Adjusted Monthly Unemployment Rate (ILO), May 2021 to May 2024

The seasonally adjusted number of people unemployed was 111,700 in May 2024, compared with 111,800 in April 2024. There was a decrease of 3,700 in the seasonally adjusted number of people unemployed in May 2024 when compared with a year earlier.

The seasonally adjusted number of unemployed males stayed the same at 56,600 in May 2024, compared with April 2024. The seasonally adjusted number of unemployed females in May 2024 also remained unchanged from April 2024 at 55,100.

The Economic Social Research Institute (ESRI) quarterly economic commentary for Summer 2024 notes that *‘Headline and underlying indicators of the Irish economy both suggest the economy will grow in a robust fashion in 2024 and 2025. This is driven by a better-than-expected international outlook and robust domestic growth. We now believe MDD will grow by 2.2 per cent in 2024 and by 2.9 per cent in 2025. This is largely influenced by an expected increase in real income this year and next of approximately 3 per cent per annum.’*

The ESRI commentary outlines that *“Underpinning this increase in real income is a strong expected increase in nominal income and a continued deceleration in the rate of inflation in both 2024 and 2025 of 2.3 and 1.9 per cent respectively.”*

The Commentary highlights the important role played by net inward migration in increasing the labour force in the domestic economy and, by association, the potential output of the economy. Given the low rate of unemployment and the robustly growing domestic economy, the issue of capacity constraints is critical. Recent data from the Housing Commission suggest an upward revision in housing supply targets will be needed to cater for demographic demand for housing. • Overall, it is evident that while housing supply is on an upward trajectory, it needs to increase at a faster pace if it is to meet the underlying demand for housing in the Irish economy. In addition to housing supply, critical infrastructure around the carbon transition will also draw on resources, putting pressure on labour in the construction sector in particular

Nevertheless, the steady increases in national levels of employment, and the decreases in the number of unemployed persons is as a result of the significant revival of the Irish economy after the influence of the COVID-19 pandemic on the Irish economy and workforce. The magnitude and extent of the national economic rebound speaks to the resilience and efficiency of the Irish economy and workforce which could have a beneficial effect heading into the unknown economic future starting to arise following inflationary pressures on energy and food markets and the increased levels of in-migration following Russia’s war in Ukraine. Therefore, Ireland must prepare to cope with this unknown and must ensure that adequate provision of social and affordable housing is available to facilitate the potential additional influx of

individuals and families in search of such housing options due to the economic shock and downturn experienced as a result of the cost-of-living crisis. The proposed development will aid in this endeavour through its provision of a high-quality residential mix at a strategic location, which will deliver sustainable economic development, will significantly contribute to the development of the area and will positively impact on the existing and future population of the region, through its housing, connections, amenity provision and potential future employment opportunities.

The Central Bank of Ireland Quarterly Bulletin Q1 2024 released in June 2024 forecasts for economic growth in Ireland for the remainder of the year and beyond. This document states that the *“Moderate growth in economic activity in the first half of 2024 is projected to continue over the forecast horizon, consistent with the economy operating around its medium-term potential. Growth in Modified Domestic Demand picked up in Q1 2024 with renewed growth in investment in machinery and equipment by large multinationals. Further increases in residential construction points to a positive outlook for overall modified investment. With improvements in real incomes underpinning consumer spending, overall MDD is forecast to grow at an annual average rate of 2.2 per cent per annum from 2024-26. The drag on goods exports arising from sector-specific issues in the pharma and ICT sectors in 2023 appears to be waning and stronger growth in net exports is anticipated from 2024, aided by a gradually improving external environment.”*

As such, the above sources demonstrate that the national economy will continue to remain steady and improve. This, in turn, results in increased levels of economic activity, increases in investment and employment therefore, results in a demand for increased housing provision to accommodate a growing workforce and population.

3.3.3 SOCIAL PATTERNS

For the purposes of this EIAR, a review has been carried out of data from the 2011, 2016 and the 2022 Census of Population in order to identify any significant changes in population levels and age profile at national, regional, county, city and local levels. The 2022 Census results provide for an overview of the current population, employment and economic statistics and trends of the State.

A review was also carried out of the census data relating to social class and household size at each of these levels. The following section provides a summary description of the existing environment in terms of each of these indicators.

3.3.3.1 Population

The census data illustrates that the population of the Irish State was 5,149,139 persons in 2022. This is the first time that a census has recorded a population of over five million people in over 170 years. The population of the Greater Dublin Area increased by 278,449 persons, or 15.4% since 2011. The population of Dublin County increased by 14.5% between 2011 and 2022 to now comprise 1,458,154 persons or an increase of some 185,085. The population of Fingal is now 330,506 persons, an increase of 20.6% compared to 2011.

Table 3.2 below shows the population of the State, the Greater Dublin Area, Dublin County and City, Fingal, the wider study area of Balbriggan LEA and the Balbriggan Rural electoral division area for 2006, 2011 and 2016. (It should be noted that that the Greater Dublin Area (GDA) includes Dublin County as well as Wicklow, Kildare and Meath. Dublin County includes Fingal, South Dublin, Dún-Laoghaire Rathdown and Dublin City).

Table 3.1: Population at State, Regional, County and Local Level, 2011- 2022

Area	2011	2016	2022	Change 11 - 22	% change
State	4,588,252	4,757,976	5,149,139	560,887	12.2%
Greater Dublin Area	1,804,156	1,904,806	2,082,605	278,449	15.4%

Dublin County	1,273,069	1,345,402	1,458,154	185,085	14.5%
Dublin City	527,612	553,165	592,713	65,101	12.3%
Fingal	273,991	296,020	330,506	56,515	20.6%
Balbriggan LEA	34,252	36,570	40,476	6,224	18.2%
Balbriggan Rural ED	15,140	16,495	19,347	4,207	27.8%

Source: Census of Population 2011, 2016 and 2022

Table 3.2 indicates that the population of the state grew from approximately 4.5 million to 5.1 million between 2011 and 2022, representing an increase of 12.2% in 11 years. The population of Dublin County increased by 14.5% (185,085 persons) over the same period while Dublin City grew by 12.3% (65,101 persons) between 2011 and 2022. The population of Fingal County grew faster than the city with a growth rate of 20.6%. The lower population growth rate experienced in Dublin City compared to the increase experienced in Fingal County may reflect the restricted availability of development land within the area. There is an abundance of available land in Fingal and if its potential is realised, the county would be more than able to accommodate the significant quantities of housing needed to facilitate such a growing population. The subject lands at Folkstown, Balbriggan would see such potential realised through the proposed development.

Population growth within the wider study area of Balbriggan LEA also rose rapidly from 2011 to 2022 by 18.2%, while the Balbriggan Rural electoral division followed suit with major increases in its population of 27.8% since 2011 to 2022. This trend of significant growth in the surrounding area of Balbriggan brings with it a proportional increase in demand for housing and associated services provision in the area to accommodate present and future population growth in the area. The proposed development at Phase 4, Folkstown would help alleviate such demand pressures while also providing much needed social and affordable housing options for a range of family and individual demographics.

3.3.3.2 Age Profile

Table 3.3 shows the population of the State, the Greater Dublin Area, Dublin County and City, Fingal, the wider study area of Balbriggan LEA and the Balbriggan Rural ED level for 2011, 2016 and 2022.

Table 3.2: Age Profile at State, County and Local Level, 2006-2011-2016

Area	0-14	15-24	25-44	45-64	65+
State 2011	21.3%	12.6%	31.6%	22.7%	11.7%
State 2016	21.1%	12.1%	29.5%	23.8%	13.4%
State 2022	19.7%	12.5%	27.6%	25.1%	15.1%
GDA 2011	20.8%	13.1%	34.2%	21.5%	10.4%
GDA 2016	20.7%	12.4%	32.5%	22.5%	11.9%
GDA 2022	19.4%	12.8%	30.5%	24%	13.3%
Dublin County 2011	19.3%	13.6%	34.9%	21.3%	10.9%
Dublin County 2016	19.3%	12.7%	33.8%	22.0%	12.2%
Dublin County 2022	18.4%	12.9%	32.0%	23.2%	13.4%
Dublin City 2011	15.2%	14.5%	37.2%	20.5%	12.6%
Dublin City 2016	15.0%	13.2%	37.4%	21.3%	13.0%
Dublin City 2022	14.9%	12.9%	36.5%	22.3%	13.4%
Fingal 2011	24.2%	24.2%	24.2%	24.2%	24.2%
Fingal 2016	20.4%	20.4%	20.4%	20.4%	20.4%
Fingal 2022	22.4%	22.4%	22.4%	22.4%	22.4%
Balbriggan LEA 2011	27.9%	11.0%	34.9%	19.3%	6.9%
Balbriggan LEA 2016	27.6%	11.3%	31.3%	21.3%	8.5%

Balbriggan LEA 2022	23.8%	13.7%	26.7%	25.0%	10.8%
Balbriggan Rural ED 2011	32.8%	32.8%	32.8%	32.8%	32.8%
Balbriggan Rural ED 2016	32.7%	32.7%	32.7%	32.7%	32.7%
Balbriggan Rural ED 2022	22.4%	22.4%	22.4%	22.4%	22.4%

Source: Census of Population 2011, 2016 and 2022

The table indicates that the highest percentage of population in the study area relates to the working age group (25-44). It is considered that the available working population in the immediate vicinity of the proposed development will enhance the attractiveness of investors to locate in this area to benefit from the significant available work force. In addition, the following statistics further indicate the appropriateness of the proposed office development in relation to the highly skilled and educated work force in the surrounding area.

3.3.3.3 Social Class

The Census of Population determines social class by the nature of employment and is therefore useful as a guide to the principal types of occupation in which the population is employed or in which the population is capable of being employed. Table 3.4 overleaf shows the number and percentage of people in each of the 11 socio-economic groups identified in the 2022 Census of Population.

Table 3.3: Persons by Socio-Economic Group, 2022

Socio-Economic Group	State	Dublin County	Fingal	Balbriggan LEA	Balbriggan Rural ED
A Employers and managers	719,767 (14.3%)	235,275 (16.6%)	58,905 (18.1%)	6,234 (15.4%)	2,386 (12.3%)
B Higher professional	80,177 (1.6%)	27,495 (1.9%)	5,005 (1.5%)	471 (1.2%)	98 (0.5%)
C Lower professional	340,752 (6.8%)	122,457 (8.7%)	24,024 (7.4%)	2,375 (5.9%)	826 (4.3%)
D Non-manual	1,737,255 (34.4%)	532,580 (37.6%)	126,403 (38.8%)	15,852 (39.2%)	7,588 (39.3%)
E Manual skilled	459,800 (9.1%)	96,979 (6.9%)	24,679 (7.6%)	3,472 (8.6%)	1,743 (9.0%)
F Semi-skilled	399,627 (7.9%)	87,628 (6.2%)	21,281 (6.5%)	3,495 (8.6%)	2,004 (10.4%)
G Unskilled	156,548 (3.1%)	39,113 (2.8%)	8,016 (2.5%)	1,187 (2.9%)	657 (3.4%)
H Own account workers	214,046 (4.2%)	51,867 (3.7%)	14,272 (4.4%)	1,565 (3.9%)	775 (4.0%)
I Farmers	158,622 (3.1%)	1,880 (0.1%)	1,324 (0.4%)	188 (0.5%)	69 (0.4%)
J Agricultural workers	58,565 (1.2%)	2,845 (0.2%)	1,371 (0.4%)	275 (0.7%)	104 (0.5%)
Z All others gainfully occupied and unknown	721,522 (14.3%)	216,923 (15.3%)	40,362 (12.4%)	5,353 (13.2%)	3,071 (15.9%)
Totals	5,046,681	1,415,042	325,642	40,467	19,321

Source: Census of Population 2022

Table 3.4 indicates that the wider study area of Balbriggan LEA is predominantly in tune with the norms of Fingal, County Dublin, and the State, the electoral division of Balbriggan Rural shows some divergent results in relation to more professional occupations and skill-levels. The Balbriggan Rural ED indicates a lower percentage of people in higher skilled and professional socio-economic groups such as 'Employers

and managers', 'higher professionals' and 'lower professionals', while the ED also sees higher percentages of people in unskilled or partially skilled professions.

3.3.3.4 Educational Attainment

Advancing from second level education to third level assists the ability of the population to gain access to employment and enter the labour market for higher earnings. Table 3.5 overleaf contains CSO data from 2022 relating to the educational attainment of people at national, regional, county, city and local level.

Table 3.4: Persons by Educational Attainment, 2016

Education	State	Dublin County	Fingal	Balbriggan LEA	Balbriggan Rural ED
No Formal Education	81,280 (2.4%)	18,836 (2%)	3,368 (1.7%)	517 (2.2%)	222 (2.2%)
Primary Education	251,219 (7.4%)	61,625 (6.5%)	9,576 (4.7%)	1,299 (5.4%)	445 (4.4%)
Lower Secondary	446,007 (13.2%)	99,180 (10.4%)	20,784 (10.3%)	2,847 (11.9%)	1,227 (12.2%)
Upper Secondary	613,478 (18.1%)	154,071 (16.1%)	38,007 (18.8%)	4,873 (20.4%)	2,112 (20.9%)
Technical or Vocational qualification	253,892 (7.5%)	61,361 (6.4%)	15,339 (7.6%)	2,013 (8.4%)	1,045 (10.4%)
Advanced Cert. / Completed Apprenticeship	190,268 (5.6%)	40,157 (4.2%)	10,678 (5.3%)	1,430 (6.0%)	626 (6.2%)
Higher Certificate	187,488 (5.5%)	46,609 (4.9%)	11,823 (5.8%)	1,458 (6.1%)	680 (6.7%)
Ordinary Bachelor Degree or National Diploma	272,535 (8.1%)	78,494 (8.2%)	18,726 (9.2%)	2,194 (9.2%)	922 (9.1%)
Honours Bachelor Degree, and/or Professional Qualification	450,523 (13.3%)	149,733 (15.7%)	30,919 (15.3%)	3,177 (13.3%)	1,165 (11.6%)
Postgraduate Diploma or Degree	379,416 (11.2%)	148,720 (15.6%)	27,228 (13.4%)	2,652 (11.1%)	938 (9.3%)
Doctorate (Ph.D.) or higher	38,212 (1.1%)	15,866 (1.7%)	2,497 (1.2%)	242 (1.0%)	48 (0.5%)
Not Stated	220,311 (6.5%)	79,921 (8.4%)	13,685 (6.8%)	1,211 (5.1%)	655 (6.5%)
Totals	3,384,629	954,573	202,630	23,913	10,085

Source: Census of Population 2022

The table indicates that 11.6% of people living in the Balbriggan Rural ED have studied up to Honours Bachelor Degree / Professional Qualification level. A further 9.3% have studied to Postgraduate Diploma or Degree level, which is lower than the national averages of 13.3% and 11.2% respectively.

Predominantly, as the data in Table 3.5 illustrates, the majority of the population in the Balbriggan Rural ED chose to leave their education reasonably early with 12.2% leaving their education at lower secondary school level and a further 20.9% only attaining their education to leaving certificate level. The completion rates at lower levels of education therefore remain average to high than averages across other study areas. The incidence of 'No Formal Education' amongst the population of the Balbriggan Rural ED (2.2%) is also average when compared to that of the state, Dublin County, Fingal and wider study area of Balbriggan LEA.

Overall, Table 3.5 indicates that when compared to other areas the resident population of the wider study area and the Balbriggan Rural ED is characterised by considerably average levels of educational

attainment. This is consistent with the indicative data in Table 3.4 showing the concentration of unskilled workers in the area.

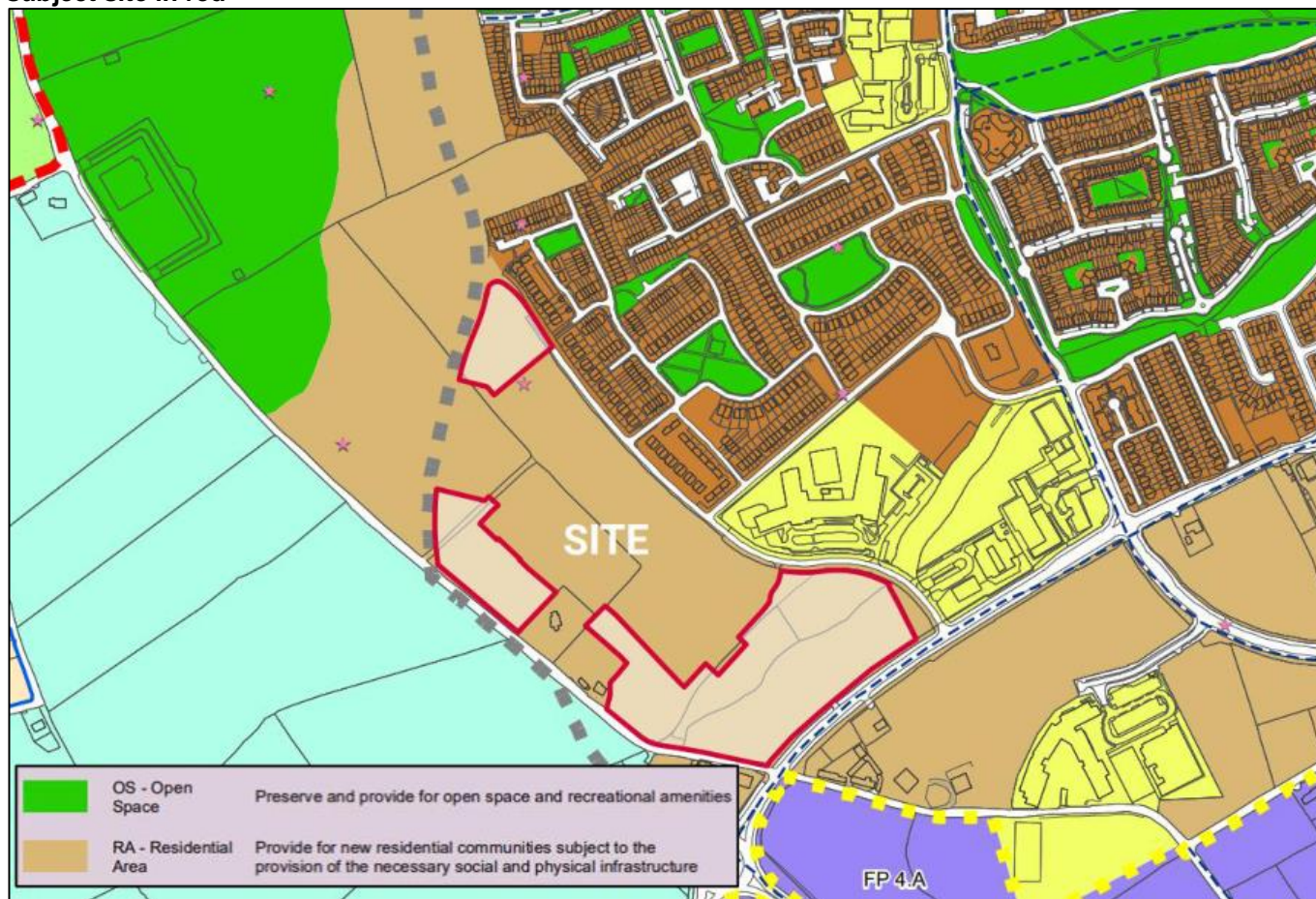
3.3.4 LAND USE & SETTLEMENT PATTERNS

The subject site consists of three separate land parcels located on a substantial greenfield site and extend to c. 7.15 ha. The predominant land use immediately surrounding the subject site are undeveloped greenfield lands to the north, west and south, with some designated for significant residential development as proposed and permitted, particularly to the north as part of the overall Ladywell/Folkstown development. To the east, a mix of residential developments, specifically at Taylor Hill, educational facilities in the form of Coláiste Ghlór na Mara, Scoil Chormaic CNS and Bremore Educate Together Secondary School, and considerable commercial and industrial development further south and south-east at Millfield Shopping Centre and Stephenstown Industrial Estate. The land use pattern of much of the wider study area is also consistently characterised by such land-uses. The site is within a 20-minute walking distance of Balbriggan town centre and its associated retail, commercial and cultural uses.

The site is located within the administrative area of Fingal County Council and is therefore subject to the land use policies and objectives of the Fingal County Development Plan 2023-2029. The lands are zoned objective 'RA – Residential Area' which seeks to *"provide for new residential communities subject to the provision of the necessary social and physical infrastructure"*.

The Planning Report and Statement of Consistency, prepared by John Spain Associates, which accompanies this application addresses the planning context issues in more detail.

Figure 3.4: Land Use Zoning Map (Fingal County Development Plan 2023-2029), with approximate outline of subject site in red



Source: Extract from Fingal County Development Plan 2023-2029

The following land uses are permissible in RA zoned areas:

*“Bed and Breakfast, Childcare Facilities, Community Facility, Education, Funeral Home/Mortuary, Guest House, Health Centre, Health Practitioner, Hospital, Office Ancillary to Permitted Use, Office ≤ 100 sqm, Office > 100 sqm and < 1,000 sqm, **Open Space**, Place of Worship, Public House, Public Transport Station, Recreational/Sports Facility, **Residential**, Residential Care Home/ Retirement Home, Restaurant/Café, Retail – Local < 150 sqm nfa, **Retail – Convenience ≤ 500 sqm nfa**, Retail – Comparison ≤ 500 sqm nfa, Retail – Supermarket ≤ 2,500 sqm nfa, Retirement Village, Sheltered Accommodation, Sustainable Energy Installation, Taxi Office, Traveller Community Accommodation, Utility Installations, Veterinary Clinic.” (our emphasis)*

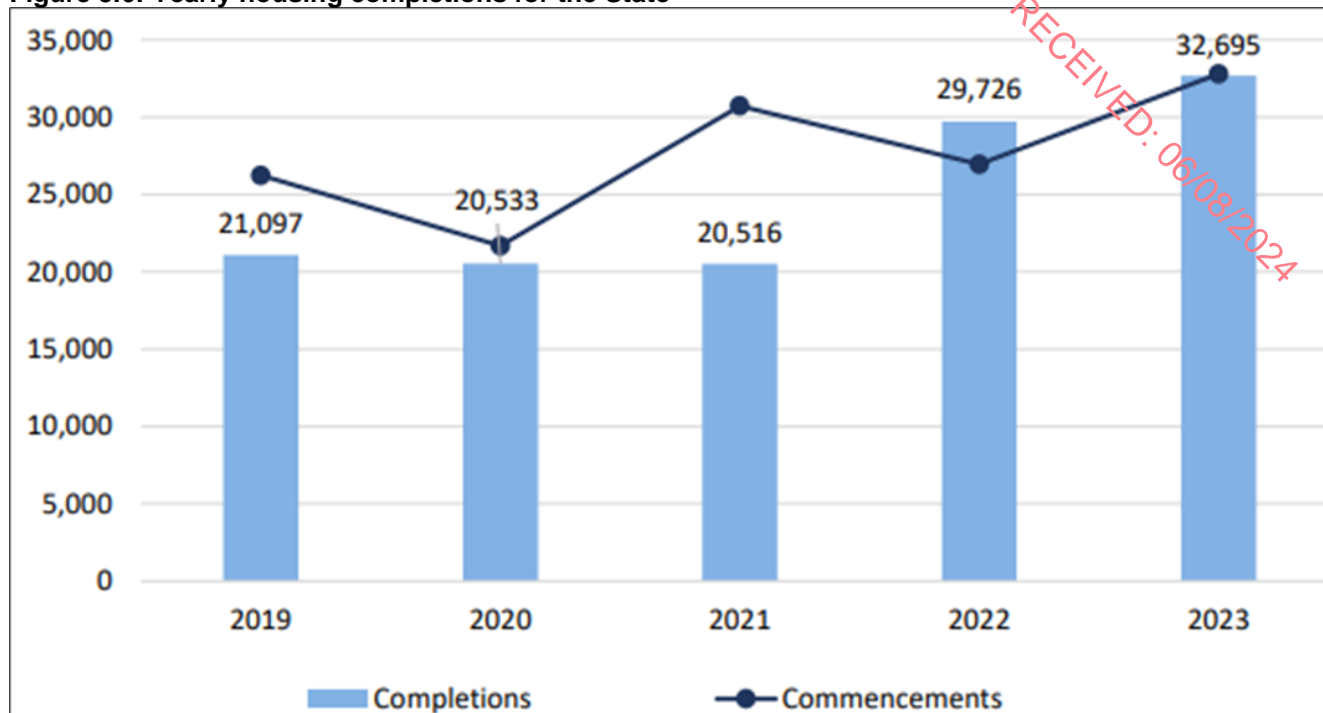
Residential, open space and convenience retail (< 500sqm net floor area) uses are noted as being permitted in principle in RA zonings.

3.3.5 HOUSING

The ‘*Housing for All*’ plan by the Irish Government and Department of Housing, Local Government and Heritage states that “*right now, Ireland’s housing system is not meeting the needs of enough of our people.*”

Over the last few years, the steady growing demand in combination with the critical undersupply of quality housing provision has led to significant problems of homelessness, unaffordability and vacancies amongst others.

There is a significant and established housing need in Dublin and the State as a whole, as recognised within Government housing and planning policy, including the 2016 Rebuilding Ireland Plan for Housing and Homelessness and Housing for All, published in September 2021, which reinforces the critical and strategic need for new dwellings where it is a target to provide 300,000 housing units by the year 2030. The government’s vision for the housing system over the longer term is to achieve a steady supply of housing in the right locations with economic, social and environmental sustainability built into the system. The proposed development will allow for a new residential community, built to a high standard and quality, adjacent to existing settlements, with a range of amenities and services provided, in close proximity to public transport services.

Figure 3.6: Yearly housing completions for the State

Source: Figure 10 ESRI Spring Commentary 2024 – Note Summer 2024 commentary annual figures not provided.

While the number of residential units being completed nationally has rebounded following the COVID-19 pandemic the level of completions remains significantly lower than the estimated equilibrium demand for housing (recently increased from 35,000 units to 50,000 units per annum by the ESRI) in the State. Moreover, the current level of housing need and demand is not at equilibrium, being significantly augmented by the low level of housing completions with 29,851 new dwellings completed in 2022 and 32,695 no. units completed in 2023.

However, from the start of 2024 there has been a notable pick-up in housing commencements. In April 2024 alone, 18,000 housing units commenced. While some of this is potentially due to changes in policy (such as the development levy and water connection waiver), this may lead to higher housing output in 2025 if commencements follow a traditional 9–18-month transition period into completions.

In terms of increasing future housing delivery, the proposed development will facilitate the construction of 197 no. dwellings in a mixture of maisonettes, apartments, duplex units and houses, 2 no. commercial/retail units, and all associated site development works on lands that have been zoned for development.

In terms of increasing future housing delivery, the proposed development is located at a location which is zoned for significant residential development, and which is appropriate for the uses proposed.

The application site is strategically located in close proximity to public transport infrastructure including numerous existing Dublin Bus routes (i.e., 33, 33A, 101, 101X, 191 and B1) and proposed BusConnects routes, the Dublin-Belfast railway line through Balbriggan train station and by a good network of cycleways and pedestrian pathways throughout. There is a significant demand and need for additional housing provision not only in the State but in the area exclusively as recognized in the Fingal County Development Plan 2023-2029, as such it is considered that the provision of a significant residential development at this location will improve the housing shortage in the surrounding area.

The overall development at Ladywell/Folkstown will also provide for a much-enhanced public realm with new through routes and pedestrian and cyclist connections.

The site is located within the administrative area of Fingal County Council and is therefore subject to the land use policies and objectives of the County Development Plan 2023-2029. The site is zoned objective 'RA – Residential Area' which seeks to "provide for new residential communities subject to the provision of the necessary social and physical infrastructure", under the Fingal County Development Plan 2023-2029.

The development of the lands surrounding the subject site has the potential to provide significant additional housing provision as part of multiple mixed-use developments to include commercial retail units, creche facilities, expansive areas of public open green space, car parking, bicycle parking and other ancillary services and amenities. It is considered that the proposed development will contribute to the national economy by enabling the activation of zoned lands for residential development in order to meet the market and social demand for high quality housing within the Dublin region, and will encourage development at a strategic location in close proximity to public transport nodes as well as local services. It will also allow for the provision of much needed housing accommodation to cater for the increasing population of homeless and disadvantaged persons in the increasingly inaccessible housing market through social and affordable housing provision within the scheme. It will therefore assist in delivering the strategic long term sustainable development objectives of both Fingal County Council, Dublin City and the Greater Dublin Area.

The National Planning Framework 2040 states:

"Carefully managing the sustainable growth of compact cities, towns and villages will add value and create more attractive places in which people can live and work. All our urban settlements contain many potential development areas, centrally located and frequently publicly owned, that are suitable and capable of re-use to provide housing, jobs, amenities and services, but which need a streamlined and co-ordinated approach to their development, with investment in enabling infrastructure and supporting amenities, to realise their potential. Activating these strategic areas and achieving effective density and consolidation rather than more sprawl or urban development, is a top priority".

There is clear support and a need for compact housing growth at well serviced urban locations through the creation of vibrant and mixed neighbourhoods and communities. Ladywell/ Folkstown, Balbriggan aims to achieve this through the development of housing with associated green spaces, retail, and new and improved pedestrian and cyclist infrastructure. The proposed development will therefore allow for the achievement of such on the subject lands through the delivery of 197 no. residential units to serve future residential communities at this location.

3.3.6 HEALTH & SAFETY

The adjoining context consists of undeveloped lands and a mix of residential, educational, open amenity spaces and commercial development. It does not include any significant man-made industrial processes (including SEVESO II Directive sites (96/82/EC & 2003/105/EC) which would be likely to result in a risk to human health and safety.

3.4 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 proposed environment that could arise. For this chapter the potential impact on Populations and Human Health is discussed.

A full description of the proposed development is provided in Section 2 of this EIAR document.

3.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

3.5.1 INTRODUCTION

This section provides a description of the specific, direct and indirect, impacts that the proposed development may have during both the construction and operational phases of the proposed development. As stated, guidance documents from the EPA and the Department outline that the assessment of impacts on population and human health should focus on health issues and environmental hazards arising from the other environmental factors and does not require a wider consideration of human health effects which do not relate to the factors identified in the EIA Directive. Additionally, this section addresses the socio-economic and employment impacts of the proposed development.

The specific chapters of the EIAR (4-16) assess the environmental topics outlined in the EIA Directive.

3.5.2 WATER

3.5.2.1 Construction Phase

Provision of water infrastructure for the proposed development would involve construction activities within the subject lands mainly involving trench excavations conducted in parallel with the other services. The potential impact on the local public water supply network would be short term and imperceptible. Therefore, the impact on human health and population in this regard is considered to be not significant.

During the course of the construction phase of the proposed development, there is potential, in the absence of mitigation, for surface water runoff to suffer from increased levels of silt or other pollutants, in addition to potential pollution from spillages, wheel washing and water from trucks on site. The Construction and Environmental Management Plan (contained in Appendix D of Volume III of the EIAR, and the Resource and Waste Management Plan included with the application, set out how all materials will be managed, stored and disposed of in an appropriate manner, mitigating the potential negative effects as outlined.

Potential impact on water is addressed in Chapter 6 (Water and Hydrology) and a number of mitigation measures are outlined in that chapter of this Environmental Impact Assessment Report. These mitigation measures will serve to minimise potential adverse impacts of the construction phase to the water environment, thereby minimising any associated risk to human health from water contamination. Therefore, the impact of construction of the proposed development in relation to water is likely to be short-term and imperceptible with respect to human health.

3.5.2.2 Operational Phase

All new foul drainage lines will be constructed in accordance with Irish Water Standards. Foul sewers will be pressure tested and will be subject to a CCTV survey in order to identify any possible defects prior to being made operational. The design of proposed site levels (roads, parking bays, swales etc.) has been carried out in such a way as to replicate existing surface gradients where possible, therefore replicating existing overland flow paths, and not concentrating additional surface water flow in a particular location.

Surface water runoff from the site will be attenuated to the greenfield runoff rate as set out in the Paul McGrail Engineering Services Report, included in the LRD application with detail also contained in Chapter 2 of the EIAR.

SuDS features such as swales and filter drains to provide additional storage and promote infiltration of and treatment of surface water run-off have been provided in landscaped areas.

All new surface water drainage on site will be pressure tested and will have a CCTV survey carried out prior to being made operational. The site is attenuated to mimic the greenfield scenario as part of the overall Ladywell/Folkstown lands.

3.5.3 NOISE AND VIBRATION

3.5.3.1 Construction Phase

Noise and Vibration are addressed in Chapter 8 (Noise and Vibration) which was prepared by AWN Consulting.

During the construction phase there will be extensive site works, involving construction machinery, construction activities on site, and construction traffic, which will all generate noise. The highest noise levels will be generated during the general construction activities and during rock excavation. The construction noise levels will only occur during daytime hours which will serve to minimise the noise impacts at local existing receptors over the course of the construction phase.

Chapter 8 of this EIAR sets out mitigation measures in relation to noise.

Any construction activities undertaken on the site will be required to operate below the recommended vibration criteria set out in Chapter 9. Following the implementation of mitigation and based on the standards which will be maintained, Chapter 9 predicts that vibration impacts during the construction stage will be negative, not significant, and temporary.

3.5.3.2 Operational Phase

Once operational, if building services plant items are required to serve the development, the cumulative operational noise level at the nearest noise sensitive location surrounding the development (e.g. residential dwellings etc.) will be designed/attenuated to meet the relevant BS 4142 noise criteria for day and night-time periods.

The residual construction noise impact will be negative, temporary to short-term and moderate to significant.

3.5.4 AIR QUALITY & CLIMATE

3.5.4.1 Construction Phase

During the construction phase, site clearance and ground excavation works have the potential to generate dust emissions rising from the operation and movement of machinery on site. This could have a potential impact on population and human health.

Various elements associated with the construction phase of the proposed development have the potential to impact local ambient air quality, human health and climate. However, the potential construction phase impacts shall be mitigated as detailed above to ensure there is no adverse impact on ambient air quality for the duration of all construction phase works. It is predicted that the construction phase of the development will not generate air emissions that would have an adverse impact on local ambient air quality or on local human health or on the local micro-climate or the wider macro-climate.

The predicted construction phase residual impacts on air quality will be negative, slight and short-term.

The predicted residual operational phase impacts on air quality and climate will be negative, imperceptible and long-term.

3.5.4.2 Operational Phase

The operational phase of the proposed development will result in a slight impact on local air quality primarily as a result of the increased traffic movements associated with the development.

It is predicted that the operational phase of the development will not generate air emissions that would have an adverse impact on local ambient air quality or local human health, as stated in Chapter 7 and 8 – Air Quality and Climate.

3.5.5 LANDSCAPE & VISUAL IMPACT

3.5.5.1 Construction Phase

The construction phase will have short term landscape and visual impacts. The impacts are not considered significant on population and human health.

3.5.5.2 Operational Phase

The operational phase will result in landscape and visual impacts, as set out in Volume II of this EIAR. The impacts are not considered significant on population and human health.

3.5.6 ECONOMIC ACTIVITY

3.5.6.1 Construction Phase

The construction phase of the proposed development is likely to result in a positive net improvement in economic activity in the area of the proposed development site, particularly in the construction sector and in associated and secondary building services industries. The sector has grown strongly in recent years and this development will help to further enhance growth and reduce the increasing pressure on the housing market into the future post-construction of the proposed development. This development will help to sustain and promote employment and short term slight positive impacts.

It is further noted that due to the scale and extent of the overall Ladywell/Folkstown landbank that it is likely that construction teams will carry on from phase to phase creating sustainable employment over the medium term.

The construction of the development and all associated infrastructure will precipitate a short term slight positive impact on construction-related employment for the duration of the construction phase. The phased construction of the proposed residential units, neighbourhood centre, childcare facility alongside associated physical infrastructure will result in a construction period of up to 48 months and will consequently enhance economic activity during this period, which is considered to be a slight temporary positive impact. A considerable amount of the work will be undertaken by sub-contractors who will also work elsewhere on a phased basis over the construction phase.

The construction phase will also have secondary and indirect ‘spin-off’ impacts on ancillary support services in the wider area of the site, such as retail services, together with wider benefits in the aggregate extraction (quarry) sector, building supply services, professional and technical professions etc. These benefits will be largely temporary but will contribute to the overall future viability of the construction sector and related services and professions over the phased construction period.

3.5.6.2 Operational Phase

The operational phase of the proposed development will result in the provision of 197 no. residential dwellings, a commercial retail unit and open spaces to serve the southern portions of the overall Ladywell/Folkstown lands. Based on the mix and potential occupancy the proposal could potentially result in a population of c. 565 when fully built and occupied (based on 1.5 persons per 1-bedroom unit, 2.5 persons per 2-bedroom unit and 3.5 persons per 3-bedroom unit +). This increase in occupancy in the area will enhance local spending power and will assist with the delivery of a critical mass of population which will support a wide range of additional local businesses, services, transport infrastructure and employment opportunities, which will accrue as the development of the Planning Scheme progresses. The proposal will provide much needed residential accommodation and accords with National Policy on delivering Sustainable Residential Communities and is considered a positive permanent slight impact.

With reference to employment during the operational phase, it is estimated that the proposed commercial unit development could generate between c. 18 and 23 no. Full Time Equivalent positions⁹.

3.5.7 SOCIAL PATTERNS

3.5.7.1 Construction Phase

The construction phase of the proposed development is unlikely to have any significant impact on social patterns within the surrounding area. Some temporary additional local populations may arise out of construction activity. However, these impacts are imperceptible, temporary in nature and therefore not considered significant.

It is acknowledged that the construction phase of the project may have some short-term negative impacts on local businesses and residents. Such impacts are likely to be associated with construction traffic and possible nuisances associated with construction access requirements. These impacts are dealt with separately and assessed elsewhere in the EIAR, including Chapter 2 - Project Description and Alternatives Examined, Chapter 10 - Air Quality and Climate and Chapter 11 - Noise and Vibration. Any disturbance is predicted to be commensurate with the normal disturbance associated with the construction industry where a site is efficiently and properly managed having regard to neighbouring activities. The construction methods employed, and the hours of construction proposed will be designed to minimise potential impacts to nearby residents. A Construction Environmental Management Plan (prepared by Paul McGrail Consulting Engineers) has been prepared and is submitted with this planning application. The mitigation contained in Chapter 17 of this EIAR and the CEMP (in Appendix D of Volume III of the EIAR) will be contained in the contractor's CEMP.

3.5.7.2 Operational Phase

Once operational, the proposed development will enable the delivery of much needed additional residential accommodation across the surrounding lands. The addition of new roads and trunk infrastructure to the area will also improve the available vehicular and pedestrian access in the area through the creation of new linkages between the existing road network and the establishment of new pedestrian pathways and cycle lanes which help to support and encourage the usage of more active travel modes through the area, which will also have significant social benefits to future communities in the area through the appropriate provision of high-quality public transport connections. In all, the proposed development will enhance the vibrancy and vitality of the area and will help to support existing community and social infrastructure. This is an imperceptible positive long-term impact.

3.5.8 LAND-USE & SETTLEMENT PATTERNS

3.5.8.1 Construction Phase

⁹ Employment Densities Guide 3rd Edition

The construction phase of the proposed development will primarily consist of site clearing, excavation and construction works, and the laying of the proposed roads and trunk infrastructure on site and has the potential to impact adversely and result in the temporary degradation of the local visual environment on a short-term basis. The visual impacts precipitated by the proposed development are assessed in greater detail in Chapter 10 of the EIAR 'Landscape and Visual Impacts'.

Secondary land use impacts include off-site quarry activity and appropriate disposal sites for removed spoil and other materials transported off site. Chapter 13 Material Assets Waste considers these potential impacts in more detail and Chapter 13 (as well as the Construction and Demolition Waste Management Plan) describes the relevant mitigation measures).

The phase may result in a marginally increased population in the wider area due to increased construction employment in the area, however, this would be temporary in nature and the impact would be imperceptible.

3.5.8.2 Operational Phase

The operational phase of the proposed development will result in the introduction of 197 no. residential dwellings, a commercial retail unit and open spaces to serve the southern portions of the overall Ladywell/Folkstown lands, delivering wider public realm improvements, in accordance with national and local planning policy objectives. The proposed development will accommodate an adequate provision of high-quality housing to serve the existing and future population of the county and the wider Greater Dublin Area. This is an important contributor to the establishment and maintenance of good human / public health. The high-quality design of the proposed development will contribute to a positive impact on the wellbeing of future residents.

3.5.9 HOUSING

3.5.9.1 Construction Phase

The proposed development will not result in any impact in terms of loss of housing stock during the construction stage.

3.5.9.2 Operational Phase

The operational phase of the proposed development will result in the provision of 197 no. residential dwellings, a commercial retail unit and open spaces to serve the southern portions of the overall Ladywell/Folkstown lands. In this respect, the proposed development will accommodate an additional population of approximately 565 no. people.

The proposed development will therefore, in time, respond to established housing need and demand in the area of the subject lands, and the wider region. The future residential units at this location will assist in addressing the significant shortfall of residential development.

The surrounding Ladywell lands will deliver a range of housing unit sizes and types and will incorporate a high level of good quality public open space through the provision of a new large, green public urban parks.

The delivery of significant, well-designed and high-quality residential developments at an appropriate location close to public transport links will have a direct, positive, and significant impact on the future residents of the Ladywell, Balbriggan lands and will support the population growth targeted for the Fingal area and Dublin City.

3.5.10 EMPLOYMENT

The impact of the proposed development in relation to employment has been discussed under economic activity.

3.5.11 HEALTH & SAFETY

The surrounding context consists of a mix of residential, educational and commercial lands. It does not include any man-made industrial processes (including SEVESO II Directive sites (96/82/EC & 2003/105/EC) which might result in a risk to human health and safety. It is not within the consultation zone of a SEVESO Site as defined by the Health and Safety Authority. Chapter 14 – Risk Management addresses the potential health and safety aspects of the proposed development during the construction and operational phases.

In the absence of mitigation, the proposed development could have a slight negative, short-term impact on the surrounding area during construction phase due to traffic and associated nuisance, dust and noise. These issues and appropriate mitigation measures are addressed in Chapters 7, 8 and 12 of the EIAR, in the Traffic and Transportation Assessment, Construction Management Plan and the Waste Management Plan which accompany the application. The Traffic and Transportation Chapter recommends that a Construction Traffic Management Plan be implemented for the site which will minimise disruption to the surrounding road network, which will be submitted and agreed with the Planning Authority.

No significant health and safety effects are envisaged during either the construction or operational phases of the proposed development. The standard Health and Safety policy, procedures and work practices of the proposed development will conform to all relevant health and safety legislation both during the construction and operational stages of the proposed development. The proposed development will be designed and constructed to best industry standards, with an emphasis being placed on the health and safety of employees, local residents and the community at large.

3.5.11.1 Construction Phase

The construction methods employed and the hours of work proposed will be designed to minimise potential impacts. The development will comply with all Health & Safety Regulations during the construction of the project. Where possible, potential risks will be omitted from the design so that the impact on the construction phase will be reduced. A Construction Environmental Management Plan has been prepared by Paul McGrail Consulting Engineers and the measures specified therein will be complied with during the construction phase of the project.

3.5.11.2 Operational Phase

The operational stage of the development will not precipitate long term negative impacts in terms of health and safety. The design of the proposed development has been formulated to provide for a safe environment for future residents and visitors alike. The proposed development in its entirety has been designed in accordance with best practice and the applicable guidelines including DMURS, to ensure the development promotes a high standard of health and safety for all occupants and visitors.

The Air Quality Chapter (Ch 7) of the EIAR predicts that the operational phase of the development will not generate air emissions that would have an adverse impact on local ambient air quality or local human health and that there will be a negligible impact on local air quality generated by increased traffic movements associated with the development.

The proposed development will not cause significant impacts on human health and safety once completed and operational, and any impact will be imperceptible, and unlikely.

3.5.12 RISK OF MAJOR ACCIDENTS OR DISASTERS

Chapter 14 – Risk Management addresses the potential risks of major accidents or disasters relating to the proposed development during the construction and operational phases.

3.5.13 CONSTRUCTION PHASE

The location of the proposed development is within Flood Zone C and it is unlikely there will be any impacts related to a major accident or disaster during the construction phase of the proposed development, stemming internally from within the development, or externally.

The works proposed in proximity to roadways will be governed by best practice and appropriate safety procedures, ameliorating any risk of a major accident in those contexts.

3.5.14 OPERATIONAL STAGE

The proposed development will be located on land which is not at any significant risk of flooding. The Eastern CFRAM (Catchment Flood Risk Assessment and Management) study details the predicted risk for a variety of fluvial and coastal flood scenarios. The proposed development is therefore outside of the Q100 and Q1000 flood extents and is therefore in within Flood Zone C (low risk of flooding). The proposed development is appropriate for the application site's flood zone categories and that the proposed development is considered to have the required level of flood protection.

Therefore, it is considered that there is no likely significant risk related to major accidents or disasters, external or internal, man-made or natural in respect of the proposed development.

3.6 POTENTIAL CUMULATIVE IMPACTS

The potential cumulative impacts of the proposed development on population and human health have been considered in conjunction with the ongoing changes in the surrounding area. Visits to the subject site and surrounding area and desk-based review of online planning files have been undertaken to identify the existing pattern of development, nearby uses, and any permitted / ongoing developments of relevance to the current proposals in the context of population and human health. The surrounding area is defined by a broad and varied mix of uses, including residential, commercial, recreational and civic uses.

The lands on which the proposed development is to take place are predominantly zoned to “provide for new residential communities subject to the provision of the necessary social and physical infrastructure”, under the Fingal County Development Plan 2023-2029. This zoning will see more development to the surrounding the subject lands. The proposed development serves as Phase 4 of the overall development scheme at the Ladywell/ Folkstown landbank with previous applications for Phase 1 (FCC Reg. Refs. F17A/0374, F15A/0437, F13A/0240), Phase 2 (FCC Reg. Refs. F15A/0550, F10A/0263, F17A/0372/ABP-PL06F.249267, F18A/0266, F19A/0001, F19A/0377), Phase 3A (FCC Reg. Ref. F21A/0055 / ABP-312048-21), Phase 3B (FCC Reg. Ref. F22A/0526) and Phase 3C (FCC Reg. Ref. F22A/0670) all been granted permission. In addition, other local residential development schemes in the area include lands off Flemington Lane to the north, which although has been refused planning permission by Fingal County Council (FCC Reg. Ref. LRD0006/S3), is currently at appeal with An Bord Pleanála (ABP Reg. Ref. 319343) and awaiting a decision.

Based on the mix and potential occupancy the combined Phase 3 and Phase 4 development at Ladywell/ Folkstown could potentially result in a population of c. 1,288 when fully built and occupied (based on 1.5 persons per 1-bedroom unit, 2.5 persons per 2-bedroom unit and 3.5 persons per 3-bedroom unit +).

The development of the wider Ladywell scheme will influence demographic change, population growth, and the intensity of commercial use in this area, cumulatively contributing to increasing population and employment growth in the wider area into the future which represents a positive cumulative impact which accords with the planning policy context for the area.

An increase in local housing, and some increase in employment opportunities and service provision (i.e. crèches, retail and employment) has the potential to generate direct, indirect impacts. The visual appearance of the landscape will be altered with the introduction of the proposed built elements including infrastructure, in cumulation with other development in the area. Implementation of the remedial and reductive measures in respect of noise/traffic management etc. in the EIAR would ensure a minimal impact on the existing communities of this area during the construction phase.

The cumulative impact of the proposed development, along with other permitted and existing developments in the vicinity, will be a further increase in the population of the wider area. This will have a moderate positive long-term impact on the population in the immediate area of Ladywell/ Folkstown, and a slight positive long-term impact in the wider area of Balbriggan.

Chapter 7 (Air Quality) states that the operational phases of the subject development and other permitted residential developments in the local area will not generate cumulative air emissions that will have an adverse impact on local ambient air quality. Measured baseline air quality and national published air quality data confirm that the existing air quality is good and that the operational phases of the subject development and other local proposed developments will have a long-term imperceptible impact on existing air quality.

Chapter 8 (Noise and Vibration) states that once the subject development is completed and if the lands to the north are developed there will be no residual adverse noise impact on the receiving environment associated with their operation. Increased traffic movements associated with both developments will generate a long-term not significant impact on the local noise climate during peak hour times.

The overall cumulative impact of the proposed development will therefore be long term and positive as residents will benefit from a high quality, visually attractive living environment, with strong links and pedestrian permeability. Having regard to the assessment of cumulative impacts, it is not considered that any additional mitigation measures are required further to those which are outlined above.

3.7 'DO NOTHING' IMPACT

In order to provide a qualitative and equitable assessment of the proposed development, this section considers the proposed development in the context of the likely impacts upon the receiving environment should the proposed development not take place.

A 'do nothing' scenario would result in the subject lands remaining fallow and undeveloped. This would be an underutilisation of the subject site from a sustainable planning and development perspective.

In the do-nothing scenario, the absence of the proposed development would perpetuate the housing shortfall in the Dublin area, contrary to the aims and objectives of national, regional, and local planning and housing policy, all of which promote the delivery of additional housing at strategic locations such as the subject site.

The local economy would not experience the direct and indirect positive effects of the construction phase of development, including employment creation. The local construction sector and associated industries and services would be less viable than they might otherwise be.

The 'do-nothing' scenario would result in the status of the environmental receptors described throughout this EIAR document remaining unchanged. The potential for any likely and significant adverse environmental impacts arising from both the construction and operational phases of the proposed development would not arise. In terms of the likely evolution without implementation of the project as regards natural changes from the baseline scenario, it is considered there would be limited neutral change from the baseline scenario in relation to population (human beings) and human health.

3.8 AVOIDANCE, REMEDIAL & MITIGATION MEASURES

Avoidance, remedial and mitigation measures describe any corrective or mitigative measures that are either practicable or reasonable, having regard to the potential likely and significant environmental impacts.

3.8.1 CONSTRUCTION PHASE

A range of construction related remedial and mitigation measures are proposed throughout this EIAR document with reference to the various environmental topics examined and the inter-relationships between each topic. These remedial and mitigation measures are likely to result in any significant and likely adverse environmental impacts on population and human health during the construction phases being avoided. Readers are directed to Chapter 16 of this EIAR document which summarises all of the remedial and mitigation measures proposed as a result of this EIAR.

In order to protect the amenities enjoyed by nearby residents, premises and employees a Construction Environment Management Plan will be submitted by the contractor and implemented during the construction phase. The content of the CEMP will be based on the mitigation set out in this EIAR.

With reference to the construction phase of the proposed development, the objectives of the Resource and Waste Management Plan and Operational Waste Management Plan, both prepared by AWN Consulting (and also Chapter 11 of the EIAR) is to ensure that waste generated during the proposed construction and operation phases will be managed and disposed of in a way that ensures the provisions of the Waste Management Acts 1996 - 2013 are complied with.

3.8.2 OPERATIONAL PHASE

The operational phase will enable the delivery of much needed additional residential accommodation across the surrounding lands. The addition of new roads and trunk infrastructure to the area will also improve the available vehicular and pedestrian access in the area through the creation of new linkages between the existing road network and the establishment of new pedestrian pathways and cycle lanes which help to support and encourage the usage of more active travel modes through the area, which will also have significant social benefits to future communities in the area through the appropriate provision of high-quality public transport connections.

During the operational phase of the development the design of the entire scheme has had regard to Design Manual for Urban Roads and Streets (DMURS) during its design. This will promote a pedestrian friendly environment, promoting sustainable development and reducing the influence of cars. This has the potential to reduce accidents within the proposed development.

For the operational phase, no further specific mitigation is required having regard to the mitigation included within the other chapters of this EIAR.

3.9 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

This section provides a qualitative description of the resultant specific direct, indirect, secondary, cumulative, short, medium and long-term permanent, temporary, positive and negative effects as well as impact interactions which the proposed development may have, assuming all mitigation measures are fully and successfully applied. It should be noted that in addition to remedial and mitigation measures, impact avoidance measures have also been built into the EIAR and project design processes through the assessment of alternatives described in Chapter 2 of this EIAR document. Impact interactions are considered further in Chapter 15.

There are numerous inter-related environmental topics described throughout this EIAR document which are also of relevance to Population and Human Health. For detailed reference to the residual impacts of

particular environmental topics please refer to the relevant corresponding chapter of the EIAR (land and soils, water and hydrology, air quality and climate, noise and vibration, traffic, and risk management).

3.9.1 CONSTRUCTION PHASE

The construction phase of the proposed development will primarily consist of site clearance, excavation and construction works, which will be largely confined to the proposed development site (including haul routes). Notwithstanding the implementation of remedial and mitigation measures there will be some minor temporary residual impacts on population (human beings) and human health most likely with respect to nuisance caused by construction activities, predominantly related to noise and traffic as detailed in chapters 9 and 11.

It is anticipated that subject to the careful implementation of the remedial and mitigation measures proposed throughout this EIAR document, and as controlled through the Construction and Environmental Management Plan any adverse likely and significant environmental impacts will be avoided. The overall predicted likely impact of the construction phase will be short-term not significant, and neutral. A CEMP (with the mitigation contained in this EIAR) will be developed by the contractor and submitted to the Local Authority.

Imperceptible, positive short-term impacts are likely to arise due to an increase in employment and economic activity associated with the construction of the proposed development.

3.9.2 OPERATIONAL PHASE

The proposed development will result in a generally positive alteration to the existing undeveloped site in terms of the provision of new roads and trunk infrastructure to serve the growing residential and working population of the area in accordance with the objectives of the Fingal County Council Development Plan. Positive impacts on population and human health will include health benefits associated with the provision of a significant quantity of open space, pedestrian and cyclist/green routes, a highly permeable layout which will connect to the adjacent existing road network.

The implementation of the range of remedial and mitigation measures included throughout this EIAR document is likely to have the impact of limiting any adverse significant and likely environmental impacts of the operational phase of the proposed development on population and human health (as set out in relevant chapters land and soils, water and hydrology, air quality and climate, noise and vibration, traffic, and risk management).

This chapter of the EIAR has provided an assessment of the likely impact of the proposed development on population and human health. As set out above, the proposed development will result in a long-term positive indirect impact on housing and is not likely to result in any significant negative effects on population and human health, and will result in some other positive impacts, including travel patterns of a sustainable and appropriate capacity through increased access and permeability.

3.9.3 CUMULATIVE

The cumulative impact of the proposed development, along with other permitted and existing developments in the vicinity, will be a further increase in the population of the wider area into the future. This will have a moderate positive long-term impact on the population in the immediate area of Ladywell/Folkstown and a slight positive long-term impact in the wider area of Balbriggan.

Chapter 7 (Air Quality) states that the operational phases of the subject development and other permitted residential developments in the local area will not generate cumulative air emissions that will have an adverse impact on local ambient air quality. Measured baseline air quality and National published air quality data confirm that the existing air quality is good and that the operational phases of the subject

development and other local proposed developments will have a long-term imperceptible impact on existing air quality.

Based on the mix and potential occupancy the combined Phase 3 and Phase 4 development at Ladywell/Folkstown could potentially result in a population of c. 1,288 when fully built and occupied (based on 1.5 persons per 1-bedroom unit, 2.5 persons per 2-bedroom unit and 3.5 persons per 3-bedroom unit +).

Chapter 8 (Noise and Vibration) states that the cumulative noise and vibration impacts associated with the proposed development and future local developments will not result in an increased impact on the closest receptors to the proposed development site.

There is a possibility that multiple developments in the area could run concurrently or overlap in the construction phase and contribute to additional impacts in terms of traffic, dust and noise. However, the mitigation measures highlighted above and included in the individual chapters of this EIAR, along with the fact that any other significant construction project in the area would also likely require an EIAR and inclusion of mitigation measures to reduce the cumulative impacts to sensitive receptors in the area. The construction phase of the proposed development together with any relevant other planned or permitted developments would have a positive impact in terms of employment. Contractors for the proposed development would be required to operate in compliance with a project-specific CMP and CTMP, which will include mitigation measures outlined in this EIAR. It is considered that there would be no cumulative effects on human health. The mitigation contained in Chapter 16 of this EIAR and CMP will be contained in the contractor's CEMP.

3.9.4 'WORST-CASE' SCENARIO

The failure of the proposed development to proceed will mean that the proposed new residential accommodation would not be constructed resulting in the failure to realise the development potential of the surrounding landholdings in terms of delivering new housing or local employment. However, failure of the proposed development to proceed or failure of any proposed mitigation measures, will not lead to any profound, irreversible or life-threatening consequences. In these circumstances no further consideration of this scenario is necessary in respect of health, community, employment or population issues.

3.10 MONITORING

In relation to the impact of the development on population and human health it is considered that the monitoring measures outlined in this EIAR with regard to the other environmental topics such as water, air quality and climate and noise and vibration sufficiently address monitoring requirements.

3.11 REINSTATEMENT

While not applicable to every aspect of the environment considered within the EIAR, certain measures may be proposed to ensure that in the event of the proposal being discontinued, there will be minimal impact to the environment.

There are no reinstatement works proposed specifically with respect to population and human health.

3.12 DIFFICULTIES ENCOUNTERED IN COMPILING

No significant particular difficulties were experienced in compiling this chapter of this EIAR document.

4.0 BIODIVERSITY

4.1 INTRODUCTION

This chapter of the environmental report has been prepared by Padraic Fogarty of OPENFIELD Ecological Services. Pádraic Fogarty has worked for over 20 years in the environmental field and in 2007 was awarded an MSc from Sligo Institute of Technology for research into Ecological Impact Assessment (EclA) in Ireland. OPENFIELD is a full member of the Institute of Environmental Management and Assessment (IEMA).

This section of the EIAR provides the for an ecological assessment of the proposed development and its potential impacts to biodiversity, which will be completed in full in the EIAR to be submitted with the application.

Under Article 6(3) of the Habitats Directive a screening for ‘appropriate assessment’ of projects must be carried out to determine if significant effects are likely to arise to Natura 2000 sites. This assessment is carried out by the competent authority, in this case Fingal County Council. The AA Screening report is presented separately (along with a NIS).

4.2 STUDY METHODOLOGY

The assessment was carried out in accordance with the following best practice methodology: ‘*Guidelines on the information to be contained in Environmental Impact Assessment Reports*’ by the Environmental Protection Agency (EPA, 2022) and ‘*Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland*’ by the Chartered Institute of Ecology and Environmental Management (IEEM, 2016).

The development site was surveyed for previous studies in relation to development applications on the 6th of June 2019, the 21st of January 2020, the 13th of January 2021, the 26th of July 2022 and May 8th and 29th 2023. Specifically for this LRD application, the development site was surveyed on January 8th, February 14th, March 15th and April 29th, 2024. The site was surveyed in accordance with the Heritage Council’s Best Practice Guidance for Habitat Survey and Mapping (Smith et al., 2010). Habitats were identified in accordance with Fossitt’s Guide to Habitats in Ireland (Fossitt, 2000). It is noted that this LRD application overlaps in part with the previous phases of development in Phase 3 which were surveyed previously.

The nomenclature for vascular plants is taken from The New Flora of the British Isles (Stace, 2010) and for mosses and liverworts - A Checklist and Census Catalogue of British and Irish Bryophytes (Hill et al., 2009).

April, May, June and July lie within the optimal period for general habitat surveys and so it was possible to classify all habitats on the site to Fossitt level 3 (Smith et al., 2010). March, April, June and July are also within the optimal season for surveys for breeding birds. January, February and March are within the optimal period for surveying large mammals, particularly Badgers, as well as wintering birds.

4.3 RECEIVING ENVIRONMENT (BASELINE SCENARIO)

4.3.1 ZONE OF INFLUENCE

There are a number of designations for nature conservation in Ireland including National Park, National Nature Reserve, RAMSAR site, UNESCO Biosphere reserves, Wildfowl Sanctuary, Special Protection Areas (SPA – Birds Directive), Special Areas of Conservation (SAC – Habitats Directive); and Natural Heritage Areas. The mechanism for these designations is through national or international legislation. Proposed NHAs (pNHA) are areas that have yet to gain full legislative protection. They are generally protected through the relevant County Development Plan. There is no system in Ireland for the designation

of sites at a local, or county level. Within 2km of the subject site no such areas can be found. A number of Natura 2000 sites are found off-shore however, and these may be linked to the development site via treated wastewater which is discharged from Balbriggan to the Irish Sea:

The **Rockabill to Dalkey Island SAC** (site code: 0300) was designated an off-shore SAC in 2013. It has two qualifying interests which are reefs and harbour porpoise *Phocoena phocoena*. Conservation objectives for this SAC have been published to maintain or restore the area of habitat and status of the population to 'favourable conservation status' (NPWS, 2013a).

- **Reefs** can be intertidal or subtidal features and are characterised by hard or rocky substrates. The main pressures that have been identified by the NPWS are commercial fishing, aquaculture, water pollution and commercial/recreational uses of the marine environment. Nationally their status is assessed as 'bad' (NPWS, 2013).
- **Harbour porpoise** This is the smallest cetacean species regularly occurring in Irish waters. It is commonly found in residential pods close to the shore and it is not considered threatened in Irish waters. Its status nationally is 'good'.

The **North-West Irish Sea SPA (site code: 4236)**. This is a large SPA that was designated in July 2023 and extends for 2,333km² from Dublin Bay in the south to the southern tip of Dundalk Bay in the north. It encompasses marine and coastal areas while bordering a number of other SPAs in this region. Table 4.1 lists its qualifying interests.

Table 4.1: Qualifying interests for the North-West Irish Sea SPA (EU code in square parenthesis)

Species	National Status ¹⁰
Roseate Tern (<i>Sterna dougallii</i>) [A192]	Amber (breeding)
Common Tern (<i>Sterna hirundo</i>) [A193]	Amber (breeding)
Arctic Tern (<i>Sterna paradisaea</i>) [A194]	Amber (breeding)
Little Tern (<i>Sterna albifrons</i>) [A195]	Amber (breeding)
Common Scoter (<i>Melanitta nigra</i>) [A065]	Red (breeding & wintering)
Red-throated Diver (<i>Gavia stellata</i>) [A001]	Amber (breeding & wintering)
Great Northern Diver (<i>Gavia immer</i>) [A003]	Amber (wintering)
Fulmar (<i>Fulmarus glacialis</i>) [A009]	Amber (breeding)
Manx Shearwater (<i>Puffinus puffinus</i>) [A013]	Amber (breeding)
Shag (<i>Phalacrocorax aristotelis</i>) [A018]	Amber (breeding)
Cormorant (<i>Phalacrocorax carbo</i>) [A017]	Amber (breeding & wintering)
Little Gull (<i>Larus minutus</i>) [A177]	Amber (passage)
Kittiwake (<i>Rissa tridactyla</i>) [A188]	Red (breeding)

¹⁰ Birds of Conservation Concern in Ireland. Gilbert et al., 2021

Species	National Status ¹⁰
Black-headed Gull (<i>Croicocephalus ridibundus</i>) [A179]	Amber (breeding & wintering)
Common Gull (<i>Larus canus</i>) [A182]	Amber (breeding & wintering)
Lesser Black-backed Gull (<i>Larus fuscus</i>) [A183]	Amber (breeding & wintering)
European Herring Gull (<i>Larus argentatus</i>) [A184]	Amber (breeding & wintering)
Great Black-backed Gull (<i>Larus marinus</i>) [A187]	Green (breeding & wintering)
Puffin (<i>Fratercula arctica</i>) [A204]	Red (breeding)
Razorbill (<i>Alca torda</i>) [A200]	Red (breeding)
Common Guillemot (<i>Uria aalge</i>) [A199]	Amber (breeding)

Figure 4.1: Site location showing nearby water courses



Rockabill SPA (site code: 4014). The small islands of Rockabill are to be found 7km off the shore of Dublin. It is an important breeding colony for seabirds and, in particular, is the largest breeding colony of Roseate Terns in Europe. It is managed by BirdWatch Ireland (NPWS, 2015). Qualifying interests are given in table 4.2.

Table 4.2: Qualifying Interests for Rockabill SPA

Species	National Status ¹¹
<i>Calidris maritima</i> Purple Sandpiper	Red (Wintering)
<i>Sterna dougallii</i> Roseate Tern	Amber (Breeding)
<i>Sterna hirundo</i> Common Tern	Amber (Breeding)
<i>Sterna paradisaea</i> Arctic Tern	Amber (Breeding)

- **Roseate Tern.** This tern breeds at only a few stations along Ireland's east coast. Most of these are in decline although at Dublin their colony is increasing.
- **Common Tern.** This summer visitor nests along the coast and on islands in the largest lakes. Its breeding range has halved in Ireland since the 1968-1972 period.
- **Arctic Tern.** These long-distance travellers predominantly breed in coastal areas of Ireland. They have suffered from predation by invasive mink and are declining in much of their range.

The web site of the National Parks and Wildlife Service (www.npws.ie) contains a mapping tool that indicates records of legally protected species within a selected Ordnance Survey (OS) 10km grid square. The Taylor's Hill site is located within the square O16, and one species of protected flowering plant is highlighted: the Red Hemp-nettle *Gaelopsis angustifolia*. There are no recent records of this species from this square (www.bsbi.org). It must be noted that this list cannot be seen as exhaustive as suitable habitat may be available for other important and protected species.

Water quality in rivers, canals and estuaries is monitored on an on-going basis by the Environmental Protection Agency (EPA). The development site is located within the catchment of the Bremore Stream (also referred to as the Clonard Brook). This small water course, a tributary of which can be found at the southern site boundary, enters the Irish Sea a short distance downstream. It is assessed by the EPA as 'poor' status under the Water Framework Directive (WFD) reporting period 2016-2021.

Table 4.3: Protected mammals in Ireland and their known status within the zone of influence

Species	Level of Protection	Habitat ¹²
Otter <i>Lutra lutra</i>	Annex II & IV Habitats Directive	Rivers and wetlands
Lesser horseshoe bat <i>Rhinolophus hipposideros</i>	Wildlife (Amendment) Act, 2000	Disused, undisturbed old buildings, caves and mines
Grey seal <i>Halichoerus grypus</i>	Annex II & V Habitats Directive	Coastal habitats
Common seal <i>Phocaena phocaena</i>	Wildlife (Amendment) Act, 2000	
Whiskered bat <i>Myotis mystacinus</i>		Gardens, parks and riparian habitats

¹¹ Birds of Conservation Concern in Ireland. Gilbert et al., 2021

¹² Harris & Yalden, 2008

Species	Level of Protection	Habitat ¹²
Natterer's bat <i>Myotis nattereri</i>	Annex IV Habitats Directive; Wildlife (Amendment) Act, 2000	Woodland
Leisler's bat <i>Nyctalus leisleri</i>		Open areas roosting in attics
Brown long-eared bat <i>Plecotus auritus</i>		Woodland
Common pipistrelle <i>Pipistrellus pipistrellus</i>		Farmland, woodland and urban areas
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>		Rivers, lakes & riparian woodland
Daubenton's bat <i>Myotis daubentonii</i>		Woodlands and bridges associated with open water
Nathusius' pipistrelle <i>Pipistrellus nathusii</i>		Parkland, mixed and pine forests, riparian habitats
Irish hare <i>Lepus timidus hibernicus</i>	Annex V Habitats Directive; Wildlife (Amendment) Act, 2000	Wide range of habitats
Pine Marten <i>Martes martes</i>		Broad-leaved and coniferous forest
Hedgehog <i>Erinaceus europaeus</i>	Wildlife (Amendment) Act, 2000	Woodlands and hedgerows
Pygmy shrew <i>Sorex minutus</i>		Woodlands, heathland, and wetlands
Red squirrel <i>Sciurus vulgaris</i>		Woodlands
Irish stoat <i>Mustela erminea hibernica</i>		Wide range of habitats
Badger <i>Meles meles</i>		Farmland, woodland and urban areas
Red deer <i>Cervus elaphus</i>		Woodland and open moorland
Fallow deer <i>Dama dama</i>		Mixed woodland but feeding in open habitat
Sika deer <i>Cervus nippon</i>		Coniferous woodland and adjacent heaths

(Harris & Yalden, 2008) Those cells that are greyed out indicate no records for this species in the O16 square.

4.3.2 SITE SURVEY

The development site is located within the Ladywell/ Folkstown area, to the east of Balbriggan, Co. Dublin. The site is currently occupied by a combination of agricultural land and disturbed ground. Mapping from the EPA shows a tributary of the Bremore Stream (also referred to as the Clonard Brook) flowing to the south. Lands to the east are developed or under construction while open, agricultural land lies to the north and west. Historic mapping shows that this general area was in agricultural use until relatively recently however significant land use change has occurred since the 1990s (www.osi.ie).

4.4 FLORA

The development site is composed of fields which were until recently entirely in agricultural production but are now a combination of disturbed ground associated with encroaching development to the east as well as remnants of pasture and tillage land.

Only small areas, which have remained undisturbed, are **dry meadow – GS2**. These are dominated by Thistles *Cirsium sp.*, Docks *Rumex sp.*, Creeping Buttercup *Ranunculus repens* and/or Perennial Rye *Lolium perenne*. Some areas of **arable crops – BC1** remain to the north.

To the south there is a field of **improved agricultural grassland – GA1**. A new road has been constructed along the eastern boundary and some of the adjacent land is **bare soil – ED2**, along with lands in the central portion of the site. These are habitats of low or negligible biodiversity value.

Traditional **hedgerow – WL1** field boundaries are found throughout and are composed of Hawthorn *Crataegus monogyna*, Grey Willow *Salix cinerea*, Ash *Fraxinus excelsior*, Blackthorn *Prunus spinosa* and Gorse *Ulex europaeus*. Non-woody species include Cow Parsley *Anthriscus sylvestris*, Meadowsweet *Filipendula ulmaria* and Primrose *Primula vulgaris* as well as the climbers Honeysuckle *Lonicera periclymenum*, Bitter-sweet *Solanum dulcamara* and Ivy *Hedera helix*. Hedgerows to the south tend to be dense and species rich with tall trees. These include some very large Oak *Quercus sp.* to the south-east. Following methodology from the Heritage Council these can be assessed as of 'higher significance' and are of high local value to biodiversity (Foulkes et al., 2014). Hedgerows to the south are accompanied by **drainage ditches – FW4** which add structure and diversity.

The hedgerows to the north as well as along the western roadside have few or no tall trees and are species poor and so these are assessed as of 'lower significance'. One stretch of hedgerow around a residential home is dominated by non-native Cypress *Cuprocyparis sp.* and this is of negligible wildlife value. The hedgerow along the boundary with the R122 is relatively-recently planted and is also 'lower significance'. The **treeline – WL2** to the south-west is composed of all Ash, Sycamore *Acer pseudoplatanus* and Beech *Fagus sylvatica*. Vegetation at ground level includes Alexanders *Smyrniololus atrum* and Brambles *Rubus fruticosus agg.*

The drainage ditches are not suitable for salmonid or migratory fish as the Bremore Stream is extensively culverted as it flows through Balbriggan. There are no plants growing on the site which are protected or threatened. There are no habitats which are listed under Annex I of the Habitats Directive, or habitats which are generally associated with species listed in Annex II. There are no plant species which are listed as alien invasive under Schedule 3 of SI No. 477. The features described above are shown as a habitat map in figure 4.2.

4.5 FAUNA

There is no suitable habitat on the lands for Otter.

There was no evidence of Badger activity during any of the surveys and no sett is present.

Features on the site are mostly sub-optimal for bat roosting, with no buildings however there are some old trees with cracks and crevices to the south-east which may be suitable (Hundt, 2013). An assessment of the site for bats was originally carried out by Brian Keeley of Wildlife Surveys Ireland in January 2020. It identified the large trees to the south of the site as having bat roost potential. This was followed in June 2020, August 2022 and May 2024 by a full, detector-based survey. This found no bats roosting on the development site. In 2020 three species were foraging: Common Pipistrelle, Soprano Pipistrelle and Leisler's Bat while in 2022 these species were again noted along with Brown Long-eared Bat. In May 2024 all of these species were again noted along with Natterer's bat. The bat report prepared by Brian Keeley, included with the LRD application, notes that "the most commonly encountered bat species was common pipistrelle" while Brown Long-eared Bat and Natterer's Bat were noted by a single specimen each and Soprano Bat activity was "low". A roost of Common Pipistrelle was recorded in a farm building on the Clonard Road, which is outside the development site boundary and will not be affected by the development.

Habitat is not available for Red Deer, Pine Marten or Red Squirrel. Irish Hare are widespread in Ireland and avail to a large extent of agricultural lands. Nevertheless, no record of its presence was found. Small mammals such as the Irish Stoat, Hedgehog and Pygmy Shrew are considered more or less ubiquitous in the Irish countryside, and may be active throughout (Lysaght & Marnell, 2016). Rabbits *Oryctolagus cuniculus* were seen. No other direct evidence of any mammal was recorded although Fox *Vulpes Vulpes* is common along with Brown Rat *Rattus norvegicus*, House Mouse *Mus domesticus* and Field Mouse *Apodemus sylvaticus*. These species are not protected.

June lies within the optimal season for surveying breeding birds. July lies within the breeding season however is sub-optimal as much nesting has ceased. Surveys were undertaken before noon and attempted to identify all breeding or nesting activity: singing/holding territory or carrying food/nesting material. The following birds were noted in June 2020: Blackbird *Turdus merula*, Goldfinch *Carduelis carduelis*, Blue Tit *Parus caeruleus*, Wren *Troglodytes troglodytes*, Wood Pigeon *Columba palumbus*, Yellowhammer *Emberiza citronella*, Dunnock *Prunella modularis*, Song Thrush *T. philomelos* and Linnet *Carduelis cannabina*. All of these species are listed as 'low conservation concern' (green list) by BirdWatch Ireland, with the exception of Linnet, which is 'medium conservation concern' (amber list) and Yellowhammer, which is of 'high conservation concern' (red list).

In July 2022 the following species were recorded: Wren. Yellowhammer was heard holding territory close to, but away from the development site boundary.

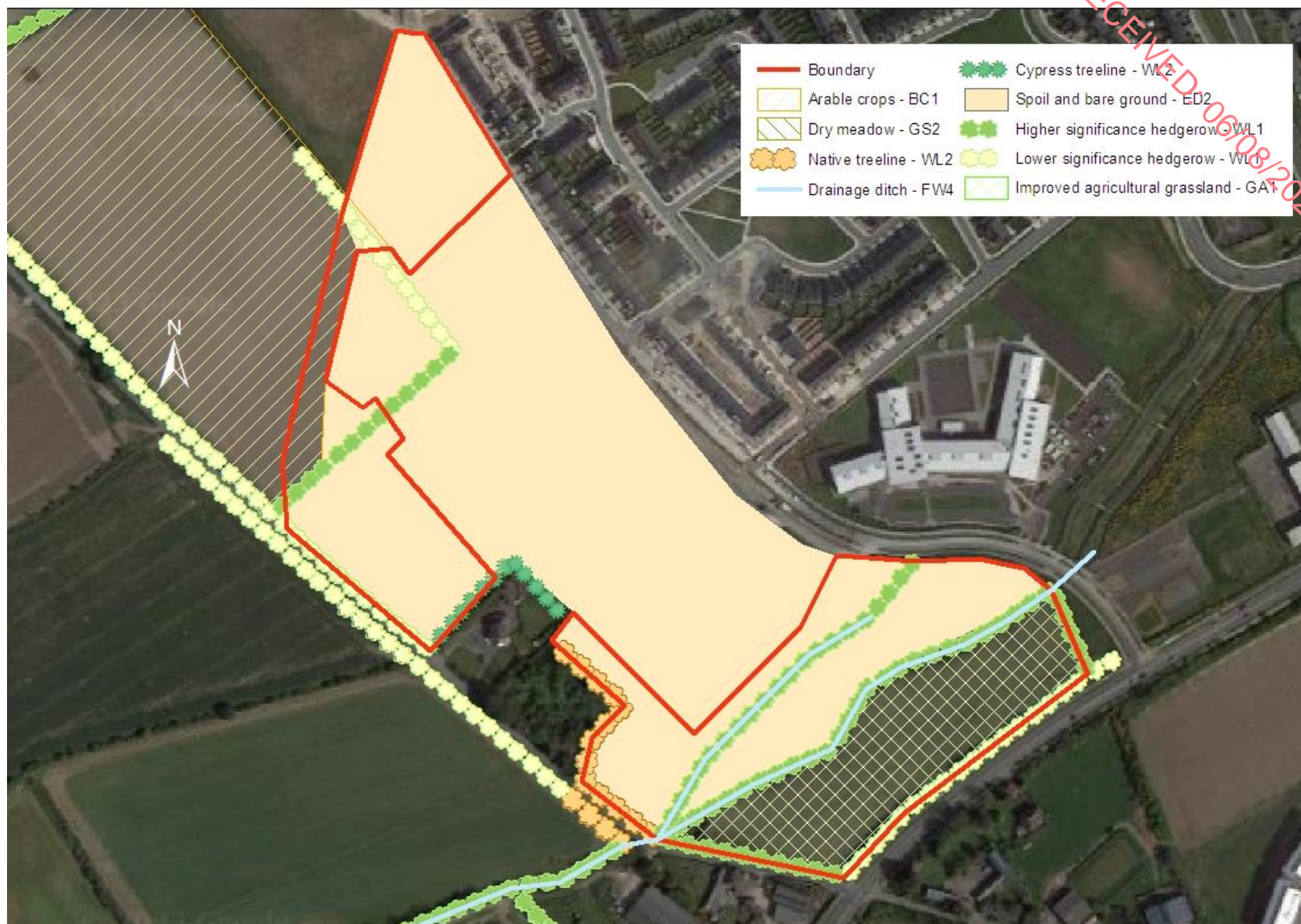
In May 2023 the following birds were noted: Blackbird, Blue Tit, Wood Pigeon and Starling *Sturnus vulgaris*. All of these species are listed as 'low conservation concern' (green list) by BirdWatch Ireland,

During the winter (January '20 & '21) surveys the following species were noted: Wood Pigeon, Blackbird, Greenfinch *Carduelis chloris*, Wren, Goldfinch, Buzzard *Buteo buteo* and Hooded Crow *Corvus corone*.

Surveys in January, February and March '24 noted: Blackbird, Wood Pigeon, Buzzard, Goldcrest *Regulus regulus*, Linnet *Carduelis cannabina*, Jackdaw *Corvus monedula*, Magpie *Pica pica*, Wren *Troglodytes troglodytes*, Pheasant *Phasianus colchicus*, Coal Tit *Parus ater*, House Sparrow *Passer domesticus* and Robin *Erithacus rubecula*.

The breeding bird survey of April '24 noted Wood Pigeon, House Sparrow, Pheasant, Blackbird and Magpie. The field of arable crops to the north had been recently ploughed and this attracted a small flock of Rook *Corvus frugilegus*, Herring Gull *Larus argentatus* and a single Great Black-backed Gull *Larus marinus*. These species were not noted to be breeding on, or directly adjacent to, the development lands.

All of these species, with the exception of those noted in the ploughed field in April '24, are farmland/countryside birds and there were no species which could be considered wetland or wading birds.

Figure 4.2: Habitat map

Of those species listed by BirdWatch Ireland as being of high conservation concern Grey Partridge *Perdix perdix*, Corncrake *Crex crex*, Barn Owl *Tyto alba* and Yellowhammer *Emberiza citrinella* were recorded as breeding in North Dublin during the 2007-11 Bird Atlas project (Balmer et al., 2013). There is no suitable breeding habitat for Barn Owl on the subject lands while records for Corncrake and Grey Partridge date from pre-1972. Yellowhammer are known from arable fields in North County Dublin and can be late breeders. They are not migratory and are known to stay close to their territories throughout the year. On the Taylor's Hill site, no singing Yellowhammer were noted from within the development site boundary.

Drainage ditches are suitable for breeding Common Frog *Rana temporaria*, while Common Lizard *Zootoca vivipara* is considered widespread. There are no ponds is suitable for Smooth Newt *Lissotriton vulgaris*.

The development site is in the catchment of no water course of fisheries significance. The Bremore Stream is unlikely to be of significance for salmonid fish due to its small size and the presence of numerous culverts along its length. There are no habitats on the development site suitable for migratory fish.

Most habitats, even highly altered ones, are likely to harbour a wide diversity of invertebrates. In Ireland only one insect is protected by law, the Marsh Fritillary butterfly *Euphydryas aurinia*, and this is not to be found on habitats such as these.

4.5.1 OVERALL EVALUATION OF THE CONTEXT, CHARACTER, SIGNIFICANCE AND SENSITIVITY OF THE PROPOSED DEVELOPMENT SITE

In summary, it has been seen that the application site is within an area of disused land. There are no examples of habitats listed on Annex I of the Habitats Directive or records of rare or protected plants. There are no alien invasive species as listed under Schedule 3 of SI No. 477 of 2011.

Hedgerows and the native treeline provide habitats for nesting birds while drainage ditches provide some habitat for aquatic vegetation and amphibians.

Significance criteria are available from guidance published by the National Roads Authority (NRA, 2009). These are reproduced in table 4.4. From this an evaluation of the various habitats and ecological features on the site has been made and this is shown in table 4.5.

Table 4.4: Site evaluation scheme taken from NRA guidance 2009

Site Rating	Qualifying criteria
A - International importance	<p>SAC, SPA or site qualifying as such.</p> <p>Sites containing 'best examples' of Annex I priority habitats (Habitats Directive).</p> <p>Resident or regularly occurring populations of species listed under Annex II (Habitats Directive); Annex I (Birds Directive); the Bonn or Berne Conventions.</p> <p>RAMSAR site; UNESCO biosphere reserve;</p> <p>Designated Salmonid water</p>
B - National importance	<p>NHA. Statutory Nature Reserves. Refuge for Flora and Fauna. National Park.</p> <p>Resident or regularly occurring populations of species listed in the Wildlife Act or Red Data List</p> <p>'Viable' examples of habitats listed in Annex I of the Habitats Directive</p>

C - County importance	<p>Area of Special Amenity, Tree Protection Orders, high amenity (designated under a County Development Plan)</p> <p>Resident or regularly occurring populations (important at a county level, defined as >1% of the county population) of European, Wildlife Act or Red Data Book species</p> <p>Sites containing semi-natural habitat types with high biodiversity in a county context, and a high degree of naturalness, or populations of species that are uncommon in the county</p>
D - Local importance, higher value	<p>Sites containing semi-natural habitat types with high biodiversity in a county context, and a high degree of naturalness, or populations of species that are uncommon in the locality</p> <p>Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.</p>
E - Local importance, lower value	<p>Sites containing small areas of semi-natural habitat that are of some local importance for wildlife;</p> <p>Sites or features containing non-native species that are of some importance in maintaining habitat links.</p>

Table 4.5: Evaluation of the importance of habitats at the LRD lands

<p>Bare soil – ED2</p> <p>Improved agricultural grassland – GA1</p> <p>Arable crops – BC1</p> <p>Cypress treeline – WL2</p>	Negligible ecological value
<p>Dry meadows – GS2</p> <p>Lower significance hedgerow – WL1</p>	Low local ecological value
<p>Higher significance hedgerow – WL1 (with drainage ditch – FW4)</p> <p>Native treeline – WL2</p>	High local ecological value

4.6 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The development will consist of the construction of 197 no. dwellings, open space and ancillary infrastructure on lands with a combined area of c.7.15 hectares will facilitate Phase 4 of the lands at Folkstown in Balbriggan as follows:

- A) 155 no. terraced and semi-detached houses comprising 82 no. 2-bedroom houses (House Type E – 2 storey), 64 no. 3-bedroom houses (House Types D, D2, D3, F, F2, F3, F4 – 2 storey) and 10 no. 4-bedroom houses (House Types F5, F6 – 3 storey);
- B) 20 no. 1 bedroom Maisonettes [Apartment Types P1, P2, P3, & P4] in 10 no. 2-storey semi-detached buildings, and 4 no. 1 bedroom apartments (Type A1) in a 3 storey building with a ground floor commercial unit c. 350 sq. m (all apartments with private open space);

- C) 18 no. 3 bedroom duplex apartments (Apartment Types G1, G2 & G3) in 4 no. 3 storey buildings;
- D) Public open space c.0.82 hectares (with an additional c. 0.76 hectares of riparian corridor open space), hard and soft landscaping (including public lighting & boundary treatment) and c.495 sq.m of Communal Open Space for the proposed duplex and apartment units;
- E) Vehicular access will be provided via the Boulevard Road as well as via Clonard Road along with the provision of car parking spaces (225 no.), bicycle parking spaces and all internal roads and footpaths;
- F) Provision of surface water attenuation measures, connection to water supply, provision of foul drainage infrastructure to Irish Water specifications and all ancillary site development, construction, and landscaping works; and
- G) The proposal will also amend the layout to elements of the shared layout across the permitted phases to include (Phase 3A [F21A/0055;ABP Ref:312048-21] relating to 29 no. dwellings replaced with 27 no. dwellings, Phase 3B [F22A/0526] relating to layout and Phase 3C [F22A.0670] relating to 3 no. dwellings replaced with 4 no. dwellings and associated amendments to attenuation and services.

Post-construction the site will be landscaped while the operation phase will see the homes occupied. Additional noise, human activity and artificial lighting will therefore be a feature.

Site clearance will require the removal of low value agricultural habitats as well as selected trees hedgerows and, where relevant, culverting of drainage ditches.

An open amenity area is to be installed along the western margin of the site which will include new nature-friendly planting.

4.7 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT IN THE ABSENCE OF MITIGATION

This section provides a description of the potential impacts that the proposed development may have on flora & fauna in the absence of mitigation. Methodology for determining the significance of an impact has been published by the NRA (NRA, 2009).

4.7.1 CONSTRUCTION PHASE

The following potential impacts are likely to occur during the construction phase **in the absence of mitigation**:

1. The removal of habitats including bare soil, arable crops, dry meadow and improved agricultural grassland.

This effect is likely, negative, imperceptible and permanent.

The removal of hedgerows. Figure 4.3 shows the extent of hedgerow and treeline removal/retention. This will amount to the loss of 375m of 'lower significance' hedgerow and c.265m of 'higher significance' hedgerow (570m in total). There will be retention of 90m of 'lower significance' hedgerow and 460m of higher significance hedgerow. In addition, there will be the removal of 200m of treeline habitat albeit a number of mature trees in this stretch are to be retained. This will affect species which are common and widespread in the Irish countryside including reduced feeding opportunities for bats.

This effect is likely, significant,

1. Mortality to animals during construction. Disturbance to birds' nests, their eggs or young is prohibited under the Wildlife Act. The direct disturbance of species during land clearance. This can affect nesting birds as well as small mammals but is dependent upon the timing of works. Under the Wildlife Act the removal of vegetation is prohibited between March and August. There are no confirmed bat roosts on the site. Nevertheless, trees with roost potential to be removed must be inspected prior to works.

This effect is likely, negative, significant and permanent.

1. Pollution during construction. While the risk of pollution to the Bremore Stream is moderate, the water course itself is not of high fisheries or biodiversity value. However, the receiving waters at the Irish Sea are within the North West Irish Sea SPA and so are of high biodiversity value. Proposed drainage and attenuation measures will be an extension of those permitted under previous phases of this development and include discharge to drainage ditches leading to the Bremore Stream. A Construction Environment Management Plan has been prepared by Paul McGrail Consulting Engineers (included in Appendix D Volume III of the EIAR) and this includes measures to prevent pollution of waterways during the construction phase. The measures set out in the CEMP will form part of the mitigation relating to Contractor's CEMP.

This effect is likely, negative, significant and temporary.

4.7.2 OPERATION PHASE

The following potential impacts are likely to occur during the operation phase **in the absence of mitigation**:

2. Impacts to species through the disruption of ecological corridors: bats may be impacted through the loss of foraging territory (hedgerows). According to the bat survey report: *“Reduced vegetation including the removal of mature trees and hedgerow may lead to reduced insect abundance. The removal of vegetation and change of land use and habitats will reduce bat feeding opportunities. This is likely to be a permanent slightly negative impact.”*

The loss of habitat will result in a loss of potential breeding grounds for species such as Hedgehog, Irish Stoat, Irish Hare and Pygmy Shrew as well as common countryside birds, plants and invertebrates.

This effect is likely, negative, slight and medium-term.

3. Pollution of water from surface water run-off. The Greater Dublin Strategic Drainage Study (2005) identified issues of urban expansion leading to an increased risk of flooding in the city and a deterioration of water quality. This arises where soil and natural vegetation, which is permeable to rainwater and slows its flow, is replaced with impermeable hard surfaces. Surface water from the project footprint will drain to the Bremore Stream. In this way, rain runoff will be separated from foul wastewater within the site. Sustainable drainage systems (SuDS) are to be incorporated into the project design and this will include permeable paving, swales, bioretention systems, tree pits, above-ground detention basins, a petrol interceptor and flow control device. Runoff will consequently be maintained at a *‘greenfield’* rate.

This effect is unlikely, negative, imperceptible and permanent.

4. Pollution of water from foul wastewater arising from the development. Wastewater from the development will be treated at the Balbriggan wastewater treatment plant. This is licenced by the EPA to discharge treated effluent to the Irish Sea (licence no. D0023-01). As such there is a pathway to the waters of the North West Irish Sea SPA, Rockabill to Dalkey Island SAC and Rockabill SPA from this source. The plant is built to modern standards and has a capacity to treat a population equivalent (P.E.) of 70,000. According to the EPA this plant was in compliance with the emission standards set under the Urban Wastewater Treatment Directive for 2022 (the most recent year for which figures are available). The status of the coastal waters in the SPA and SAC is assessed as ‘high’ while ambient monitoring indicates that *“the discharge from the wastewater treatment plant does not have an observable negative impact on the water quality status”*.

This effect is unlikely, negative, imperceptible and permanent.

5. Disturbance to species from increased human activity (lighting, pets etc.). The species/habitats present on this site are not considered sensitive to disturbance from noise or general human activity. Bats may be sensitive to the additional artificial lighting that may arise from this development. According to the bat survey report: "Lighting will be utilised for two different functions:

- 1) Access and safety and
- 2) Security and policing.

The former is to allow ease of use at night. The latter is to ensure a perceived higher security level. This may affect light intolerant bat species during foraging and if directed at emergence points would affect all bat species, even those that will feed in illuminated areas. Species such as common pipistrelle and Leisler's bat are less affected than almost all other Irish bat species. A Myotis species (probably Natterer's bat) and a Brown long-eared bat were noted during the May 2024 assessment. These are light-intolerant bat species. At worst, it would be a permanent moderately negative impact in the absence of mitigation

The lighting plan prepared by ENX, has been reviewed by the bat ecologist to ensure that effects to these sensitive species are minimised.

This effect is likely, negative, significant and permanent.

6. Impacts to protected areas. There is a potential pathway to the North West Irish Sea SPA, Rockabill to Dalkey Island SAC and Rockabill SPA from treated wastewater and construction run-off from the development. However this is pathways is weak due to the enormous dilution effect in the Irish Sea. A separate screening report for Appropriate Assessment has been presented and this concludes that significant effects to the North West Irish Sea SPA during the construction phase cannot be ruled out. A Natura Impact Statement has been prepared which details the mitigation measures that will ensure that effects to the integrity of this SPA will not arise.

There is no pathway to any other area designated for nature conservation from this development.

This effect is likely, negative, significant and temporary.

Table 4.6: Significance level of likely impacts in the absence of mitigation

Impact Construction phase		Significance
1a	Habitat loss of features of low local or negligible value	likely, negative, imperceptible and permanent
1b	Habitat loss of features of high local value	likely, negative, significant and permanent
2	Disturbance to animals during construction	likely, negative, significant and permanent
3	Pollution of water during construction phase	likely, negative, significant and temporary
4	Disruption of ecological corridors/loss of habitat for common and widespread species	likely, negative, slight and medium-term
5	Surface water pollution during operation	unlikely, negative, imperceptible and permanent
6	Wastewater during operation	unlikely, negative, imperceptible and permanent
7	Disturbance to species from human disturbance (lighting)	likely, negative, significant and permanent

Impact		Significance
Construction phase		
8	Impacts to protected areas	unlikely, negative, significant and temporary

Overall, it can be seen that four potentially significant negative impacts are predicted to occur as a result of this project in the absence of mitigation (impacts 3 and 8 are the same).

4.7.3 POTENTIAL CUMULATIVE IMPACTS

This planning application can be viewed as part of wider development by Glenveagh Homes which recently developed Phase 1 at Taylor Hill which comprises 137 no. dwellings on a site of c. 6.2 hectares and Phase 2 at Taylor Hill comprising c. 248 no. dwellings on a site of c. 7.6 hectares. The proposal will include roads and services to facilitate development of 306 no. units on the overall Phase 3 (Phases 3A-3D) Masterplan lands of 9.35 hectares (including Class 1 Public Open Space of c. 0.65 hectares). In summary the overall works for Phase 3 relate to 8.7 hectares (main development site), 0.65 hectares (Class 1 Open Space to the north) and road works to the Boulevard and Clonard Road junction upgrade of 0.49 hectares, resulting in an overall gross site area of 9.84 hectares. It is noted that elements of the permitted Phase Ladywell development forms part of the Phase 4 Folkstown LRD application site. Other developments considered include Dean Swift Property Holdings Unlimited Company (Planning Ref. LRD0006/S3); and Harvest Lodge Distilleries LTD (Planning Ref. F22A/0033).

In addition, infrastructure works to facilitate future community facilities and residential development located in the townlands of Balbriggan, Hampton Demesne and Kilsough North, Co. Dublin have been approved (ABP Ref. 312529-22).

A number of the identified impacts can also act cumulatively with other impacts from similar developments in the Dublin and Balbriggan area. These primarily arise through the urbanisation of the city's hinterland as provided for by land use zoning and include pollution from surface water run-off and pollution from wastewater generation.

A cumulative loss of wildlife value however will be experienced as land use changes in this area from open to suburban. This is offset somewhat as open green spaces and private gardens mature over time. It is considered that the species which are already present in this area will not suffer significant cumulative long-term consequences arising from this land use change.

This development can be viewed alongside the construction of new housing developments to the east (by Glenveagh Homes Ltd., outlined above) which are recently completed, under construction or under consideration by the planning authority. These are provided for under the Fingal County Development Plan 2023-2029. This will see the conversion of all these lands from agricultural to a combination of built and amenity space. These lands are zoned for residential development.

4.7.4 'NO NOTHING' IMPACT

In the event that this project does not proceed the land can be expected to remain in agriculture use for the foreseeable future. Existing wildlife populations would remain relatively undisturbed.

4.8 AVOIDANCE, REMEDIAL AND MITIGATION MEASURES

This report has identified four impacts that were assessed as ‘significant’. Mitigation is therefore recommended to reduce the severity of these effects.

4.8.1 CONSTRUCTION PHASE

BIO CONST 1: Loss of high value hedgerow habitat – mitigation by offset.

Habitat loss will be offset by new planting proposed in the landscaping scheme. This is shown in figure 4.4. According to the landscape report:

“there will be a net gain for biodiversity by planting native tree species, coupled with plants selected from a list of pollinator friendly species and maintained to increase the availability of flowering plants in the shoulder months.”

New planting includes c.125m of new native hedgerow along the Clonard Road as well as new trees throughout. Species to be planted have been chosen for their biodiversity benefit including native and non-native trees and those which are pollinator friendly.

The Riparian Corridor is seen as providing foraging opportunities for the three species of bat who were identified as feeding on the site. No bats were found to be roosting on the site. However, it is considered advisable to provide roosting opportunities on site and install ‘6x 2F Schwegler bat boxes in unlit areas at least 2.5m above ground with no surrounding branches or brambles.

Figure 4.3: Landscaping proposal



BIO CONST 2: Mortality to animals during construction – mitigation by avoidance

The following is recommended for the bat report:

“All trees with roost potential shall be checked by a bat specialist prior to felling or surgery. The roost potential shall be determined by a bat specialist prior to tree felling.

All trees with roost potential shall be felled between September and November to ensure that bats are not breeding or hibernating within trees and to ensure that nesting birds are unaffected (March 1st to August 31st).”

Planting of vegetation

Where there is an opportunity to provide vegetative cover, some native and local plant species should be employed such as dog rose with an encouragement of species such as Clematis, Hebe, night-scented stock, Nicotiana and other species attractive to moths. The retention of mature oak is recommended including surgery in preference to felling wherever feasible.

The retention of as much of the existing beech as possible is recommended including surgery in preference to felling wherever feasible.

Bat boxes

While no bat roosts were identified from this out of season survey trees within the site offer good roost potential and there may be roost loss. 6 x 2F Schwegler bat boxes or equivalent are proposed for installation (in unlit areas at least 2.5 metres above ground level with no surrounding clutter – branches, bramble etc.). Where there are no suitable locations for bat boxes on trees or other structures, equivalent bat boxes (i.e. 4 x 2FR boxes) shall be incorporated into buildings.

BIO CONST 3: Pollution during construction – mitigation by reduction

A Construction Method Statement has been prepared, and which includes pollution prevention measured in accordance with best practice guidelines from Inland Fisheries Ireland (2016). This will include the erection of a robust silt curtain (or similar barrier) along open drainage ditches to prevent the ingress of silt to the Bremore Stream. Water leaving the site will pass through an appropriately sized silt trap or settlement pond so that only silt-free run-off will leave the site.

A silt curtain or similar barrier will be erected along the drainage ditch leading to the Bremore Stream and will remain in place for the duration of works.

Dangerous substances, such as oils, fuels etc., will be stored in a bunded zone. Emergency contact numbers for the Local Authority Environment Section, Inland Fisheries Ireland, the Environmental Protection Agency and the National Parks and Wildlife Service will be displayed in a prominent position within the site compound. These agencies will be notified immediately in the event of a pollution incident.

Site personnel will be trained in the importance of preventing pollution and the mitigation measures described here to ensure same.

• **Headwall and Surface Water Sewer Construction**

It is proposed to install of pre-cast headwalls leading to the drainage ditch as part of the surface water drainage system at the site. All in-stream works will be carried out in accordance with an approved method statement.

Prior to construction of the headwall, a constraints zone will be identified and implemented at the construction area adjacent to the ditch/stream. This area will ensure the avoidance of physical damage to the ditch/stream, to ensure all work will be carried out in the dry and effectively isolated from the surface water network, and to ensure that no suspended sediment and associated nutrients are released into surface waters from excavation and earthworks. Where works are required that extend to the full width of

the ditch, a culvert for example, these works also need to be undertaken entirely in the dry. The location will be dammed at both ends so that no scouring of silt or sediment will take place.

No in-stream bed material is to be removed and no in-stream works are to be undertaken.

• **General Water Protection Measures (taken from the Construction Environmental Management Plan prepared by Paul McGrail Construction Engineers – contained in Appendix D Volume III of the EIA)**

Works will follow best practice guidance as outlined in Guidelines on the Protection of Fisheries during Construction Works in and Adjacent to Waters (IFI, 2016), CIRIA 2010 Environmental Good Practice on Site & CIRIA 2001 Control of Water Pollution from Construction Sites: Guidance for Consultants and Contractors. Although the risk of any significant impact on water quality in any receiving water bodies is considered to be extremely low given the lack of running water features on the site. Best practice will be implemented at all times in relation to all construction activities to avoid any accidental pollution events occurring to the wet ditches in the area or polluting the ground water table.

This will include the following actions:

- SuDS will be constructed in line with manufacturer's guidelines / best practice methods.
- At this development consist of attenuation system stormtech underground to cater for the 100-year return period and a detention basin to cater for the 1-100 year were designed for this site. The design of the attenuation is in accordance with CIRIA SuDS Manual C753 2015. Please refer to the accompanying drawings for further information.
- During construction, any surfaces which are intended to enable infiltration must be protected from compaction. This includes protecting from heavy traffic or storage materials.
- Water contaminated with silt will not be allowed to enter a watercourse or drain as it can cause pollution. All parts of the drainage system will be protected from construction runoff to prevent silt clogging the system and causing pollution downstream. Measures to prevent this include, early construction of sediment management basins, channelling run-off away from watercourses and surface water drains and erosion prevention measures.

Following construction, subsoil that has been compacted during construction should be broken up prior to the re-application of topsoil to reinstate the natural infiltration performance of the ground.

- Pipe systems and orifices will be checked for blockages or partial blockages.
- Silt deposited during construction will be removed.
- Soils will be stabilised and protected from erosion whilst planting becomes established.

Hydrocarbons or any hazardous chemicals will be stored in specific bunded areas.

Refuelling of plant and machinery will also be carried out in bunded areas to minimise risk of any potential pollutants being discharged from the site.

- Pollution control measures will be implemented to control run-off from the site and prevent run-off which is potentially contaminated with sediments or hazardous chemicals entering the drainage network.
- Pouring of cement-based materials for works will only be carried out in dry conditions.

Pumped concrete will be monitored to ensure there is no accidental discharge. Mixer washings and excess concrete will not be discharged directly into the drainage network.

Concrete washout areas will be created to avoid any accidental discharge from the proposed development site.

- Foul drainage from site offices and compound, where not directed to the existing wastewater network, will be contained and disposed of off-site in an appropriate manner and in accordance with the relevant statutory regulations to prevent the pollution of watercourses.

- A response procedure will be put in place to deal with any accidental pollution events and spillage kits will be available on site. Construction staff will be familiar with the emergency procedures and use of the equipment.

4.8.2 OPERATIONAL PHASE

BIOCONST 4: Impacts from lighting – mitigation by reduction

The following is recommended:

Lighting should be controlled to avoid light pollution of green areas and should be targeted to areas of human activity and for priority security areas. Motion-activated sensor lighting is preferable to reduce light pollution. This may be achieved through cowls and appropriately directed lighting. No lighting should exceed 3 lux along the treetops of the bordering remaining trees (and those trees to be planted when mature).

The lighting proposed has been examined and has taken these recommendations into account.

The lighting detail can be seen in the ENX Consulting letter which confirms that *“the public lighting has been designed to a lighting class of P4 (EN13201), with a step back to Lighting class P5 after 12 O’Clock Midnight.*

We can further confirm we have designed the public lighting for the scheme in accordance with Bat Conservation Ireland guidelines; Bat Conservation Ireland (Bats and Lighting: Guidance Notes for Planners, Engineers, Architects and Developers, BCI, 2010) and the Bat Conservation Trust (Guidance Note 08/18 Bats and Artificial Lighting in the UK (BCT, 2018). A lighting accessory in the form of cowls may be installed where necessary as a preventative measure to reduce unwanted light spill. The proposed lamps have limited backward light properties thus assisting in reducing backward light spill. Lamps have also been specified with 0 Degree tilt to ensure limited unwanted light spill. Lamps shall have a narrow spectrum and limited UV component.”

4.8.3 ‘WORST-CASE’ SCENARIO

In a worst-case scenario, some pollution of the Bremore Stream would occur during the construction phase. However, given the mitigation measures set out above this is considered unlikely to occur.

4.9 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

This section allows for a qualitative description of the resultant specific direct, indirect, secondary, cumulative, short, medium and long-term permanent, temporary, positive and negative effects as well as impact interactions which the proposed development may have, assuming all mitigation measures are fully and successfully applied.

In terms of predicted specific impacts on biodiversity there is no likely significant impact on the natural heritage, sensitive species or the qualifying interest (habitat/species) of any Natura 2000 site in the vicinity of the proposed development site.

4.9.1 CONSTRUCTION PHASE AND OPERATIONAL PHASE

The proposed development at Phase 4 Folkstown has been assessed from the perspective of ecology and detailed mitigation measures are presented to reduce impacts on species of European and national conservation interest present in the vicinity of the proposed development and surrounding lands.

The implementation of the mitigation measures highlighted in Section 4.8 will ensure that the predicted impacts of the development on flora and fauna are reduced during the construction phase.

Table 4.7: Significance level of likely impacts with the full implementation of mitigation

Impact		Significance
Construction phase		
1	Habitat loss of features of low local or negligible value	likely, negative, imperceptible and permanent
2	Habitat loss of features of high local value	likely, negative, minor negative and permanent
3	Disturbance to animals during construction	likely, negative, imperceptible and permanent
4	Pollution of water during construction phase	likely, negative, imperceptible and medium-term
5	Disruption of ecological corridors/loss of habitat for common and widespread species	likely, negative, slight and medium-term
6	Surface water pollution during operation	unlikely, negative, imperceptible and permanent
7	Wastewater during operation	unlikely, negative, imperceptible and permanent
8	Disturbance to species from human disturbance (lighting)	likely, negative, imperceptible and permanent
9	Impacts to protected areas	unlikely, negative, imperceptible and permanent

During the operational phase, with mitigation, there are expected to be no residual negative effects to biodiversity which can be considered to be significant.

4.10 MONITORING

Monitoring is required where the success of mitigation measures is uncertain or where residual impacts may in themselves be significant.

4.10.1 CONSTRUCTION PHASE

The mitigation measures are considered to be standard measures and come with a high level of confidence with regard to their success. Further monitoring is not required.

4.11 REINSTATEMENT

Post-construction landscaping will include new planting in areas of open space and along streets. The landscaping scheme has been designed in part to offset losses of hedgerow habitat which will occur.

4.12 INTERACTIONS

The key environmental interactions with biodiversity are with water and landscaping. A series of mitigation measures are set out in the Water Chapter of the EIAR which will ensure the quality (pollution and sedimentation) and quantity (surface run-off and flooding) is of an appropriate standard. With these mitigation measures in place, interaction between Biodiversity and water is considered to be neutral, and the interaction between biodiversity and landscaping is considered to be neutral.

4.13 DIFFICULTIES ENCOUNTERED IN COMPILING

This chapter is based on a number of site visits across the seasons, dedicated surveys for specialist species groups, and thorough consultation with statutory stakeholders. No difficulties were encountered in compiling this study.

RECEIVED: 06/08/2024

5.0 LAND, SOILS, GEOLOGY & HYDROGEOLOGY

5.1 INTRODUCTION

This Chapter assesses and evaluates the potential impacts of the Proposed Development on the land, soils, geological and hydrogeological aspects of the site and surrounding area. In assessing likely *potential* and predicted effects, account is taken of both the importance of the attributes and the predicted scale and duration of the likely effects. The impact on hydrology is addressed in Chapter 6 (Hydrology).

This Chapter has been written and prepared by Luke Maguire Environmental Consultant and Geoscientist (BSc) at AWN Consulting and Teri Hayes (BSc MSc PGeol EurGeol) Senior Hydrogeologist and director at AWN Consulting. Luke Maguire; is an Environmental Consultant at AWN with over 3 years of experience in Environmental Consulting and water resources. Luke holds a B.Sc. in Geoscience (Geology, Hydrology, Geochemistry, Geophysics, Climate and Environmental studies) from Trinity College University of Dublin and has worked on a range of developments including pharmaceutical plants, medical device facilities, ICT facilities and energy projects. Luke has experience in contaminated soil sampling and analysis, basement impact assessments, bulk excavations and largescale dewatering processes. Additionally, Luke has gained experience in Environmental Impact Assessment (EIAR), Hydrological Risk Assessment, and WFD Assessment Reporting and has worked in multiple Environmental monitoring disciplines such as Chemical Wastewater (Intel), Ground Gas, Surface Water, and Groundwater Monitoring at numerous sites across Dublin.

Teri is a hydrogeologist with over 25 years of experience in water resource management and impact assessment. She has a Masters in Hydrogeology and is a former President of the Irish Group of the Association of Hydrogeologists (IAH) and has provided advisory services on water related environmental and planning issues to both public and private sector bodies. She is qualified as a competent person as recognised by the EPA in relation to contaminated land assessment (IGI Register of competent persons www.igi.ie). Her specialist area of expertise is water resource management eco-hydrogeology, hydrological assessment and environmental impact assessment.

5.2 METHODOLOGY

5.2.1 CRITERIA FOR RATING EFFECTS

The Chapter has been prepared in accordance with European Commission's guidelines, *Guidance on the preparation of the Environmental Impact Assessment Report* (2017), the EPA *Guidelines on the information to be contained in EIAR* (2022) and the EU Commissions *Notice on changes and extensions to projects* (2021).

The appraisal methodology for the EIAR is completed in accordance with 'Draft Guidelines on the Information to be contained in Environmental Impact Statements' (EPA, 2022) and Institute of Geologists of Ireland (IGI) 'Geology in Environmental Impact Statements, a Guide', (IGI, 2002) and 'Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements' (IGI 2013). In addition, 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' by the Transport Infrastructure Ireland (TII, 2009) is referenced where the methodology for assessment of impact is appropriate.

The rating of potential environmental impacts on the land, soils and geological environment is based on the quality, significance, duration, and type of impact characteristic identified. Consideration is given to both the importance of an attribute and the magnitude of the potential environmental impacts of the proposed activities on that cited attribute. The EIAR guideline tables (EPA, 2022), the IGI and TII criteria for rating the magnitude and significance of impacts at EIA stage on the geological related attributes are also relevant in determining impact assessment.

The duration of each effect is considered to be either momentary, brief, temporary, short-term, medium term, long-term, or permanent. Momentary effects are considered to be those that last from seconds to minutes. Brief effects are those that last less than a day. Temporary effects are considered to be those which are construction related and last less than one year. Short term effects are seen as effects lasting one to seven years; medium-term effects lasting seven to fifteen years; long-term effects lasting fifteen to sixty years; and permanent effects lasting over sixty years.

The principal attributes (and impacts) assessed include the following:

- Geological heritage sites in the vicinity of the perimeter of the subject site;
- Landfills & industrial sites & graveyards in the vicinity of the site and the potential risk of encountering contaminated ground;
- The quality, drainage characteristics and range of agricultural uses of soil around the site;
- Quarries or mines in the vicinity, the potential implications (if any) for existing activities and extractable reserves;
- The extent of topsoil and subsoil cover and the potential use of this material on site as well or requirement to remove it off-site as waste for disposal or recovery;
- High-yielding water supply springs/wells in the vicinity of the site to within a 2 km radius and the potential for increased risk presented by the proposed development;
- Classification (regionally important, locally important etc.) and extent of aquifers underlying the site perimeter area and increased risks presented to them by the proposed development associated with aspects of the development for example removal of subsoil cover, removal of aquifer (in whole or part), drawdown in water levels, alteration in established flow regimes, change in groundwater quality;
- Natural hydrogeological/karst features in the area and potential for increased risk presented by the activities at the site; and
- Groundwater-fed ecosystems and the increased risk presented by operations both spatially and temporally.

5.2.2 SOURCES OF INFORMATION

Desk-based geological information on the substrata (both Quaternary deposits and bedrock geology) underlying the extent of the site was obtained through accessing databases and other archives where available. Data was sourced from the following:

- Geological Survey of Ireland (GSI) - on-line mapping, Geo-hazard Database, Geological Heritage Sites & Sites of Special Scientific Interest, Bedrock Memoirs and 1: 100,000 mapping;
- Teagasc soil and subsoil database;
- Ordnance Survey Ireland - aerial photographs and historical mapping;
- Environmental Protection Agency (EPA) – website mapping and database information;
- National Parks and Wildlife Services (NPWS) – Protected Site Register; and
- Fingal County Council - illegal landfill information.

Site specific data was derived from the following sources:

- Engineering Services Report- Proposed Residential Development at Ladywell, Balbriggan, Phase 4, Fingal County Council; Paul Mc Grail Consulting Engineers Limited (June 2024).
- Construction Environmental Management Plan- Proposed Residential Development at Ladywell, Balbriggan, Phase 4, Fingal County Council; Paul Mc Grail Consulting Engineers Limited (June 2024).
- Ground Investigations Ireland Ltd. "Ground Investigations Ireland, Taylor Hill Balbriggan (Phase 3) Ground Investigation Report June 2020, Rev B"
- Ground Investigations Ireland Ltd. "Ground Investigations Ireland, Balbriggan Phase 4 Ground Investigation Report June 2024, Rev A"

- The proposed development design site plans and drawings; and Consultation with the project design engineers.
- EPA (2024). EPA Maps.
- GSI (2024). GSI Map Viewer.

5.2.3 RELEVANT LEGISLATION & GUIDANCE

- Environmental Protection Agency (EPA) Advice notes on current practice in the preparation of Environmental Impact Statement (EPA, 2003) and Guidelines on the Information to be contained in Environmental Impact Statements (EPA, 2022a).
- TII/National Roads Authority Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (TII/formerly NRA, 2009).
- Institute of Geologists Ireland (IGI) -Geology in Environmental Impact Statements, a guide (IGI, 2002) and Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (IGI, 2013).
- Water Framework Directive (WFD) - Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy. This relates to the improvement of water quality across Ireland including rivers and groundwater bodies.
- River Basin Management Plan 2018-2021 (including regional plans by Local Authority Waters Programme (Waters and Communities 2020)). Draft River Basin Management Plan 2022-2027.
- Waste Management Acts 1996 as amended;
- European Communities Environmental Objectives (Groundwater) Regulations 2010, S.I. No. 9/2010 (European Communities Environmental Objectives (Groundwater) Regulations 2016);
- European Union Environmental Objectives (Groundwater) (Amendment) Regulations 2016;
- Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration (Groundwater Directive);
- European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019;
- Environment Agency (EA), Land contamination: risk assessment (EA 2020);
- BS 10175:2011 + A2:2017 Investigation of potentially contaminated sites. Code of practice (British Standards Institute 2017);
- CIRIA C552 Contaminated Land Risk Assessment: A Guide to Good Practice (CIRIA 2001);
- Environmental Protection Agency, Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites (EPA 2013);
- Local Authority planning guidance as applicable,
- Consolidated EIA Directive 2011/92/EU and 2014/52/EU.

5.3 BASELINE ENVIRONMENT

The receiving environment is discussed in terms of; land geology, soils, hydrogeology, and site history including potential for contamination.

5.3.1 TOPOGRAPHY AND SETTING

The development site is located approximately 1.5 km east of the Balbriggan district town centre. The Masterplan Phase 4 “Folkstown” site is bound on the south by Clonard Road (regional Route R122), on the east by under construction Phase 3, Boulevard Road and the committed Taylors Hill residential developments (Phase 1 and 2) and on the north by the future development. The subject development is bounded by Bridgefoot Road to the south and west, and Boulevard Road to the southeast and east (respectively) and further east by Taylor Hill Grange Residential Estate. Agricultural land bounds the site to the west and northwest.

Figure 5.1: Site location map (boundary indicated in red)

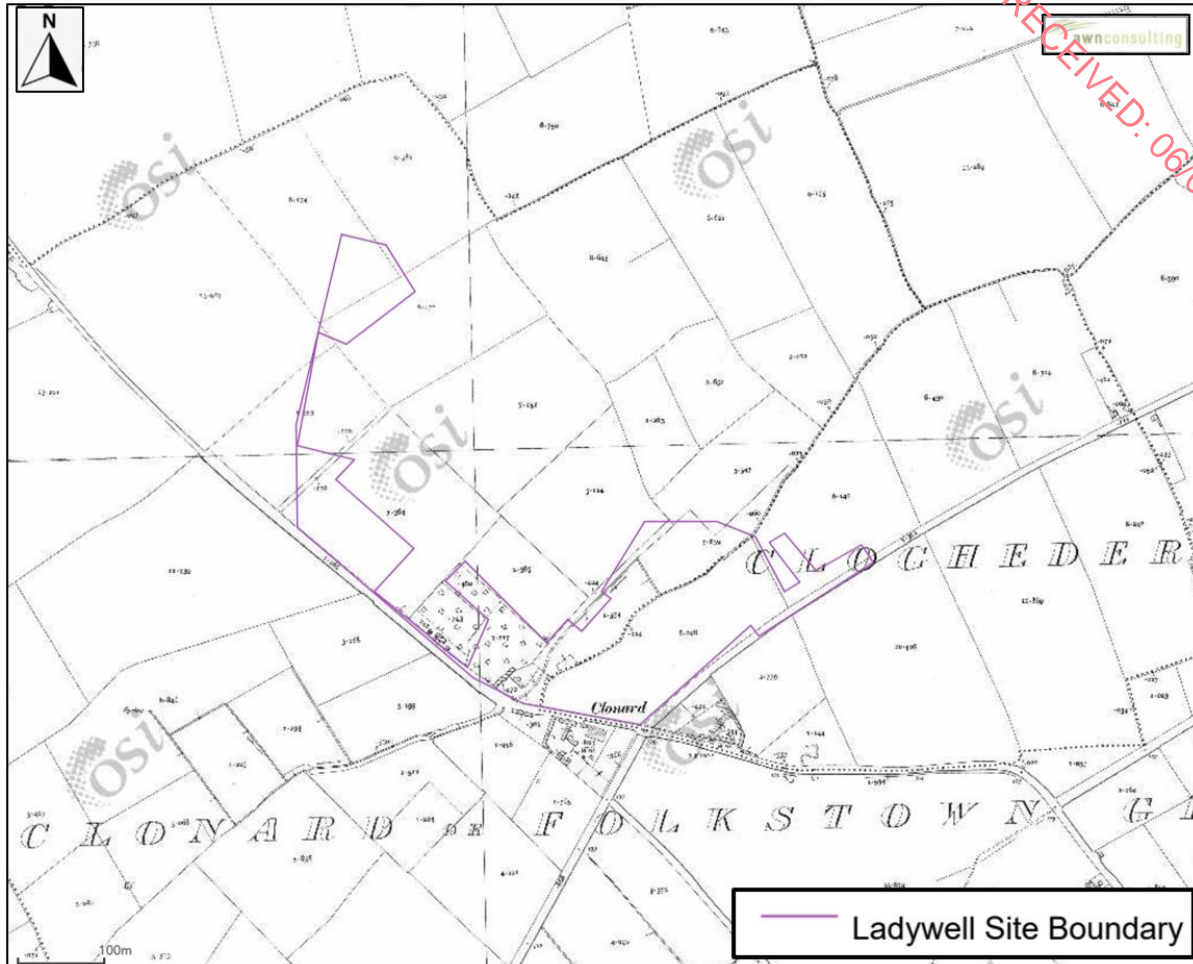
(Source: Google Earth)

The topography is relatively consistent with the site falling in elevation from north-west to south-east and characterized by minor localized undulations. The site slopes from North West 52.15 OD to 34.35 to South East and the gradient varies in the boundary line around 1:20 to 1:50 slope.

5.3.2 AREAS OF GEOLOGICAL INTEREST, HISTORIC & CURRENT LAND-USE

Review of the GSI online database confirmed that no geological heritage site has been identified in the vicinity of the proposed development site. The closest County Geological Site is Laytown to Gormanstown Coastal Plain, including sea cliffs, which is located c. 2.3 km north-northwest of the site at the point of closest proximity.

Further details of the site history and previous land use are included in the Cultural Heritage, Archaeology & Architectural Heritage chapter of this EIAR, prepared by IAC. A review of historical mapping 1829 to current; (source Geohive mapping) shows the land has always been in agricultural use. The development of residential land in the vicinity (east) commenced around 2001. Refer to figure 5.1b below of the 25 Inch B&W (1897-1913) historical mapping.

Figure 5.2: Historical Site location map (boundary indicated in purple)

(Source: [Geohive- https://webapps.geohive.ie/mapviewer/index.html](https://webapps.geohive.ie/mapviewer/index.html))

According to the EPA website, the nearest licenced facility in the vicinity of the site is Padraig Thornton Waste Disposal Limited (IEL facility active licence number P1014-01), which is located circa 1.2 km southeast, thereby hydrogeologically cross gradient of the proposed development.

The IPC Industry (IPPC) site in closest proximity to the development is the Brooks Group Limited Licenced facility (Active License No: P0780-01), which is located approximately 3.8 km south of the subject development site.

5.3.3 SOIL AND QUATERNARY SUBSOIL

The GSI/Teagasc (2024) mapping currently denotes the primary soil type underlying the site as Irish Sea Till (IrSTLPSS) which is derived from parent material described as Sandstone and shale till (Lower Palaeozoic) with matrix of Irish Sea Basin origin. These deposits are classified as AminPD - Mineral poorly drained (Mainly acidic) soils.

The southern portion of the site is partially underlain by localized near-linear strip of Alluvium (undifferentiated), which lines the banks of the Clonard Brook Stream (EPA Name: CLONARD_or_FOLKSTOWN_GREAT) which flows in a northeast-east direction traversing the site.

Figure 5.3 below presents the soil type predominantly covering the site and the surrounding area.

Figure 5.3: Soils Map for the Proposed Development site



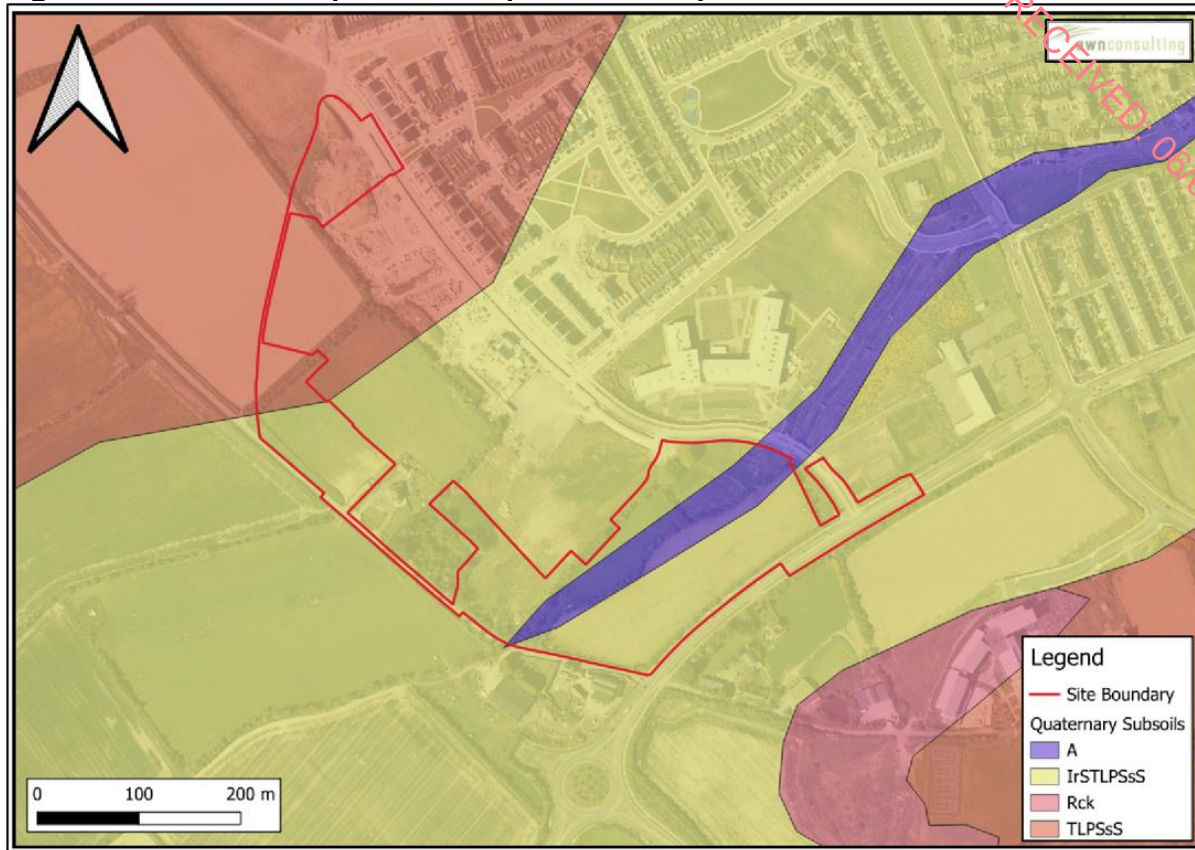
(boundary indicated in red) (Source: www.gsi.ie)

The regional overburden deposits are reflective of the Quaternary geological period that extends from around 1.5 million years ago to the present day. This can be further sub-divided into the Pleistocene Epoch, which covers the Ice Age period, and which extended up to 10,000 years ago and the Holocene Epoch, which extends from that time to the present day.

The GSI/ Teagasc (2024) mapping database of the quaternary subsoils in the vicinity of the site indicates one (1) no. principal subsoil type. The predominant subsoil type present across the site is Till derived from Lower Palaeozoic sandstones and shales (TLPSSs). This till is made up of glacial CLAYs which are less permeable than alluvium subsoils indicated in the southern portion of the site adjacent to the onsite stream / watercourse.

The GSI (2024) does not indicate any bedrock outcrops within the proposed site boundary or in the wider vicinity.

Figure 5.4 below illustrates the subsoil types found within and surrounding the site.

Figure 5.4: Subsoils Map for the Proposed Development site

(boundary indicated in red) (Source: www.gsi.ie)

The GSI/Teagasc (2024) mapping currently denotes the primary soil type underlying the site as Irish Sea Till (IrSTLPSsS) which is derived from parent material described as Sandstone and shale till (Lower Palaeozoic) with matrix of Irish Sea Basin origin. Alluvium deposits are identified in close proximity to the onsite Clonard Brook stream (GSI, 2024)

The predominant subsoil type present across the site is Till derived from Lower Palaeozoic sandstones and shales (TLPSsS). This till is made up of glacial CLAYs which are less permeable than alluvium subsoils indicated in the southern portion of the site adjacent to the onsite stream / watercourse.

5.3.3.1 2024 Site Investigations

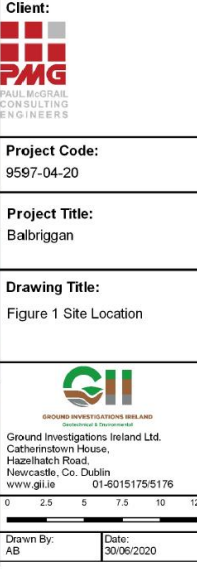
A site investigation (S.I) was carried out by Grounds Investigations Ireland Ltd. (GII) in March 2024 (contained in Appendix C Volume III of the EIAR) which undertaken included the following:

- 2 No. Soakaways to determine a soil infiltration value to BRE digest 365
- 3 No. Cable Percussion boreholes to a maximum depth of 3.10m BGL
- Installation of 2 No. Groundwater monitoring wells
- Geotechnical & Environmental Laboratory testing

Phase 4 Development

LEGEND

- CP Borehole
- Soakaway
- Trial pit
- Surface Water Sample
- RC Borehole



e shown in Table 5.1.

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e Made / with a gravel lenses nesive 1.0m ome, n the

Name	Depths/ Notes
Granular Deposits	There were no granular deposits were encountered onsite during this ground investigation.
Presumed Boulders or Bedrock	The Boreholes (BH01, BH01A, and BH02) were terminated between the depth range of 2.10--3.10m BGL due to obstruction caused by boulder or bedrock.

(IGSL, Ground Investigation report, 2024)

5.3.3.2 2020 Site Investigations

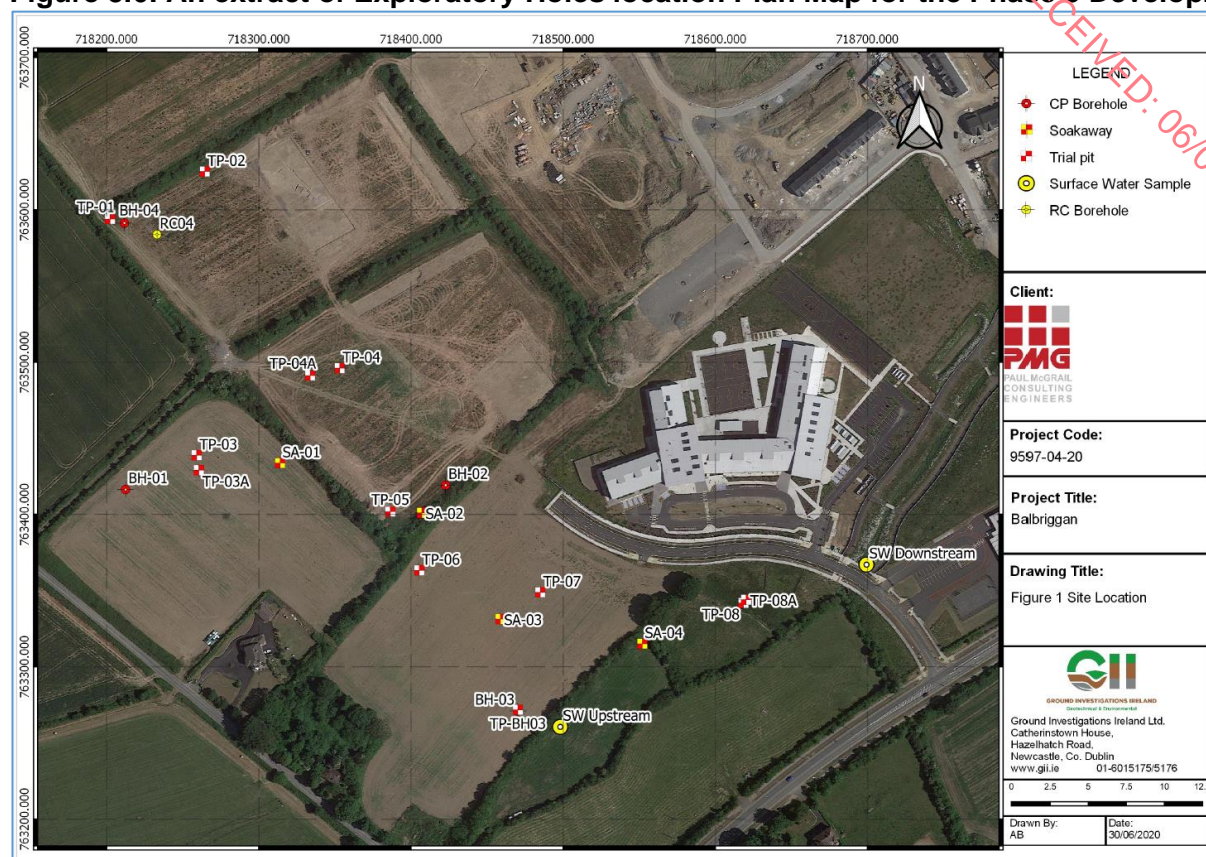
A site investigation (S.I) was undertaken between February and April 2020 to assess the lands which the Phase 3 of this Residential Development (Balbriggan) occupy and collate / tabulate data to subsequently allow the production of a ground model for risk assessment purposes. included the area of the proposed development. The report entitled "Ground Investigations Ireland, Taylor Hill Balbriggan (Phase 3) Ground Investigation Report June 2020, Rev B" details the works completed. This report is contained in Appendix C Volume III of this EIA report:

The site investigation comprised:

- 8No. trial pits to a maximum depth of 3.00m BGL,
- 4 no. cable percussive boreholes to a maximum depth of 9.0m BGL and a rotary borehole to depth 8.0m BGL.
- 3 no. groundwater monitoring installations were constructed at boreholes BH02, BH03 and RC04

Of the subject exploratory holes produced, BH01, BH04, TP-08, and RC04 are located at / within the development boundary for this Balbriggan Phase 4 of the residential development, while BH03 is located directly adjacent to the phase 4 redline boundary (refer to figure 5.4 below). The remainder of the exploratory points occupy the proximal lands in adjacent fields.

Discrete quantities of sandy gravelly reworked Clay were encountered in trial pits TP01, TP02, TP04, TP04A, TP05 and TP06, all of which are either within or in close proximity the phase for boundary associated with this EIAR.

Figure 5.6: An extract of Exploratory Holes location Plan Map for the Phase 3 Development

(Source: GII, 2020)

5.3.4 SOIL QUALITY AND ANALYSIS

5.3.4.1 Soil Guidelines

For this analysis, the soil results were compared to the Generic Assessment Criteria (GAC) (The LQM/CIEH S4ULs for Human Health Risk Assessment, 2015) concentrations. The GAC is derived to be protective of human health and ecology for a residential end use, as detailed in above soil guidelines section above. There are no legislated threshold values for soils in Ireland. As such soil samples were compared to a Generic Assessment Criteria (GAC) derived to be protective of human health, water bodies (including groundwater) and ecology for a residential end use.

Generic Assessment Criteria in the UK has been derived using the Contaminated Land Exposure Assessment (CLEA) model to be protective of human health for multiple different land uses. LQM (Land Quality Management) and the CIEH (Chartered Institute of Environmental Health) developed a document in July 2009 detailing their own research and derivation of their own 'LQM GACs'. LQM GACs were derived for a total of 82 substances including many organic substances for the standard land uses of residential, commercial/industrial and allotments. This was updated in 2015 following further research and the derived results are now called LQM/CIEH Suitable 4 Use Level (S4UL). The LQM/CIEH S4ULs are intended for use in assessing the potential risks posed to human health by contaminants in soil and as transparently derived and cautious "trigger values" above which further assessment of the risks or remedial action may be needed. For each contaminant S4ULs have been derived for six land use scenarios based on assessing exposure pathways in each planning scenario. In this instance the commercial scenario has been considered. Soil type and soil organic matter (SOM) has an influence on the behaviour of contaminants. S4ULs have been derived for three SOM contents (1%, 2.5% and 6%) to cover the likely range in soils. A prudent approach has been taken by considering the lower 1% SOM content. At this lowest 1% SOM

content lower S4AL “trigger values” are presented, as there is less potential for remediation of contaminants through microorganisms and humic substances associated with SOM.

The UK values do not have any legal standing within the Republic of Ireland and no statutory guidance for assessing the significance of soil contamination currently exists. However, the values do provide a means of placing the data within context when considering magnitude of risk and have been used in that capacity for this assessment.

5.3.4.2 Soil Quality

During the Ground investigation undertaken by GII (2024), samples were selected from the exploratory holes for a range of geotechnical and environmental testing to assist in the classification of soils and for laboratory analysis focusing on potential contamination and the classification of the materials for waste disposal purposes. Environmental & Chemical testing was carried out by Element Materials Technology Laboratory in the UK. The pH and sulphate testing completed on samples recovered from the exploratory holes indicates the pH results are near neutral and the sulphate results are low, when compared to the guideline values from BRE Special Digest 1:2005.

Laboratory analysis was carried out on two (No. 2) soil samples recovered from trial pits TP01 and TP07 at depths 0.5mbgl and 0.7mbgl respectively in February 2020 (in association with Phase 3) and further soil samples were then recovered from trial pits TP03A, TP04A, TP06A and BH03 between the depth range 0.5 and 1.5m bgl in May 2020 (GII, 2020). 6 No. soil samples recovered from between 0.5 and 1.50m depth were analysed for a range of various parameters. The parameter list for the suite includes analysis of the solid samples for arsenic, barium, cadmium, chromium, copper, cyanide, lead, nickel, mercury, zinc, speciated aliphatic and aromatic petroleum hydrocarbons, pH, sulphate, sulphide, moisture content, soil organic matter and an asbestos screen. The suite also includes those parameters specified in the EU Council Decision establishing criteria for the acceptance of waste at Landfills (Council Decision 2003/33/EC), which for the solid samples are total organic carbon (TOC), speciated aliphatic and aromatic petroleum hydrocarbons, BTEX, phenol, polychlorinated biphenyls (PCB) and PAH.

The parameters name, chemical formula / abbreviations are listed below:

- Diesel Range Organics (DRO);
- Mineral Oil;
- Total Petroleum Hydrocarbons Criteria Working Group (TPH CWG);
- Metals (As, Cd, Cr, Pb, Se, Cu, Ni, and Zn);
- Polychlorinated Biphenyls (PCB);
- Volatile Organic Compounds (VOC);
- Semi Volatile Organic Compounds (SVOC); and
- Waste Acceptance Criteria (WAC) for inert waste landfills in accordance with the 2002 European Landfill Directive (2002/33/EC).

This suite of parameters includes the following:

- Mineral oil;
- Polycyclic aromatic hydrocarbons (PAHs);
- Polychlorinated biphenyls (PCBs);
- BTEX compounds (benzene, toluene, ethylbenzene, and xylenes);
- and methyl tert-butyl ether (MTBE);
- Total organic carbon (TOC);
- Leachable component of a range of organic and inorganic parameters.

Soil sample analysis results are presented in the GII Ground Investigation Report (2020), attached to this report as **Appendix C Volume III of the EIAR**.

5.3.4.3 Summary of Soil Analysis

Generally, the soil results were at or below the limit of detection for most parameters and which was generally below the relevant generic assessment criteria. The exception to this was metals, with multiple metals being detected in concentrations above the LOD, none exceeded the GAC. All soil samples analysed also were checked for asbestos fibres. In this instance these laboratory detection limits are significantly below any concentration that would cause harm to a receptor.

In line with the historic use and function of the site for agricultural purposes, there was no evidence of contamination noted in during site investigation.

Heavy Metals

All heavy metal parameter concentrations recorded in the soil samples are below the most conservative threshold value for the LQM/CIEH for HHRA (Human Health Risk Assessment) Residential Threshold at 1% SOM. See **Appendix C Volume III of the EIAR**.

Volatile Organic Compounds (VOCs) & Semi Volatile Organic Compounds (SVOCs)

There were no exceedances recorded when VOC and SVOC concentrations in the soil samples were compared to the most conservative threshold i.e., LQM/CIEH for HHRA Residential Threshold at 1% SOM. See **Appendix C Volume III of the EIAR**.

Total Petroleum Hydrocarbons Criteria Working Group (TPH CWG)

All TPH CWG parameters recorded were below the laboratory's limit of detection (LOD). As such, there are no exceedances recorded when these concentrations were compared to the most conservative threshold i.e., LQM/CIEH for HHRA Residential Threshold at 1% SOM.

Polychlorinated Biphenyls (PCBs)

All parameters recorded were below the laboratory's LOD. As such, there are no exceedances recorded when these concentrations were compared to the most conservative threshold i.e., LQM/CIEH for HHRA Residential Threshold at 1% SOM.

Polycyclic Aromatic Hydrocarbons (PAHs)

All parameters recorded were below the LOD. As such, there are no exceedances recorded when these concentrations were compared to the most conservative threshold i.e., LQM/CIEH for HHRA Residential Threshold at 1% SOM.

Waste Acceptance Criteria (WAC) Analysis

During the site Investigations carried out by Grounds Investigations Ireland Ltd, 2 shallow soil samples were collected from trial pits TP01 and TP07 which are within and on adjacent land to the subject site boundary (Phase 4), respectively. These samples were analysed for their compliance to the criteria set out in the 2002 European Landfill Directive (2003/33/EC) which established criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002).

All, including those carried out on site of proposed development proved compliant in accordance with Soil Waste Acceptance Criteria (WAC) – Classification for Disposal, the GII Report classifies soil quality as *Inert / non-hazardous*. Therefore, the samples featured would be accepted by an inert landfill (refer to **Appendix C Volume III of the EIAR**). The WAC comparison table is also present in **Appendix C Volume III of the EIAR**. This Table also explains the different classifications and categories set out by the adopted EU Council Decision 2003/33/EC.

Asbestos

There were no asbestos fibres identified / detected in any of the soil samples which were tested for the presence of asbestos. Please refer to the standalone Ground Investigation Report (2020) prepared by Ground Investigation Ireland and submitted as part of the application (see **Appendix C Volume III of the EIAR**).

5.3.5 REGIONAL GEOLOGY

Inspection of the available GSI mapping (GSI, 2024) shows bedrock geology underlying the site belongs to one formation: BECP – Belcamp Formation consisting of 'Andesite, pillow breccia, mudstone, tuff'. This volcanic (partial) formation is described as Basalt to andesite sheets, pillow breccias and hyaloclastite, tuffs and mudstones. A lower mudstone and tuff-dominant Lowther Lodge Member and an upper pillow breccia and andesite dominant Bremore Member.

In terms of the structural geology of the area, the GSI database shows a structural fault traversing the northwest portion / section of the site which trends in a North-South direction / orientation (Refer to figure 5.7 below).

According to the GII Ground Investigation undertaken in 2020 on the adjacent/neighbouring and overlapping lands (intersecting Site Boundaries) occupied by the Phase 3 residential development, borehole, BH04 was drilled in the northern portion of the Phase 4 Site Boundary (this EIA) proposed and encountered bedrock at 2.1m BGL (subsequently, terminated at this depth). A rotary borehole referred to as RC04 was drilled in the vicinity of borehole BH04 to a depth of 8.0m BGL. It also encountered bedrock at 2.0m BGL. Borehole, BH01 terminated at 4.10m BGL due to obstruction by what was presumed to be bedrock.

Figure 5.7: Bedrock Geology Map



(Source: www.gsi.ie)

5.3.6 HYDROGEOLOGY

5.3.6.1 Description of Water Body

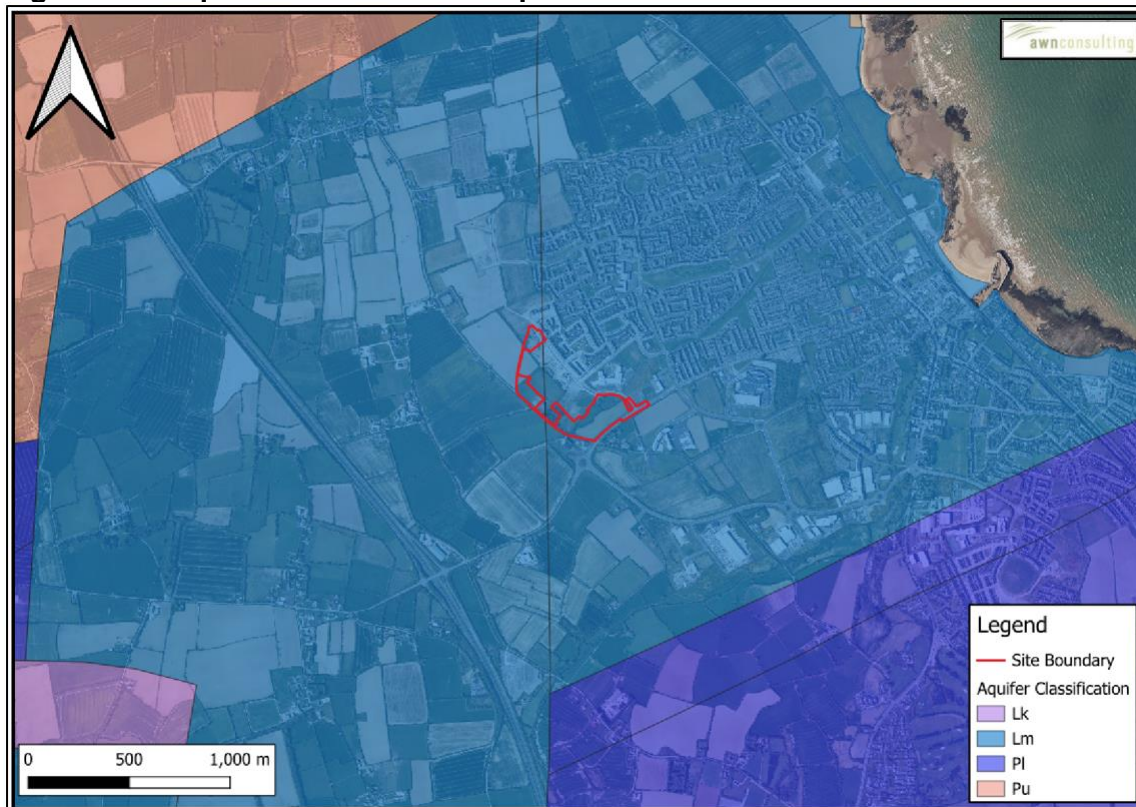
The GSI has devised a system for classifying the bedrock aquifers in Ireland. The aquifer classification for bedrock depends on a number of parameters including, the area extent of the aquifer (km^2), well yield (m^3/d), specific capacity ($\text{m}^3/\text{d}/\text{m}$) and groundwater throughput (mm^3/d). There are three main classifications: regionally important, locally important, and poor aquifers. Where an aquifer has been classified as regionally important, it is further subdivided according to the main groundwater flow regime within it. This sub-division includes regionally important fissured aquifers (Rf) and regionally important karstified aquifers (Rk). Locally important aquifers are sub-divided into those that are generally moderately productive (Lm) and those that are generally moderately productive only in local zones (LI). Similarly, poor aquifers are classed as either generally unproductive except for local zones (PI) or generally unproductive (Pu).

The bedrock aquifer underlying the site according to the GSI (www.gsi.ie/mapping) National Bedrock Aquifer Map is classified as (LM) *Locally Important Aquifer - Bedrock which is Generally Moderately Productive in local zones*.

The site is underlain by the Balbriggan Groundwater Body (EU code: IE_EA_G_039). Based on the most recent data (www.epa.ie) the Balbriggan GWB for which the Proposed Development is located entirely within, has a WFD status of “Good” (2016-2021) and has obtained a WFD risk score (3rd-cycle) of “Not At Risk”.

In addition, groundwater source protection zones, which are zones defined by the GSI within which development is limited in order to protect groundwater from potential pollution, are not identified by the GSI under / beneath the site or in the immediate adjacent lands / vicinity. There are no karst features in the area.

Figure 5.8: Aquifer Classification Map



(Source : www.gsi.ie)

Aquifer vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated generally by human activities. Due to the nature of the flow of groundwater through bedrock in Ireland, which is almost completely through fissures/ fractures, the main feature that protects groundwater from contamination, and therefore the most important feature in the protection of groundwater, is the subsoil (which can consist solely of/ or of mixtures of peat, sand, gravel, glacial till, clays, or silts).

Groundwater Vulnerability is a term used to represent the natural ground characteristics that determine the ease with which groundwater may be contaminated by human activities. The GSI currently classifies the aquifer vulnerability within the subject site as a mixture of *High (H)*, *Moderate (M)*, and *Low* based on GSI (2024) data. The GSI (2024) does not indicate any bedrock outcrops within the proposed site boundary or in the immediate vicinity.

Table 5.2: Vulnerability Mapping Guidelines

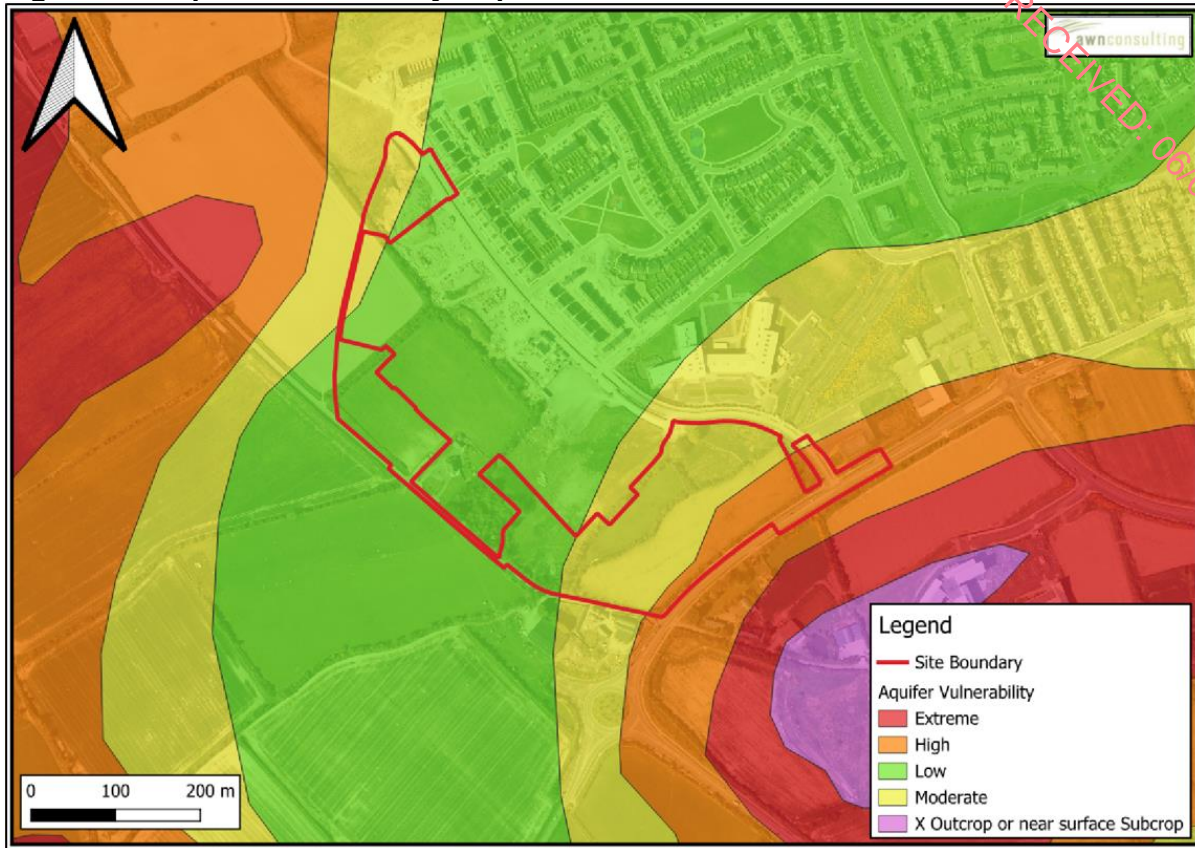
Vulnerability Rating	Hydrogeological Condition				
	Subsoil Permeability (type) and Thickness			Unsaturated Zone	Karst Features
	High Permeability (sand/gravel)	Moderate Permeability (e.g. sandy subsoil)	Low Permeability (e.g. clayey subsoil, clay, peat)	(Sand/ gravel aquifers only)	(<30 m radius)
Extreme (E)	0 - 3 m	0 - 3 m	0 - 3 m	0 - 3 m	-
High (H)	> 3 m	3 - 10 m	3 - 5 m	> 3 m	n/a
Moderate (M)	n/a	> 10 m	5 - 10 m	n/a	n/a
Low (L)	n/a	n/a	> 10 m	n/a	n/a

Notes: (1) n/a: Not applicable
 (2) Precise permeability values cannot be given at present
 (2) Release point of contaminants is assumed to be 1-2 below ground surface

According to the GII Ground Investigation undertaken in 2020, BH04 was drilled in the northern portion of the Phase 4 Site Boundary (this EIA) proposed and encountered bedrock at 2.1m BGL (subsequently, terminated at this depth), while a rotary borehole referred to as RC04 was drilled in the vicinity of borehole BH04 to a depth of 8.0m BGL and also encountered bedrock at 2.0m BGL. Both of these findings are inconsistent with the overburden thickness shown by the GSI Aquifer Vulnerability mapping Database (2024) which classifies this area as having low to moderate Vulnerability, thereby indicating 5-10 m and >10 m of low permeability overburden thickness, respectively.

Similarly, BH01 which occupies the central portion of the site is located in the low vulnerability zone which indicates >10m of low permeability overburden. BH01 terminated at 4.10m BGL due to obstruction by what was presumed to be bedrock, in which case the site data recorded in relation to overburden thickness /depth to bedrock is not consistent and does not align with the GSI vulnerability classifications zones in this area.

Refer to table 5.2 above and Figure 5.9 below

Figure 5.9: Aquifer Vulnerability Map

5.3.7 GROUNDWATER WELLS AND FLOW DIRECTION

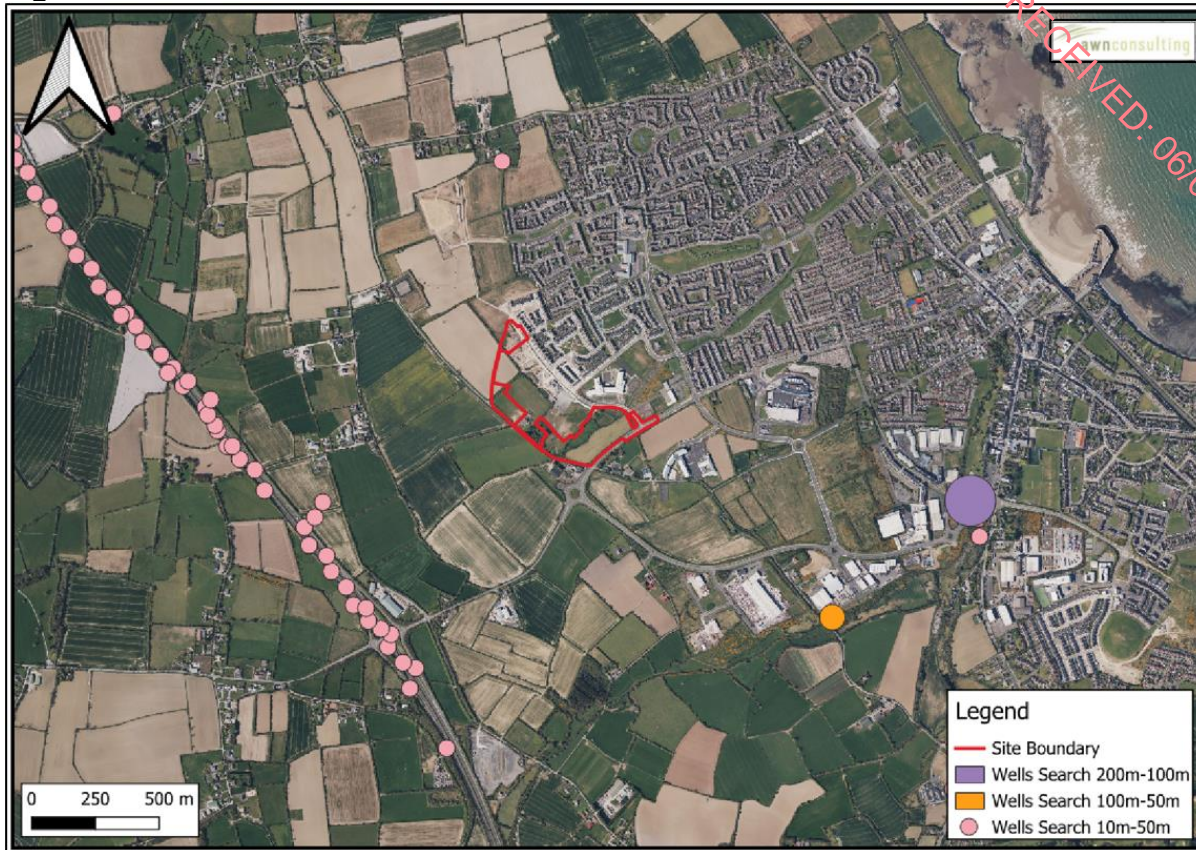
The GSI Well Card Index is a record of wells drilled in Ireland, water supply and site investigation boreholes. It is noted that this record is not comprehensive as licensing of wells is not currently a requirement in the Republic of Ireland. It is noted that this record is not comprehensive as licensing of wells is not currently a requirement in ROI. This current index does not show any wells drilled and springs at the site. There are no wells in the immediate vicinity of the site while several wells occupy the wider region. The well in closest proximity to the site is a Borehole (2925NEW087) located approximately 1.1 km southeast of the site. Multiple boreholes with a good yield and used for industrial use are located in the Balbriggan region to the east of the site. The balance of the boreholes to the west and southwest are characterised by a public supply function / use. There is no risk to these water supplies from the site.

The area is serviced by public mains therefore it is unlikely that any wells are used for potable supply. There are no recorded groundwater resource protection zones in the immediate area of the proposed site, i.e., zones surrounding a groundwater abstraction area. The Public Supply Source Protection Area in closest proximity to the proposed development site is BOG OF THE RING PWS which is located approximately 2.1 km southwest of the site.

None of the wells listed are categorised as domestic use. The area is serviced by Local Authority / public mains therefore it is unlikely that any wells are used for potable supply.

Regional groundwater flow would most likely be in line with local topography to the east towards the Balbriggan coastline and Irish Sea. The flow direction in the overburden generally follows no fixed pattern or trend.

Figure 5.10 below presents the GSI well search for the area surrounding the site.

Figure 5.10: GSI Well Search

(GSI, 2024)

5.3.8 GROUNDWATER QUALITY

The European Communities Directive 2000/60/EC established a framework for community action in the field of water policy (commonly known as the Water Framework Directive [WFD]). The WFD required 'Good Water Status' for all European water by 2027, to be achieved through a system of river basin management planning and extensive monitoring. 'Good status' means both 'Good Ecological Status' and 'Good Chemical Status'.

The Groundwater Body (GWB) underlying the site is the Balbriggan GWB (EU Groundwater Body Code: IE_EA_G_039). Currently, the EPA (2024) classifies the Balbriggan GWB as having 'Good Status', as per the last WFD cycle (2016-2021). Presently, the groundwater body in the region of the site (Dublin GWB) is classified as being 'Not at risk' per the WFD Risk Score system which determines that the GWB has achieved its objectives.

Following the previously mentioned GII Ground Investigation in 2020 on adjacent and adjoining lands, Groundwater analysis was undertaken on three samples recovered from Boreholes as analysis for the adjacent Phase 3 development: Exploratory holes from which samples were collected in April and May 2020 include; BH02, BH03 and BHRC04. The parameters and their respective concentrations were compared to either EC Environmental Objectives (Groundwater) 2010 as amended S.I. No. 366 /2016 , Schedule 4 & 5 (referred to below as GW) or in the absence of these to the EU Drinking Water Regulation's as amended 2017 (referred to in the table below as DW). IGV is Interim Guideline Value as set by the Irish Environmental Protection Agency (EPA).

The subsequent findings are summarized as:

- Concentrations of Aluminium and Iron were exceeding the standard. Both exceedances were derived from a sample from borehole BHRC04, while the two other samples from boreholes BH02 and BH03 were significantly below the relevant standards.
- BHRC04 detected slightly elevated concentrations of polycyclic aromatic hydrocarbons. Borehole RC04 represents an outlier in terms of site groundwater quality as the other two locations tested to the centre and south of the site displayed good groundwater quality.
- The total coliform count was not acceptable for drinking water but the groundwater at the site will not be consumed by future residents.
- All other parameters were not detected above either the Limit of Detection (LOD) or Standards listed above.

Table 5.3: Groundwater Generic Screening Level Risk Assessment (JSA, EIAR Vol. II)

Determinant	Minimum Groundwater Concentration	Maximum Groundwater Concentration	Average groundwater Concentration	General Assessment Criteria (mg/kg)	GAC Type	Falls below GAC Yes/No
Arsenic	<2.5ug/l	<2.5ug/l	<2.5ug/l	7.5ug/l	GW	Yes
Aluminium	20ug/l	906ug/l	315ug/l	150ug/l	GW	No
Barium	24ug/l	46ug/l	37.3ug/l	0.1mg/l	IGV	Yes
Boron	30ug/l	50ug/l	39.3ug/l	750ug/l	GW	Yes
Calcium	90.9mg/l	127.9mg/l	112.43mg/l	200mg/l	IGW	Yes
Chromium	<1.5ug/l	9.4ug/l	4.1ug/l	37.5ug/l	GW	Yes
Iron	<20ug/l	916ug/l	318.6ug/l	200ug/l	DW	No
Lead	<5ug/l	<5ug/l	<5ug/l	18.75ug/l	GW	Yes
Mercury	<1ug/l	<1ug/l	<1ug/l	0.75ug/l*	GW	Yes
Magnesium	8.3mg/l	15.2mg/l	11.83mg/l	150mg/l	IGV	Yes
MTBE	<5ug/l	<5ug/l	<5ug/l	30ug/l	IGV	Yes
TPH (CWG) Aromatics/Aliphatics	<10ug/l	<10ug/l	<10ug/l	No standard but all results below method of detection level		
Total Polycyclic Aromatic Hydrocarbons	0.195ug/l	0.649ug/l	0.35ug/l	0.075ug/l	GW	No
Total Speciated Phenols	<0.1mg/l	<0.1mg/l	<0.1mg/l	0.5ug/l**	IGV	Yes
Sulphate	20.9mg/l	74.4mg/l	52.56mg/l	187.5mg/l	GW	Yes
Nitrate	5.0mg/l	20.8mg/l	12.13mg/l	37.5mg/l	GW	Yes
Ammoniacal Nitrogen	0.05mg/l	0.23mg/l	0.15mg/l	No Standard		
Sulphide	<0.01mg/l	<0.01mg/l	<0.01mg/l	No standard but all results below method of detection level		
Hexavalent Chromium	<0.006ug/l	<0.006ug/l	<0.006ug/l	No standard but all results below method of detection level		
Dissolved Oxygen	4mg/l	7mg/l	6mg/l	No standard assessed as a trend over time		
pH	7.66	7.96	N/A	EPA Interim Guideline Value (IGV 6.5 – 9.5 units of pH)		
TOC	<2mg/l	<2mg/l	<2mg/l	No Standard		
Total Coliforms	10CFU/100ml	<100CFU/100ml	N/A	0	DW	No
Total Dissolved Solids	386mg/l	489mg/l	437mg/l	1000	IGV	Yes

*The results for Mercury and Total Speciated Phenols are all at the method of detection which is above the GW standard. It is likely that the standard is met.

5.3.8.1 Hydrogeological Features

According to the GSI Karst database there is no evidence of karstification (bedrock prone to dissolution leading to underground drainage systems such as caves and large crevices) in this area. This would not be expected in this rock type.

5.3.8.2 TII Methodology

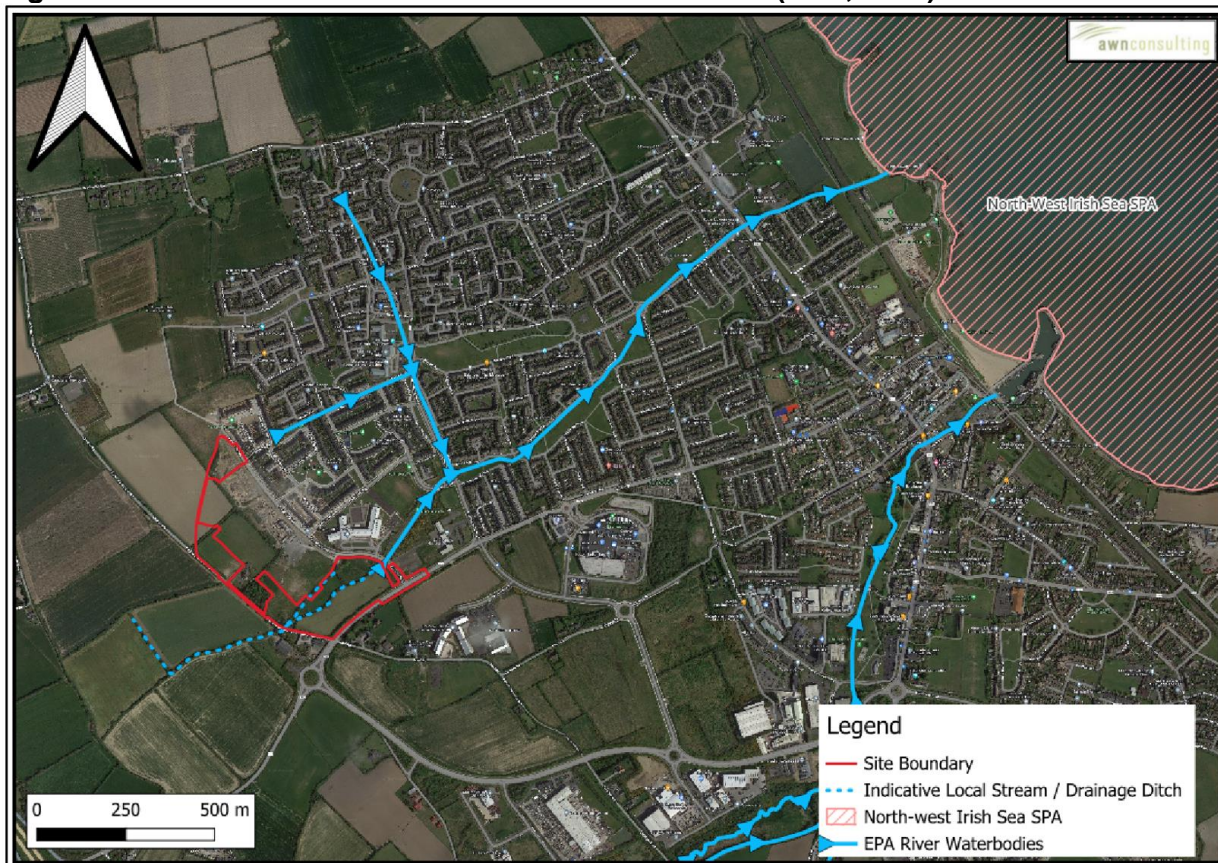
Based on the TII methodology, the criteria for rating site importance of geological and hydrogeological features, the importance of the features at this proposed development site is rated as *Low Importance*. This is based on the assessment that the attribute has a low-quality significance or value on a local scale (refer to **Appendix C - 5.1 Volume III of the EIAR**).

5.3.9 AREAS OF CONSERVATION

There are no Special Protection Areas, candidate Special Areas of Conservation or proposed Natural Heritage Areas within or immediately adjacent to the facility. The nearest site designated for nature conservation is the North-West Irish Sea SPA (Site Code 004236), which is located approximately 2.1 km to the east. There are no groundwater dependent wetlands within the zone of influence (or downstream) of the proposed development.

The proposed development would have an indirect hydrogeological connection with North-West Irish Sea SPA via the aquifer underlying the site. **Figure 5.11**, below, presents the location of this protected area in the context of the proposed development site.

Figure 5.11: Natura 2000 and conservation areas / sites (EPA, 2024)



5.3.10 RADON

According to the EPA (now incorporating the Radiological Protection Institute of Ireland) the site location is in a Radon Zone Area where it is estimated that more than twenty per cent of the homes in this 10km grid square are estimated to be above the Reference Level (source: <https://gis.epa.ie/EPAMaps/>, EPA Mapping Database Radon Map- Pre-May 2022, accessed: 2024). Buildings in this area will require the implementation of radon protective measures. This is a High Radon Area, indicating that About 1 in 20 homes in this area is likely to have high radon levels in this area.

5.3.11 GEOHAZARDS

Much of the Earth's surface is covered by unconsolidated sediments which can be especially prone to instability. Water often plays a key role in lubricating slope failure. Instability is often significantly increased by man's activities in building houses, roads, drainage, and agricultural changes. Landslides, mud flows, bog bursts (in Ireland) and debris flows are a result. In general, Ireland suffers few landslides. Landslides are more common in unconsolidated material than in bedrock, and where the sea constantly erodes the material at the base of a cliff and leads to recession of the cliffs. Landslides have also occurred in Ireland in recent years in upland peat areas due to disturbance of peat associated with construction activities. There have been no recorded landslide events at the site. The GSI landslide database was consulted and the nearest landslide to the Proposed Development was approximately 17.7 km to the northwest, referred to as a rotational slide within sandstone and shale till (Lower Palaeozoic) (GSI_LS12_0335). The date of this landslide event is unknown. Due to the local topography and the underlying strata, there is a negligible risk of a landslide event occurring at the site.

In Ireland, seismic activity is recorded by the Irish National Seismic Network operated by the Geophysics Section of the School of Cosmic Physics at the Dublin Institute for Advanced Studies (DIAS) which has been recording seismic events in Ireland since 1978. The station configuration has varied over the years. However, currently there are five permanent broadband seismic recording stations in Ireland operated by DIAS. The seismic data from the stations comes into DIAS in real-time and is studied for local and regional events. Records since 1980 show that the nearest seismic activity to the proposed location was in the Irish Sea (1.0 – 2.0 MI magnitude) and ~50 km to the south in the Wicklow Mountains. There is a very low risk of seismic activity to the proposed development site.

There are no active volcanoes in Ireland so there is no risk from volcanic activity.

5.3.12 LAND TAKE

There will be a loss of land available for greenfield/agricultural use due to the development. However, the area of development is relatively small in the context of agricultural land available in the overall region. This change of land use has already been established for the permitted zone of residential development.

5.3.13 CONCEPTUAL SITE MODEL

Based on the regional and site-specific information available the type of Geological / Hydrogeological Environment as per the IGI Guidelines is:

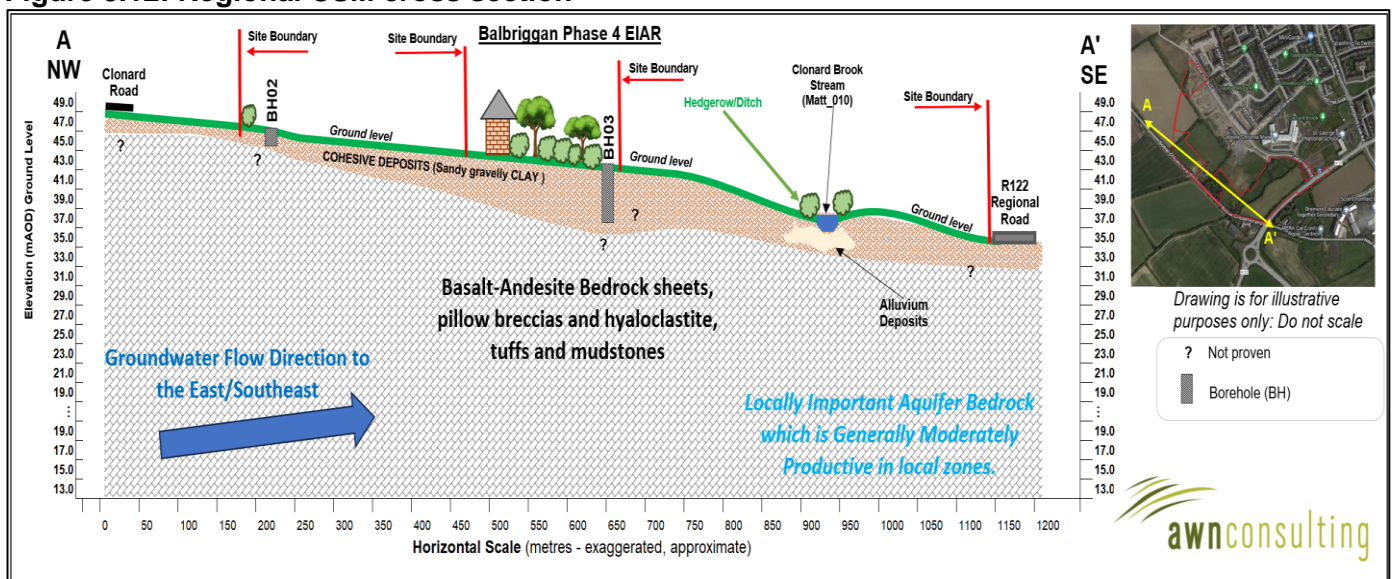
Type A – Passive geological/hydrogeological environment.

Figure 5.12 presents the location of representative cross sections through the site to show the local hydrogeology conceptual site model (CSM) which is as follows:

- The site slopes from North West 52.15 OD to 34.35 to South East and the topography is characterized by minor localised undulations
- The proposed development site has been greenfield/agricultural use historically. There is no evidence of any historical waste disposal or source of contamination. WAC testing has confirmed that the soil can be considered “inert” for disposal purposes and all soil samples analysed were suitable for residential development.
- The profile on site is relatively consistent and comprises:
 - Soil Type: Cohesive Deposits consisting of sandy Gravelly CLAY. The GSI/Teagasc (2024) mapping currently denotes the primary soil type underlying the site as Irish Sea Till (IrSTLPSsS) which is derived from parent material described as Sandstone and shale till (Lower Palaeozoic) with matrix of Irish Sea Basin origin. Alluvium deposits are identified in close proximity to the onsite Clonard Brook stream (GSI, 2024)

- Overburden: The predominant subsoil type present across the site is Till derived from Lower Palaeozoic sandstones and shales (TLPSSs). This till is made up of glacial CLAYs which are less permeable than alluvium subsoils indicated in the southern portion of the site adjacent to the onsite stream / watercourse.
- Underlain by Bedrock:
- 'Andesite, pillow breccia, mudstone, tuff which is considered a (LM) *Locally Important Aquifer - Bedrock which is Generally Moderately Productive in local zones*. The depth to bedrock varies within the phase 4 site boundary from 2.1m BGL to a maximum of 4.1 BGL as evident from GII Ground Investigation undertaken for the Phase 3 residential development (2020).
- Review of the geology and hydrogeology in the surrounding region indicates that there are no sensitive receptors such as groundwater-fed wetlands, significant public water supplies/ Group Water Schemes or geological heritage sites within the immediate vicinity which could be impacted by the proposed development;
- Groundwater flow direction is east towards the Irish Sea;

Figure 5.12: Regional CSM cross section



5.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The development will consist of the construction of 197 residential units / dwellings, 2 no. commercial units, ancillary infrastructure and services (attenuation, foul sewer, surface water), as well as public open spaces for the overall Phase 4. The subject lands are characterized by an agricultural function with a combined area of c. 7.15 hectares at Folkstown in Balbriggan, North Co. Dublin. It is proposed to construct a new residential development with associated services, access roads and car parking at the proposed site. The proposed construction is envisaged to consist of conventional foundations and pavement make up with some local excavations for services and plant. The development site is greenfield, characterized by a history agricultural function / land use.

5.4.1 CONSTRUCTION PHASE

The key civil engineering works which relate to the land, soil geology, and Hydrogeological environment during construction of the proposed development are summarised below:

- During the construction phase, excavated topsoil and subsoil and stones (c. 20,527.21 m³) will be generated from the excavations required to facilitate site levelling to the necessary base level and construction of new foundations. It is anticipated that c. 4925.13 m³ will be reused on site. It is

anticipated that c. 15,602.08 m³ of excavated material will need to be removed off site at a fully authorised soil recovery facility.

- Storage of aggregate materials such as sands and gravels will be stored in clearly marked receptacles in a secure compound area within the contractors' compound on site. Temporary storage of spoil will be managed to prevent accidental release of dust and uncontrolled surface water run-off which may contain sediment and solid matter. Any excavated material temporarily stockpiled onsite for re-use during reinstatement will be managed to prevent accidental release of dust and uncontrolled surface water run-off which may contain sediment etc;
- Temporary storage of fuel required for on site for construction traffic. Liquid materials i.e., fuel storage will be located within temporary bunded areas, doubled skinned tanks or bunded containers (all bunds will conform to standard bunding specifications - BS8007-1987) to prevent spillage;
- There will be a requirement for deliveries of imported engineering fill (sands and gravels), and other construction materials include, steel structure, concrete, cladding, ducting and piping. Construction materials will be brought to site by road. Soil requiring removal offsite will be removed from site regularly to ensure there is minimal need for stockpiling. Some of the topsoil will be re-used on site for backfill (levels in some areas need to be raised) and landscaping with some export required. Any surplus topsoil material will be transported off site and disposed of at a fully authorised soil recovery facility / site.
- Construction activities will necessitate storage of cement and concrete materials, temporary oils, and fuels on site. Small localised accidental releases of contaminating substances including hydrocarbons have the potential to occur from construction traffic and vehicles operating on site; and
- No significant dewatering is anticipated during the construction phase which would result in the localised lowering of the water table.

5.4.2 OPERATIONAL PHASE

The proposed application developments will result in the increase in hardstanding area of 5.26 Ha. During operation measures there is no requirement for bulk fuels or chemical storage, no requirement for discharge to ground and no requirement for abstraction of groundwater.

5.5 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

This section details the potential impacts to land, soil and groundwater associated with the proposed development. As outlined below the activities required for the construction phase of the proposed development represents the greatest risk of potential impact on the geological and hydrogeological environment. These activities primarily pertain to the site preparation, excavation and infilling activities required to facilitate construction of the proposed development.

5.5.1 DO-NOTHING IMPACT

If the proposed development were not to go ahead (i.e., in the Do-Nothing scenario) there would be no excavation or construction or operational impact at this site. There would, therefore, be a neutral effect on the environment.

The site is zoned for residential development, and it is likely that in the absence of this subject proposal, that a development of a similar nature would be progressed on the site that accords with national and regional policies and, therefore, the likely effects would be similar to this proposal, as described in the following sections.

5.5.2 CONSTRUCTION PHASE

5.5.2.1 Potential Impacts on Land, Soil, Geology, and Hydrogeology

The primary impact during construction in relation to land soils and geology are:

There is potential for groundwater to become contaminated with pollutants associated with construction activity. Contaminated groundwater which arises from construction sites can pose a significant short-term risk to the underlying Dublin GWB quality for the duration of the construction if contaminated water is allowed to percolate to the aquifer. The potential main contaminants include:

- Pollution due to accidental discharges or spillages during the construction phase;
- Suspended solids (muddy water with increase turbidity) – arising from excavation and ground disturbance;
- Cement/concrete (increase turbidity and pH) – arising from construction materials;
- Hydrocarbons (ecotoxic) – accidental spillages from construction plant or onsite storage. Soils contaminated by petroleum hydrocarbons can affect soil health. They can harm soil microorganisms, reducing their number and activity;
- Wastewater (nutrient and microbial rich) – arising from accidental discharge from on-site toilets and washrooms.
- Excavation of soil and near-surface rock head will be required for levelling of the site to render it suitable for building the building platform. Local removal and reinstatement (including infilling) of the 'protective' topsoil and subsoil cover across the development area at the site will not change the overall vulnerability category for the site which is already 'extreme.' Capping of significant areas of the site by hardstand/ building following construction and installation of drainage will minimize the potential for contamination of the aquifers beneath the site.
- During the construction phase, excavated topsoil and subsoil and stones (c. 20,527.21 m³) will be generated from the excavations required to facilitate site levelling and construction of new foundations. It is anticipated that c. 4925.13 m³ will be reused on site. It is anticipated that c. 15,602.08 m³ of excavated material will need to be removed off site at a fully authorised soil recovery facility. Where material must be taken off-site, it will be taken for reuse or recovery, where practical, with disposal as a last resort.
- Excavated and stripped soil can be disturbed and eroded by site vehicles during the construction. Rainfall and wind can also impact on non-vegetated/uncovered areas within the excavation or where soil is stockpiled. This can lead to run-off with high suspended solid content which can impact on water bodies. The potential risk from this indirect impact to water bodies and/or habitats from contaminated water would depend on the magnitude and duration of any water quality impact.
- Due to the lack of previous development at the site and the historical greenfield use at the site, the risk of contaminated soils being present onsite is low. As with all construction projects there is potential for water (rainfall and/or groundwater) to become contaminated with pollutants associated with construction activity. Contaminated water which arises from construction sites can pose a significant short-term risk to groundwater quality for the duration of the construction if contaminated water is allowed to percolate to the aquifer.
- Accidental discharges can also occur from welfare facilities during construction activities. Wastewater can contain high levels of bacteria, chemicals, and organic matter, which could contaminate nearby water sources if discharged incorrectly. The establishment and use of welfare facilities and connection to the existing combined foul sewer, ensures that there are no potential significant impacts; therefore, no additional mitigation is required.

In addition to the unintentional spillages of the primary sources of contaminants mentioned above, there is also a risk that rainfall run-off excavation activities becoming contaminated by these sources. If not appropriately mitigated through containment, management, and monitoring, this could result in the mobilisation of these contaminants, leading to more widespread impacts on the surrounding environment.

5.5.2.2 Potential Impacts on Human Health and Populations

A reduction in groundwater quality via unmitigated pollutants entering the soil or Balbriggan GWB has the potential to lead to negative impacts on human health if there is a source pathway linkage to water supplies or open water areas. As there is no bulk chemical storage during operation this risk only exists during the construction phase. Hydrocarbons and petroleum products for example have the greatest risk for human health when they are in drinking water. The site is not located near any public groundwater supplies or group schemes with the nearest approximately 2.1 km to the southeast (BOG OF THE RING PWS and the proposed site is outside of the zone of contribution of this supply).

No source pathway linkage to an open water source used for bathing or recreation exists downstream from the site as outlined in section the Hydrology Chapter 6.

Furthermore, humans can also be exposed to petroleum hydrocarbons or other contaminants by inhaling the fumes / dust from contaminated soil. Depending on the type of contaminant and the level of exposure, soil contamination can have serious health implications. As no contamination was detected in the site-specific ground investigation report there is no source pathway linkage to humans.

The potential impacts during the construction phase on human health and populations due to changes to the potential for contamination of soil and groundwater are **neutral, imperceptible** and **short term**.

5.5.2.3 Potential Impacts on Water Framework Directive Status

There is a potential of accidental discharges during the construction phase (as previously set out in Section 5.4.2), however these are temporary short-lived events that will not impact on the water status of the underlying bedrock aquifer long-term and as such will not impact on trends in water quality and over all status assessment or programme of measures to improve the water body status.

The potential impact on water framework status during the construction phase is considered to be **negative, imperceptible-not significant**, and **short-term**. With mitigation, the impact will be **neutral, imperceptible**, and **short-term**.

5.5.3 OPERATIONAL PHASE

There will be no direct discharges to the ground or abstractions from the bedrock aquifer during the operation of the development. The potential impacts of the development post development in relation to land soils and environment have been assessed under the following headings:

- Localised and Minor Accidental Emissions to Ground from a car leak/delivery truck;
- Increase in hardstanding area (c. 5.26 Ha) will result in a localised reduction in recharge to the aquifer. This provides protection to the underlying aquifer but also reduces local recharge in this area of the aquifer. As the area of aquifer is large this reduction in local recharge will have no significant change in the natural hydrogeological regime. The use of modular permeable pavement (porous surfacing) in the parking areas will allow some percentage of recharge to the underlying bedrock aquifer.

With or without mitigation, the impact of the proposed development on land soils and groundwater post construction is considered to be **neutral, imperceptible**, and **long-term**.

5.6 MITIGATION MEASURES

This section outlines the measures that will be employed in order to minimise the impact on land, soils, and groundwater of the proposed development.

5.6.1 CONSTRUCTION PHASE

A Construction Environmental Management Plan (CEMP) (2024) is included with the application documentation and contained in Appendix D Volume III of this EIAR. This outlines the best practice construction techniques and methodologies which will be implemented during construction of the proposed development.

The CEMP and the mitigation measures contained in this EIAR, as well as any relevant conditions of a grant of permission, will be implemented and adhered to by the construction contractor and will be overseen and updated as required if site conditions change by the Project Manager, Environmental Manager and Ecological Clerk of Works where relevant. All personnel working on the Site will be trained in the implementation of the procedures.

The CEMP sets out the proposed procedures and operations to be utilised on the proposed construction site to protect soil and water quality. All mitigation measures outlined here, and within the CEMP will be implemented during the construction phase, as well as any additional measures required pursuant to planning conditions which may be imposed.

5.6.1.1 Soil Management

The strategy for controlling and mitigating potential adverse environmental issues related to soil and contamination during construction will include the following, as appropriate:

- Identification and assessment of the potential for residual ground contamination to be presented prior to the start of any excavation works.
- Minimisation of potential risks to site workers as required by the Safety, Health and Welfare (Construction Regulations) 2013.
- Testing and sampling of excavated soils in order to assess the suitability of materials for re-use on site.
- Dust suppression from any contaminated soils by the regular use of water spray during any dry conditions, sheeting of haulage vehicle loads.
- Stockpiling of contaminated materials will be avoided where possible.
- Stockpiles will be treated to prevent windblown dust.
- The handling and storage of any potentially hazardous liquids on site, e.g. fuels and chemicals, will be controlled and best practice guidelines. Storage tanks/container facilities will have appropriate bunding within the designated area.
- If hazardous liquids escape, remedial action will be taken as soon as possible.
- Where unforeseen contamination is identified during the course of the work, specific investigations will be carried out in the areas in question and appropriate health and safety procedures will be implemented during the removal of the material. A strategy will be prepared to identify, analyse, segregate and control existing contaminated materials on site. In addition to the measures above, all excavated materials will be visually assessed by suitably qualified persons for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of potential contaminants to ensure that historical pollution of the soil has not occurred. Should it be determined that any of the soil excavated is contaminated, this will be segregated and appropriately disposed of by a suitably permitted/licensed waste disposal contractor.

5.6.1.2 Run Off Suspended Solids

- During construction, any surfaces which are intended to enable infiltration must be protected from compaction. This includes protecting from heavy traffic or storage materials.
- Silt deposited during construction will be removed.
- Soils will be stabilised and protected from erosion whilst planting becomes established.

- Hydrocarbons or any hazardous chemicals will be stored in specific bunded areas. Refuelling of plant and machinery will also be carried out in bunded areas to minimise risk of any potential pollutants being discharged from the site.
- Pollution control measures will be implemented to control run-off from the site and prevent run-off which is potentially contaminated with sediments or hazardous chemicals entering the drainage network.
- Foul drainage from site offices and compound, where not directed to the existing wastewater network, will be contained and disposed of off-site in an appropriate manner and in accordance with the relevant statutory regulations to prevent the pollution of watercourses.
- A response procedure will be put in place to deal with any accidental pollution events and spillage kits will be available on site. Construction staff will be familiar with the emergency procedures and use of the equipment.
- During earthworks and excavation works care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the main excavation site which limits the potential for any offsite impacts;
- Silt reduction measures on site and settlement measures (e.g. silt traps and settlement tanks/ponds or equivalent);
- Any hard surface site roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only;
- A power washing facility or wheel cleaning facility will be installed near to the site compound for use by vehicles exiting the site when appropriate;
- Aggregate will be established at the site entrance points from the construction site boundary extending for at least 10 m;
- The temporary storage of soil will be carefully managed. Stockpiles will be tightly compacted to reduce runoff and graded to aid in runoff collection;
- Construction materials, including aggregates etc. will be stored a minimum of 20-meter buffer distance from any surface water bodies and surface water drainage points;
- Aggregate materials such as sands and gravels will be stored in clearly marked receptacles within a secure compound area to prevent contamination;
- Movement of material will be minimised to reduce the degradation of soil structure and generation of dust;
- Excavations will remain open for as little time as possible before the placement of fill. This will help to minimise the potential for water ingress into excavations;
- Weather conditions will be considered when planning construction activities to minimise the risk of run-off from the site.

5.6.1.3 Sources of Fill and Aggregates

- All fill and aggregate for the proposed development will be sourced from reputable suppliers per the project Contract and Procurement Procedures. All suppliers will be vetted for:
- Aggregate compliance certificates/declarations of conformity for the classes of material specified for the proposed development;
- Environmental Management status; and
- Regulatory and Legal Compliance status of the Company.

5.6.1.4 Cement /concrete works

Where feasible all ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil.

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. Washouts will only be allowed

to take place in designated areas with an impervious surface where all wash water is contained and removed from site by road tanker or discharged to foul sewer subject to agreement with Irish Water / FCC.

Pouring of cement-based materials for works will only be carried out in dry conditions. Pumped concrete will be monitored to ensure there is no accidental discharge. Mixer washings and excess concrete will not be discharged directly into the drainage network. Concrete washout areas will be created to avoid any accidental discharge from the proposed development site.

The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the Site will be suitably trained in the implementation of the procedures.

5.6.1.5 Hydrocarbons and other construction chemicals

The following mitigation measures will be implemented during the construction phase to prevent any spillages to ground of fuels and other construction chemicals and prevent any spillages resulting to surface water and groundwater systems:

- Designation of bunded refuelling areas on the Site;
- Provision of spill kit facilities across the Site;
- Where mobile fuel bowzers 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 bowzers to carry a spill kit and operatives must have spill response training;
 - Portable generators or similar fuel containing equipment will be placed on suitable drip trays.

In the case of drummed fuel or other potentially polluting substances which may be used during the construction phase, the following measures will be adopted:

- Secure storage of all containers that contain potential polluting substances in a dedicated internally bunded chemical storage cabinet unit or inside a concrete bunded area;
- Oil and fuel storage tanks shall be stored in designated areas, and these areas shall be stored within temporary bunded areas, double skinned tanks or bunded containers to a volume of 110% of the capacity of the largest tank/container. Drainage from the bunded area(s) shall be diverted for collection and safe disposal.
- Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage;
- All drums to be quality approved and manufactured to a recognised standard;
- If drums are to be moved around the Site, they will be secured and on spill pallets; and
- Drums will be loaded and unloaded by competent and trained personnel using appropriate equipment.

Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in a designated area or within the construction compound (or where possible off the site). In the event of a machine requiring refuelling outside of this area, fuel will be transported in a mobile double skinned tank. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. All relevant personnel will be fully trained in the use of this equipment. Guidelines such as “*Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors*” (CIRIA 532, 2001) will be complied with.

The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the Site will be suitably trained in the implementation of the procedures.

5.6.2 OPERATIONAL PHASE

The proposed development design includes hardstand cover across the site and the proposed surface water drainage system for this development has been designed as a sustainable urban drainage system. The surface water design has been designed in accordance with the Greater Dublin Regional Code of Practice for Drainage Works and Sewers for adoption. The drainage network will consist in 1 catchment attenuating to the green-field runoff at the last hydrobrake from the site on the combined detention basin system and discharging the attenuated flow at the existing stream (Clonard Brook Stream) located at the southern part of the site. Any localised car leaks will therefore discharge to the stormwater drainage and be treated in oil interceptors. Therefore, the risk of accidental discharge has been adequately addressed through design.

5.7 RESIDUAL IMPACTS

5.7.1 CONSTRUCTION PHASE

5.7.1.1 Land, soils, Geology, Hydrogeology

The implementation of the mitigation measures outlined in Section 5.5 of this chapter will ensure that targeted rates of impact to land, soils and ground water are achieved at the site of the Proposed Development during construction and operational phases. When mitigation measures are implemented throughout construction the predicted impact on the environment will be **short-term, imperceptible, and neutral**. With the measures outlined in the EIAR and CEMP, the predicted impact will be **long-term, imperceptible, and neutral**.

5.7.1.2 Human Health and Population

The implementation of the mitigation measures outlined in Section 5.5 of this chapter will ensure that the potential impacts on human health and populations during the construction phase are adequately mitigated. The residual effect on during the construction phase is considered to be **neutral, imperceptible, and short-term**.

5.7.1.3 Water Framework Directive

Even in the absence of the mitigation and monitoring measures detailed in Section 5.5, there will be no predicted degradation of the current Balbriggan (GWB) groundwater body (chemically, ecological and quantity) or any impact on its potential to meet the requirements and/or objectives in the second RBMP 2018-2021 (River Basin Management Plan) and draft third RBMP 2022-2027.

There are appropriately designed mitigation measures which will be implemented during the construction phase to protect the hydrogeological environment. There is a potential of accidental discharges during the construction phase, however these are temporary short-lived events that will not impact on the water status of groundwater bodies long-term and as such will not impact on trends in water quality and over all status assessment.

The residual effect on human health and populations during the construction phase is considered to be **neutral, imperceptible and short-term**.

5.7.2 OPERATIONAL PHASE

5.7.2.1 Land, soils, Geology, Hydrogeology

The implementation of the mitigation measures detailed in Section 5.5, will ensure that the potential impacts on land, soils, geology, hydrogeology once the proposed development is constructed and

operational are adequately mitigated. The residual effect on surface water quality during the operational phase is considered to be **neutral, imperceptible, and long-term**.

Following the TII criteria (refer to **Appendix C Volume III of the EIA**) for rating the magnitude and significance of impacts on the geological and hydrogeological related attributes, the magnitude of impact is considered **negligible**.

5.7.2.2 Human Health and Population

The implementation of the mitigation measures detailed in Section 5.5, will ensure that the potential impacts on human health and populations once the proposed development is constructed and operational are adequately mitigated. The residual effect on human health and populations during the operational phase is considered to be **neutral, imperceptible, and long-term**.

5.7.2.3 Water Framework Directive Status

There is no potential for adverse or minor temporary or localised effects on the Balbriggan groundwater body (GWB) as a result of the Proposed Development. Therefore, it has been assessed that it is unlikely that the proposed development will cause any significant deterioration or change on its water body status or prevent attainment, or potential to achieve the WFD objectives or to meet the requirements and/or objectives in the draft third RBMP 2022-2027.

Even in the absence of the mitigation measures detailed in Section 5.5, there will be no predicted degradation of the current water body (chemically, ecological and quantity) or any impact on its potential to meet the requirements and/or objectives in the draft third RBMP 2022-2027.

There are appropriately designed mitigation and design measures which will be implemented during the construction and operation phase to protect the hydrogeological environment. There is a potential of accidental discharges during the construction and operational phases, however these are temporary short-lived events that will not impact on the water status of underlying aquifer long-term and as such will not impact on trends in water quality and over all status assessment.

5.8 MONITORING OR REINSTATEMENT

The management of land, soils and ground water during the construction phase will be monitored by the Contractor to ensure compliance with above-listed mitigation measures, and relevant waste management legislation and local authority requirements.

5.8.1 CONSTRUCTION PHASE

During construction phase the following monitoring measures will be implemented:

- Soil sampling to confirm disposal options for excavated soils in order to avoid contaminated run-off; and
- Regular inspection of construction / mitigation measures (e.g., concrete pouring, refuelling, etc). Pouring of cement-based materials for works will only be carried out in dry conditions.

5.8.2 OPERATIONAL PHASE

There will be no requirement for groundwater monitoring as there is no likely discharge to ground.

5.9 INTERACTIONS

This section discusses interactions between this Chapter and other specialist environmental topics considered in this EIAR. The main interactions of importance to land, soils, geology, and hydrogeology relate to Biodiversity (Chapter 4), Hydrology / Water (Chapter 6), and Air Quality (Chapter 7) as follows.

5.9.1 BIODIVERSITY

The proposed development may have temporary negative impacts on biodiversity at site level during construction due to excavation and removal of soil with resultant impact on local biodiversity. It will not impose any significant impact on European Designated sites.

5.9.2 HYDROLOGY

During construction of the proposed development, there will be soil excavation that could impact surface water quality if not adequately mitigated.

5.9.3 AIR QUALITY

During construction of the proposed development, there will be a proportion of dust created that could impact air quality if not adequately mitigated.

5.9.4 TRAFFIC AND TRANSPORTATION

Local Traffic and transportation will be implemented by the additional vehicle movements generated by the volume of excavated soil that will have to be transported off site, resulting in an increase of heavy good vehicles (HGVs) during construction. The increase in vehicle movements as a result of excavated soil removal during the construction phase will be temporary in duration. Traffic-related impacts during the construction and operational phases are addressed in Chapter 11 of this EIAR (Traffic & Transportation).

5.10 CUMULATIVE IMPACTS

All cumulative developments that are already built and in operation contribute to our characterisation of the baseline environment. As such, any further environmental impacts that the proposed development may have in addition to these already constructed and operational cumulative developments has been assessed in the preceding sections of this chapter.

5.10.1 CONSTRUCTION PHASE

There are existing residential and commercial developments close by, along with the multiple permissions in the area. This chapter has been prepared with reference to the list of other developments in the locality as outlined in chapter 1 of this EIAR.

In relation to the potential cumulative impact on land soils and hydrogeology during the construction phases, the construction works which would have potential cumulative impacts are as follows:

- soil and groundwater contamination due to accidental hydrocarbon/cement leakage to ground.

A Construction Environmental Management Plan (CEMP) (2024) is included with the application documentation. This together with Section 5.5 outlines the best practice construction techniques and methodologies which will be implemented during construction of the proposed development to minimise potential for contamination.

The CEMP will be implemented and adhered to by the construction Contractor and will be overseen and updated as required if site conditions change by the Project Manager, Environmental Manager and Ecological Clerk of Works where relevant. All personnel working on the Site will be trained in the implementation of the procedures.

The works contractors for other planned or permitted developments will also be obliged to ensure that measures are in place to protect soil and water quality in compliance with legislative standards for receiving water quality (European Communities Environmental Objectives (Groundwater) Regulations (S.I. 9 of 2010, S.I. 366 of 2016 and S.I. 287 of 2022)).

The implementation of mitigation and monitoring measures detailed in Section 5.6; and 5.8 as well as the compliance of the above permitted development with their respective planning conditions, will ensure there will be minimal cumulative potential for change to the land, soils, geology, hydrogeological environment during the construction phase of the proposed development. The residual cumulative impact of the proposed development in combination with other planned or permitted developments can therefore be considered to be neutral, imperceptible, and short-term.

5.10.2 OPERATIONAL PHASE

In relation to the potential cumulative impact on hydrogeology during the operational phases, the operational activities which would have potential cumulative impacts are as follows:

- Increased hard standing areas will reduce local recharge to ground and increase surface water run-off potential if not limited to the green field run-off rate from the Site. Cumulatively this development and others in the area will result in localised reduced recharge to ground and increase in surface run-off;
- Increased risk of minor accidental discharge of hydrocarbons from car parking areas and along roads is possible unless diverted to surface water system with petrol interceptor;
- There will be a small loss of greenfield area locally as part of the proposed Project.

The proposed development and the other permitted development listed in in close proximity will result in an increase in hard standing which will result in localised reduced recharge to ground. The aquifer underlying the site is mostly “Locally Important – Bedrock which is Generally Moderately Productive only in Local Zones”. The implementation of SuDs measures on site will mitigate against and reduce the recharge rate to ground.

All nearby developments will also be obliged to ensure that measures are in place to protect soil and water quality in compliance with legislative standards for receiving water quality (European Communities Environmental Objectives (Groundwater) Regulations (S.I. 9 of 2010, S.I. 366 of 2016 and S.I. 287 of 2022)).

The implementation of mitigation measures detailed in Section 5.5 as well as the compliance of the above permitted development with their respective planning conditions, will ensure there will be minimal cumulative potential for change to the land, soils, geology, hydrogeological environment during the operational phase of the proposed development. The residual cumulative impact of the proposed development in combination with other planned or permitted developments can therefore be considered to be **neutral, imperceptible, and long-term**.

5.11 DIFFICULTIES ENCOUNTERED

There were no significant difficulties encountered in compiling the specified information for this EIA Chapter.

5.12 SUMMARY

There will be **no long-term residual impact** on land soil geology and hydrogeological receptors, either within or in the vicinity of the proposed development as a result of the proposed development.

5.13 REFERENCES

- Engineering Services Report- Proposed Residential Development at Ladywell, Balbriggan, Phase 4, Fingal County Council; Paul Mc Grail Consulting Engineers Limited (2024).
- Construction Environmental Management Plan- Proposed Residential Development at Ladywell, Balbriggan, Phase 4, Fingal County Council; Paul Mc Grail Consulting Engineers Limited (2024).
- Environmental Protection Agency Act 1992 as amended.
- European Commission, Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (2017).
- Environmental Protection Agency (EPA) 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' (2022).
- Flood Risk Assessment Report (FRA)- Proposed Residential Development at Ladywell, Balbriggan, Phase 4, Fingal County Council; Paul Mc Grail Consulting Engineers Limited (2024).
- Environmental Impact Assessment Report Volume II: Proposed Residential Development at Phase 3C Ladywell, Balbriggan, Co. Dublin; JSA Planning & Development Consultants.
- Ground Investigations Ireland Ltd. "Ground Investigations Ireland, Taylor Hill Balbriggan (Phase 3) Ground Investigation Report June 2020, Rev B"
- Ground Investigations Ireland Ltd. "Ground Investigations Ireland, Balbriggan Phase 4 Ground Investigation Report June 2024, Rev A".
- Forum for the Construction Industry – Recycling of Construction and Demolition Waste.
- Department of Communications, Climate Action, and Environment (DCCAE), Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025 (Sept 2020).
- FÁS and the Construction Industry Federation (CIF), Construction and Demolition Waste Management – a handbook for Contractors and site Managers (2002).
- Fingal County Council (FCC), Fingal Development Plan 2023-2029 (2022).
- FCC, Fingal County Council Segregation, Storage and Presentation of Household and Commercial Waste Bye-Laws project 2023-2025 (2020).
- BS 5906:2005 Waste Management in Buildings – Code of Practice.
- Planning and Development Act 2000 (No. 30 of 2000) as amended.
- CIRIA (2005). Environmental Good Practice on Site (C650).
- CIRIA (2007). CIRIA 697: The SUDS Manual.
- Enterprise Ireland (n.d.). Best Practice Guide BPGCS005: Oil Storage Guidelines.
- EPA (2022). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.
- EPA (2024). EPA Maps.
- GSI (2024). GSI Map Viewer.
- Institute of Geologists of Ireland (2013). Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements.
- NPWS (2024). Designations Viewer.
- NRA (2009). Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.
- Institute of Geologists of Ireland (2013). Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements.
- Teagasc (2024). Teagasc Map Viewer.
- National Roads Authority (NRA) (2009). Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.

6.0 WATER, HYDROLOGY, HYDROGEOLOGY

6.1 INTRODUCTION

This chapter assesses and evaluates the likely significant effects of the development on the hydrological aspects of the site and surrounding area. In assessing likely potential and predicted effects, account is taken of both the importance of the attributes and the predicted scale and duration of the likely effects.

This Chapter has been written and prepared by Luke Maguire Environmental Consultant and Geoscientist (BSc) at AWN Consulting and Teri Hayes (BSc MSc PGeol EurGeol) Senior Hydrogeologist and director at AWN Consulting. Luke Maguire; is an Environmental Consultant at AWN with over 3 years of experience in Environmental Consulting and water resources. Luke holds a B.Sc. in Geoscience (Geology, Hydrology, Geochemistry, Geophysics, Climate and Environmental studies) from Trinity College University of Dublin and has worked on a range of developments including pharmaceutical plants, medical device facilities, ICT facilities and energy projects. Luke has experience in contaminated soil sampling and analysis, basement impact assessments, bulk excavations and largescale dewatering processes. Additionally, Luke has gained experience in Environmental Impact Assessment (EIAR), Hydrological Risk Assessment, and WFD Assessment Reporting and has worked in multiple Environmental monitoring disciplines such as Chemical Wastewater (Intel), Ground Gas, Surface Water, and Groundwater Monitoring at numerous sites across Dublin.

Teri is a hydrogeologist with over 25 years of experience in water resource management and impact assessment. She has a Masters in Hydrogeology and is a former President of the Irish Group of the Association of Hydrogeologists (IAH) and has provided advisory services on water related environmental and planning issues to both public and private sector bodies. She is qualified as a competent person as recognised by the EPA in relation to contaminated land assessment (IGI Register of competent persons www.igi.ie). Her specialist area of expertise is water resource management eco-hydrogeology, hydrological assessment and environmental impact assessment.

6.2 METHODOLOGY

6.2.1 CRITERIA FOR RATING OF EFFECTS

This chapter evaluates the effects, if any, which the development has had or will have on Hydrology as defined in the Environmental Protection Agency (EPA) 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (EPA, 2022). In addition, the document entitled 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' by the Transport Infrastructure Ireland (TII, 2009, previously NRA) is referenced where the methodology for assessment of impact is appropriate.

The rating of potential environmental effects on the hydrological environment is based on the standard EIAR impact predictions table included in Chapter 1 which takes account of the quality, significance, duration and type of effect characteristic identified (in accordance with impact assessment criteria provided in the EPA Guidelines (2022) publication).

The duration of each effect is considered to be either momentary, brief, temporary, short-term, medium term, long-term, or permanent. Momentary effects are considered to be those that last from seconds to minutes. Brief effects are those that last less than a day. Temporary effects are considered to be those which are construction related and last less than one year. Short term effects are seen as effects lasting one to seven years; medium-term effects lasting seven to fifteen years; long-term effects lasting fifteen to sixty years; and permanent effects lasting over sixty years.

The TII criteria for rating the magnitude and significance of impacts and the importance of hydrological attributes at the site during the EIA stage are also relevant in assessing the impact and are presented in Tables 1-3 in Appendix C 5.2 Volume III of the EIAR.

The principal attributes (and effects) to be assessed include the following:

- River and stream water quality in the vicinity of the site (where available);
- Surface watercourses near the site and potential impact on surface water quality arising from proposed development related works including any discharge of surface water run-off;
- Localised flooding (potential increase or reduction) and floodplains including benefitting lands and drainage districts (if any); and
- Surface water features within the area of the site.

Relevant legislation/Guidelines

- The EU Water Framework Directive, 2000/60/EC;
- The Groundwater Directive, 2006/118/EC;
- The EU Floods Directive, 2007/60/EC; and
- Water Services Acts (2007 – 2014).
- European Communities (Water Policy) Regulations, 2003 (S.I. No. 722 of 2003);
- European Communities (Drinking Water) Regulations 2014 (S.I. 122 of 2014);
- European Communities Environmental Objectives (Surface Waters); Regulations, 2009 and amendments (S.I. No. 272 of 2009 as amended SI No. 77 of 2019);
- European Communities (Good Agricultural Practice for Protection of Waters) Regulations, 2010 (S.I. No. 610 of 2010); and
- European Communities (Technical Specifications for the Chemical Analysis and Monitoring of Water Status) Regulations, 2011 (S.I. No. 489 of 2011);
- Statutory Instrument (SI) No. 293 of 1988 European Communities (Quality of Salmonid Waters) Regulations 1988
- Local Government (Water Pollution) Acts 1977-1990;
- SI No. 258 of 1988 Water Quality Standards for Phosphorus Regulations 1998;
- Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites (Eastern Regional Fisheries Board);
- Central Fisheries Board Channels and Challenges – The enhancement of Salmonid Rivers;
- CIRIA C532 Control of Water Pollution from Construction Sites Guidance for Consultants and Contractors;
- CIRIA C648 Control of Water Pollution from Constructional Sites;
- Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (NRA/TII, 2006);
- OPW 2009 The planning System and flood Risk management- Guidelines for Planning Authorities.

6.2.2 SOURCES OF INFORMATION

Desk-based hydrological information in the vicinity of the site was obtained through accessing databases and other archives where available. Data was sourced from the following:

- Environmental Protection Agency (EPA) – website mapping and database information. Envision water quality monitoring data for watercourses in the area;
- River Basin Management Plan for Ireland 2022-2027.
- Fingal Development Plan 2023-2029.
- Uisce Éireann- Balbriggan WWTP (D0023-01) AER 2022.
- Fingal 2023-2029 Strategic Environmental Assessment (SEA).
- Fingal Development Plan 30.08.2023 Version 4- Written Statement.

- The Planning System and Flood Risk Management, Guidelines for Planning Authorities (Department of the Environment, Heritage and Local Government (DoEHLG) and the Office of Public Works (OPW));
- Office of Public Works (OPW) flood mapping data (www.floodmaps.ie)
- Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors' (CIRIA 532, 2001); and
- National Parks and Wildlife Services (NPWS) – Protected Site Register.

Site specific data was derived from the following sources:

- Engineering Services Report- Proposed Residential Development at Ladywell, Balbriggan, Phase 4, Fingal County Council; Paul Mc Grail Consulting Engineers Limited (2024).
- Construction Environmental Management Plan- Proposed Residential Development at Ladywell, Balbriggan, Phase 4, Fingal County Council; Paul Mc Grail Consulting Engineers Limited (2024).
- The proposed development design site plans and drawings; and Consultation with the project design engineers.
- Flood Risk Assessment (FRA)- Proposed Residential Development at Ladywell, Balbriggan, Phase 4, Fingal County Council; Paul Mc Grail Consulting Engineers Limited (2024).
- Design site plans and drawings; and
- Consultation with the client.

6.3 BASELINE RECEIVING ENVIRONMENT

6.3.1 LAND USE & TOPOGRAPHY

The subject lands have a combined area of c. 7.15 hectares at Folkstown in Balbriggan, North Co. Dublin. The lands are currently agricultural but located within a land bank that has a permitted residential development.

The development site is located approximately 1.5 km east of the Balbriggan district town centre. The proposed development (Masterplan Phase 4 "Folkstown" site) is bound on the south by Clonard Road (regional Route R122), on the east by under construction Phase 3, Boulevard Road and the committed Taylors Hill residential estate developments (Phase 1 and 2) and on the north by the future development. The subject development is bounded by Bridgefoot Road to the south and west, and Boulevard Road to the southeast and east (respectively) and further east by Taylor Hill Grange Residential Estate. Agricultural land bounds the site to the west and northwest.

The topography is relatively flat across the site with gentle / minor localised undulations and a slight gradient to the southeast and localised slopes falling towards the Clonard Brook Stream which traverses the site, flowing in an east-northeast direction through the southern parcel of the site.

6.3.2 HYDROLOGY

The proposed development site is located within the former ERBD (now the Irish River Basin District), as defined under the European Communities Directive 2000/60/EC, establishing a framework for community action in the field of water policy – this is commonly known as the Water Framework Directive (WFD). The proposed development site is located in the Eastern River Basin District (ERBD).

According to the EPA maps, the proposed development site lies within the Nanny-Delvin Catchment (Catchment ID: 08) and the PALMERSTOWN_SC_010 Sub-Catchment. The current EPA watercourse mapping shows one watercourses within the proposed development site.

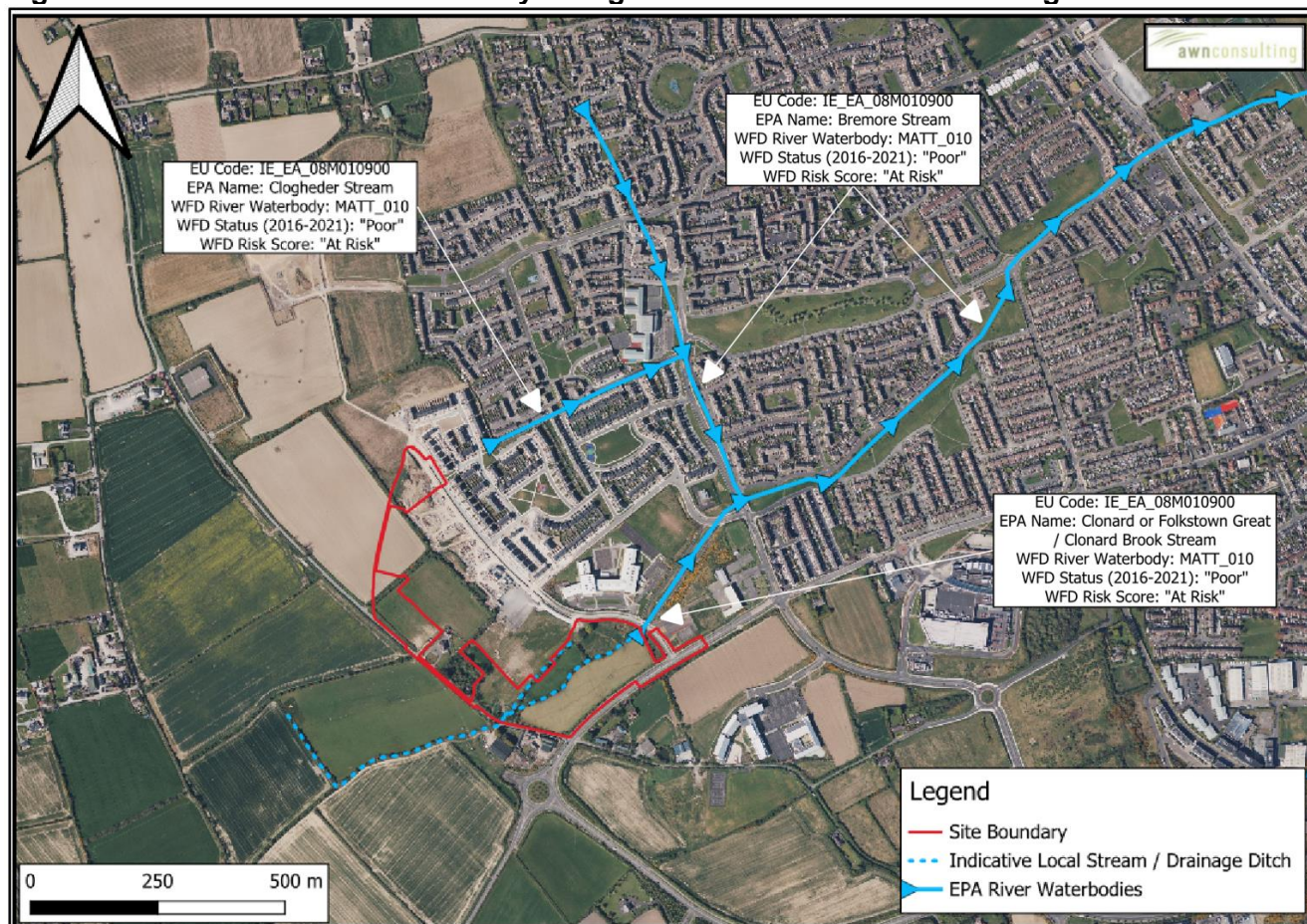
The site comprises multiple fields separated by hedgerows. Site drainage is towards the Clonard Brook Stream.

The main hydrological features of the area is the Clonard Brook stream, the Clonard or Folkstown Great and the Bremore River. The former is a tributary to the Clonard or Folkstown Great stream and ultimately the Bremore River Waterbody which flows in an easterly / northeasterly direction through the southern portion of the site (refer to figure 6.1 below). The Bremore River discharges to the Irish Sea north of Balbriggan Town Centre approximately 1.85 km northeast of the subject development (Hydrological distance).

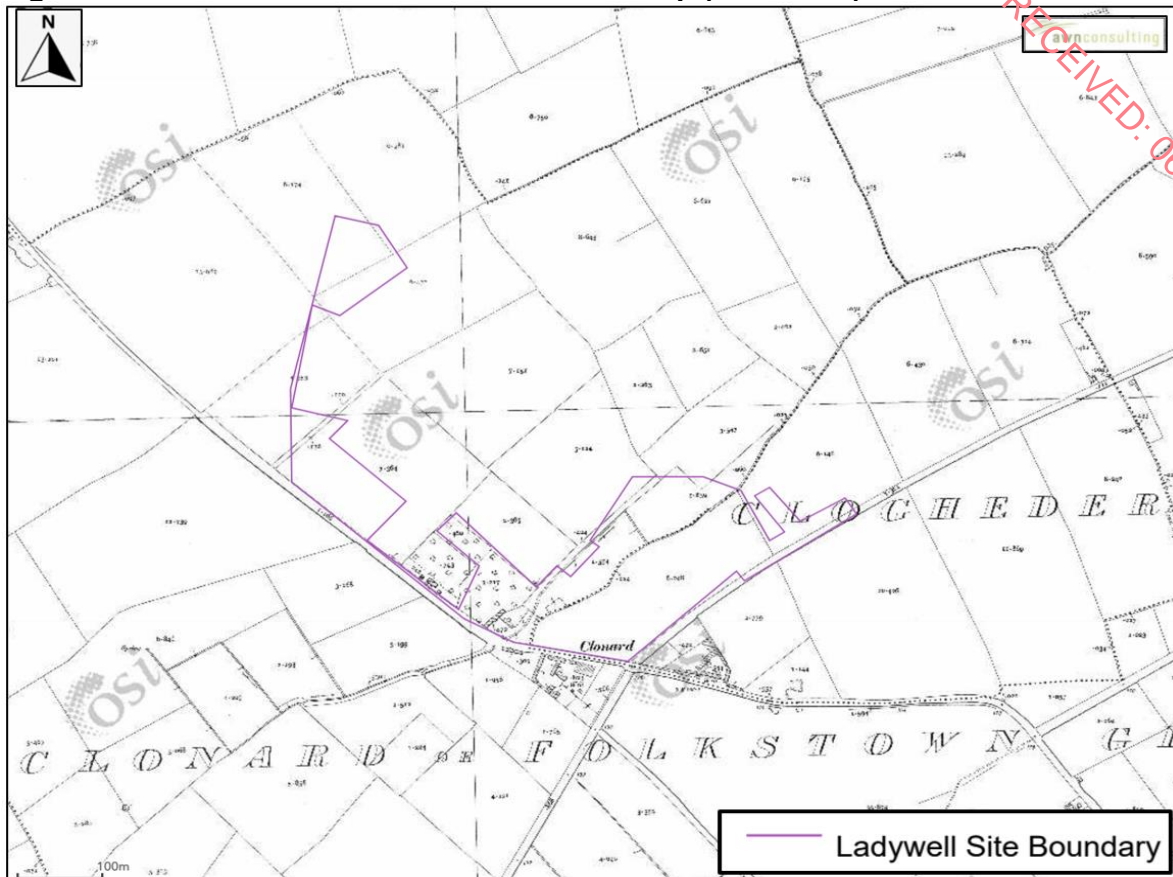
A survey of the site showed that the part of the site is drained by ditches which may convey flow to the Clonard Brook stream during periods of heavy rainfall. These manmade ditches only serve the subject site and the agricultural fields immediately to the north and west and does not convey any upstream watercourse.

Figure 6.2 below displays a Historical 25inch Black and White Map dated to 1897-1913) which depicting a Spring (Rise) within an agricultural plot located approximately 350m southwest of the subject site. The historical map shows a stream (Clonard Brook) rising from this spring and flowing in an east-northeast direction as it traverses the site.

Figure 6.1: Site Location and Local Hydrological Environment / Surrounding River Waterbodies



(Source: EPA, 2024)

Figure 6.2: Historical 25inch Black and White Map (1897-1913)

Note: depicting a Spring located within the agricultural land to the southwest of the subject development (Source: EPA, 2024)

6.3.3 SURFACE WATER QUALITY

The Water Framework Directive (WFD) requires 'Good Water Status' for all European waters to be achieved through a system of river basin management planning and extensive monitoring by 2015 or, at the least, by 2027. 'Good status' means both 'Good Ecological Status' and 'Good Chemical Status'. The third cycle Management Plan (2022-2027) is currently being undertaken by the Water Framework Directive.

The EPA identified water bodies either 'At Risk' of not achieving their objectives or 'Under Review'. The draft 3rd cycle River Basin management plan (RBMP) has been reviewed in the context of ensuring mitigation measures comply with current and expected future measures required to be implemented for protection of water body status within the context of the Proposed Project.

The proposed development is located within the Irish River Basin District), as defined under the European Communities Directive 2000/60/EC, establishing a framework for community action in the field of water policy – this is commonly known as the Water Framework Directive (WFD). It is situated in Hydrometric Area No. 08 of the Irish River Network and is located within the Nanny-Delvin Catchment and the PALMERSTOWN_SC_010 sub-catchment. The Clonard Brook Stream belongs to the MATT_010 WFD surface water body (European Code: IE_EA_08M010900) whose most recent WFD River (surface) water status (2016-2021) is 'Poor' with a current WFD risk score (3rd risk cycle) of 'At risk of not achieving good status'. This rating and the main pressures identified on the MATT_010 waterbody is attributed to poor ecological and biological status or potential (Catchments.ie, 2024). Currently, the EPA classifies the WFD Ecological Status for the Bremore (Liffey_180 WFD) waterbody as having 'Poor' (2016-2021) status with a current WFD River Waterbody risk score of 1a, 'At risk of not achieving good status'. This rating and the main pressures identified on the Bremore river waterbody are attributed to poor ecological and biological status or potential (Catchments.ie, 2023).

During the development of this 3rd cycle RBMP Plan, a prioritisation exercise was undertaken by the local authorities, the EPA and other stakeholders to identify those water bodies that require immediate action within this plan cycle to 2021. During the catchment characterisation, the EPA identified those water bodies either 'At Risk' of not achieving their objectives or 'Under Review'. The outcome of this prioritisation process was the selection of 190 Areas for Action across the 5 Local Authority regions. Within these 190 areas, a total of 726 water bodies were selected for initial actions during this RBMP cycle. There are 832 water bodies identified as being 'At Risk' of not achieving their environmental objectives under this Plan that have not been included in the Areas for Action. For most of these water bodies, targeted actions will be undertaken in the third cycle RBMP from 2022-2027. The draft 3rd cycle RBMP has been reviewed in the context of ensuring mitigation measures comply with current and expected future measures required to be implemented for protection of water body status within the context of the Proposed Project.

Surface water quality is monitored periodically by the EPA at various regional locations along with principal and other smaller watercourses. The EPA assess the water quality of rivers and streams across Ireland using a biological assessment method, which is regarded as a representative indicator of the status of such waters and reflects the overall trend in conditions of the watercourse. The biological indicators range from Q5 - Q1. Level Q5 denotes a watercourse with good water quality and high community diversity, whereas Level Q1 denotes very low community diversity and bad water quality.

In relation to the subject site, there are no EPA quality monitoring station points in close proximity or within any of the previously mentioned watercourses in hydrological connection to the site.

6.3.4 RECREATIONAL WATERBODIES & DRINKING WATER SUPPLIES

The local environment also includes areas of natural resources that relate to populations and human health that may be impacted by the proposed development, this includes economic resources, recreational and bathing waters, and drinking water resources.

A review of Environmental Sensitivity Mapping online maps that includes the Register of Protected Areas (RPA) under the Water Framework Directive (WFD) has shown that there are no Recreational Waters, Bathing Waterbodies, or Surface Water Drinking RPA, located downstream in the Clonard Brook Stream or the downstream Bremore River.

6.3.5 UTILITIES AND DRAINAGE INFRASTRUCTURE

The proposed development is located in agricultural land which currently drains by percolation into the soil under the influence of gravity and via overland flow to the Clonard Stream which traverses the southern portion the site flowing in an east/northeast direction.

Presently, there is no existing foul connection for the proposed site and there is no existing watermain connection on site.

6.3.6 FLOOD RISK ASSESSMENT

A Flood Risk Assessment (SSFRA) has been prepared by Paul McGrail Consulting Engineers, to support the planning application at Balbriggan, Co. Fingal. The proposed development (phase 4 of the Ladywell Masterplan known as Folkstown) is located to the North/South-Western of the greater Ladywell / Folkstown Masterplan site.

Predictive flood maps involving detailed hydraulic modelling of river waterbodies was undertaken as part of the National CFRAM study, which places a section of the site within Flood Zone C. The site therefore lies outside of the 0.1% AEP event, which indicates low flood risk (Floodinfo.ie, 2024), whereby the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding). Flood Zone C covers all areas on the plan which are not in zones A or B. It has been concluded within the FRA that the site is appropriate for the proposed residential development from a flood risk

perspective. The proposed Minimum Finished Floor Level is 34m O.D. which is approx. 8m above the 0.1% AEP Event.

Tidal flooding is not relevant as the site is approximately 40m above sea level. The site location is such that it is not affected by tidal water bodies and as such tidal flooding is negligible. The site location is such that it is not affected by coastal water bodies and as a result coastal flooding is negligible.

Additionally, predictive flood maps from Floodinfo.ie mapping dataset were examined (AWN Consulting, 2024) in order to determine flood risk in the vicinity of the site. A review of the historic flood information did not highlight historical flood events (single or reoccurring) onsite or the immediate vicinity surrounding area. Floodinfo.ie (formerly floodmaps.ie) was consulted to identify historical flooding events within the vicinity of the site. No historical flooding has been documented within the extent of the site or within the immediate vicinity.

Pluvial flooding is the result of rainfall-generated overland flows which arise before run-off can enter a watercourse or sewer. It is usually associated with high intensity rainfall and typically occurs in the summer months. The SFRA Indicative Pluvial Flood Maps were also reviewed. No pluvial flood risk for the site or vicinity was identified.

6.3.7 AREAS OF CONSERVATION

A review of the NPWS (2024) on-line database confirmed there are no water dependent special protected areas (SPA) or special areas of conservation (SAC) on or within the boundary of the proposed development site. The lands in which the development is located have no formal designations.

There is an indirect hydrological pathway to nationally designated sites in North-West Irish Sea via the Clonard Brook Stream and Bremore River which flow in an east/northeasterly direction before its outfall to the Irish Sea over a kilometre downgradient of the site. The relevant natura 2000 conservation site is:

- North-West Irish Sea SPA (Site Code: IE004236) c. 1.9 km (hydrological distance) to the east of the site.

Figure 6.3: Natura 2000 conservation areas in the context of the subject site

(Source: EPA, 2024).

6.3.8 RATING OF IMPORTANCE OF HYDROLOGICAL ATTRIBUTES

Based on the TII methodology (2009) (See Volume III EIAR Appendix C 5.2) the importance of the hydrological features at this site is rated as 'Low importance' based on the assessment that the attribute has a low-quality significance or value on a local scale. The lands are not an area of water supply, within a flood zone or an amenity area.

There is an objective (WFD) to maintain good status or not impact on programme of measures to achieve Good status of this surface water receptor (Clonard Stream) during construction and operation.

6.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The development will consist of the construction of 197 residential units / dwellings, 2 no. commercial units, ancillary infrastructure and services (attenuation, foul sewer, surface water), as well as public open spaces for the overall Phase 4.

6.4.1 CONSTRUCTION PHASE

The key civil engineering works which relate to the hydrological environment during construction of the proposed development are summarised below:

- During the construction phase, excavated topsoil and subsoil and stones (c. 20,527.21 m³) will be generated from the excavations required to facilitate site levelling to the necessary base level and construction of new foundations. It is anticipated that c. 4,925.13 m³ will be reused on site. It is anticipated that c. 15,602.08 m³ of excavated material will need to be removed off site at a fully authorised soil recovery facility.

- Storage of aggregate materials such as sands and gravels will be stored in clearly marked receptacles in a secure compound area within the contractors' compound on site. Temporary storage of spoil will be managed to prevent accidental release of dust and uncontrolled surface water run-off which may contain sediment and solid matter. Any excavated material temporarily stockpiled onsite for re-use during reinstatement will be managed to prevent accidental release of dust and uncontrolled surface water run-off which may contain sediment etc; There will be a requirement for deliveries of imported engineering fill (sands and gravels), and other construction materials include, steel structure, concrete, cladding, ducting and piping. Construction materials will be brought to site by road. Soil requiring removal offsite will be removed from site regularly to ensure there is minimal need for stockpiling. Some of the topsoil will be re-used on site for backfill (levels in some areas need to be raised) and landscaping with some export required. Any surplus topsoil material will be transported off site and disposed of at a fully authorised soil recovery facility / site.
- Temporary storage of fuel required for on site for construction traffic. Liquid materials i.e., fuel storage will be located within temporary bunded areas, doubled skinned tanks or bunded containers (all bunds will conform to standard bunding specifications - BS8007-1987) to prevent spillage;
- Construction activities will necessitate storage of cement and concrete materials, temporary oils, and fuels on site. Small localised accidental releases of contaminating substances including hydrocarbons have the potential to occur from construction traffic and vehicles operating on site; and
- No significant dewatering is anticipated during the construction phase which would result in the localised lowering of the water table.

6.4.2 OPERATIONAL PHASE

There will be an increase in hardstand (5.26 ha) and a resultant increase in run-off rate for storm water due to the proposed development. The proposed development characteristics which relate to the water and hydrological environment during operation of the proposed development are summarised below:

6.4.2.1 Proposed Surface Water Drainage

The surface water connection for the site will be into the Clonard Brook at the southern end of the site. The Clonard Brook Stream on the adjacent downgradient permitted development (located to the north of the subject development) had already been widened to form a riparian corridor (refer to section 6.6.2.1 below for further details) as part of the previously permitted Phase 3 Ladywell development. For continuity it is intended to be widened the existing brook at the southern end of the site to form a riparian corridor.

The proposed surface water drainage system designed for these developments includes a number of Sustainable Urban Drainage Systems (SuDS) measures which will be incorporated to reduce run-off volumes and improve run-off water quality. The SuDS mechanisms will comprise modular permeable paving, swales, bioretention systems, Detention Basins (above ground storage), petrol interceptors, Hydrobrake flow control and attenuation. These features will be provided to cater for up to a 1-in-100-year rainfall event plus 20% allowance for climate change characteristics. Surface water runoff from the development would be attenuated to greenfield runoff (Q_{bar}), in accordance with the recommendations of the GDSDS.

For further details, refer to the Engineering Services Report Assessment, prepared by Paul McGrail Consulting Engineers, included as part of this Application.

6.4.2.2 Proposed Foul and Stormwater Water Infrastructure

Strict separation of surface water and wastewater will be implemented within the development. It is proposed that foul water drainage from the new residential development shall connect to the existing Ø225mm Uisce Eireann Wastewater Clonard Road Junction and Boulevard Road, and ultimately discharges to Balbriggan WWTP. There is an indirect hydrological connection to the North-west Irish Sea SPA, via treated foul wastewater arising at the site from the Balbriggan WWTP (EPA Licence D0023-01).

For further details, refer to the Engineering Services Report Assessment and included as part of this Application.

6.5 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

6.5.1 DO-NOTHING IMPACT

If the proposed development were not to go ahead (i.e., in the Do-Nothing scenario) there would be no excavation or construction or operational impact at this site. There would, therefore, be a neutral effect on the environment. The site is zoned for residential development, and it is likely that in the absence of this subject proposal, that a development of a similar nature would be progressed on the site that accords with national and regional policies and, therefore, the likely effects would be similar to this proposal, as described in the following sections.

6.5.2 CONSTRUCTION PHASE

6.5.2.1 Potential Impacts on Surface Water Quality

Land clearing, earthworks and excavations for foundations and services will necessitate the removal of vegetation cover and the excavation of soil and subsoils. As a result, there is potential for run-off water to become contaminated with pollutants/silt released during construction activity. If not mitigated, contaminated water can pose a temporary risk to the Clonard Brook Stream.

During construction of the development, the potential of contamination is associated with the following sources:

- Suspended solids (muddy water with increased turbidity (measure of the degree to which the water loses its transparency due to the presence of suspended particulates)) – arising from excavation and ground disturbance;
- Cement/concrete (increase turbidity and pH) – arising from construction materials;
- Hydrocarbons and other construction chemicals (ecotoxic) – accidental spillages from construction plant or onsite storage;
- Wastewater (nutrient and microbial rich) – arising from accidental discharge from on-site toilets and washrooms. Construction phase sewerage will be taken by tanker off site for disposal at a licensed waste management facility.

Based on the distance to Natura sites there is no likelihood of an impact on the surface water quality in the Bremore River Waterbody or Natura sites (North-West Irish Sea SPA).

In the absence of mitigation measures the potential impacts during the construction phase on surface water quality are **negative, not significant** and **temporary**.

6.5.2.2 Potential Impacts on Surface Water Flow and Quantity

The gradual introduction of impermeable surfaces and the compaction of soils across the construction site as a result of the land clearing and earthworks will reduce the infiltration capacity and increase the rate and volume of direct surface run-off. The potential impact of this is a possible increase in surface water run-off which could potentially impact local drainage if not adequately attenuated. This increase in the rate and volume of direct surface run-off can result in increased sediment loading, scouring impacts on local drainage and watercourse.

It is proposed to divert local drainage to the Clonard Brook Stream. The surface water connection for the site will be into the Clonard Brook at the southern end of the site. The existing stream eastern of the development had been widened to form a riparian corridor. For continuity it is intended to be widened the existing brook at the southern end of the site to form a riparian corridor.

Based on the distance to Natura sites there is no likelihood of an impact on the surface water flow in the Bremore River Waterbody or Natura sites (North-West Irish Sea SPA).

In the absence of mitigation measures the potential impacts during the construction phase on surface water quality and flow are **negative, not significant** and **short term**.

6.5.2.3 Potential Impacts on Human Health and Population

A reduction in water quality via unmitigated pollutants entering the stream or surface waterbody has the potential to lead to negative impacts on human health and populations. However, it is noted that there are no recorded Recreational Waters, Bathing Waterbodies, or Surface Water Drinking RPA, located downstream in the Clonard Brook Stream and the Bremore River.

The potential impacts during the construction phase on human health and populations due to changes to the hydrological environment are neutral, imperceptible and short term

6.5.2.4 Potential Impacts on Water Framework Directive Status

There is a potential of localised accidental discharges during the construction phase (as set out in Section 6.5.2.1), however these are temporary short-lived events that will not impact on the surface water status of the Clonard Brook Stream and the downstream Bremore River long-term and as such will not impact on trends in water quality and overall WFD status assessment.

There is no potential impact on Water Framework Directive status or Programme of Measures to achieve Good status.

6.5.3 OPERATIONAL PHASE

6.5.3.1 Surface Water Drainage

Potential Impacts on Surface Water Quality

The proposed development incorporates a sustainable drainage system that is to be integrated with the developments landscaping features and comprises a combination of multiple measures in relation to flow control, interception storage, attenuation storage and catchment conveyance features. In addition, petrol interceptors are included within the network to treat any localised spill prior to discharge off site. Refer to Proposed Drainage Layout drawings included with this Application for details of the proposed stormwater network.

The design incorporates development and maintenance of a riparian corridor (minimum 10 meter) adjacent to the stream. The riparian corridor will be a minimum 10m wide riparian buffer strip measured from the top of the bank either side of the Clonard Brook Stream (refer to section 6.6.2.1 below for further detail). This together with the SuDs measures for managing water quality and flow on site will enhance the habitat surrounding the stream run through the site, which is currently silt laden, dry and heavily overgrown in places. It is proposed to use a sustainable urban drainage system (SuDS) approach to stormwater management throughout the site where possible. The overall strategy aims to provide an effective system to mitigate the adverse effects of urban stormwater runoff on the environment by reducing runoff rates, volumes and frequency, reducing pollutant concentrations in stormwater.

There is no requirement for bulk oil / fuel storage onsite. Surface water runoff from roads, car parking areas can potentially contain slightly elevated levels of contaminants such as hydrocarbons which will be collected within on-site drainage and treated in oil interceptors with no resultant impact on the Clonard stream.

Potential Impacts on Surface Water Quantity and flow

The proposed project is located within Flood Zone C, which indicates low flood risk. The design of the development and drainage infrastructure will ensure that the run-off rate is similar to greenfield run-off.

The proposed increase in hardstanding area (c. 5.26 Ha / 52,600m²) has the potential to resulting in increase in run-off from the site if attenuation on site is not adequately designed.

The surface water drainage from the proposed development site has been designed (see Infrastructure report, 2024) to ensure that there is no increase in flow rates and volumes, from the development site, being discharged to the receiving infrastructure and waterbodies; thus, causing no adverse impact on adjoining and other downstream properties.

Surface water runoff from the development will be attenuated to greenfield runoff (Q_{bar}), in accordance with the recommendations of the GDSDS. Surface water run-off from each surface water catchment will be attenuated using a Hydrobrake on the surface water outlet from each catchment. Surface water runoff exceeding the allowable outflow rate for the catchment will be stored in detention basins for rainfall events up to a 1 in 100-year return period. with an allowance for climate change of 20%.

The discharge rates are to be restricted to a greenfield runoff equivalent of the Q_{bar} runoff rate. the overall site catchment is 15.74Ha with 10.48Ha of the under-construction phase 3 and 5.26Ha of the proposed development phase 4 resulting in a total greenfield runoff of 80.52/s. A development north of the subject site is proposed on adjoining land and the greenfield run off from this site will discharge to the proposed Balbriggan network in a total runoff is equivalent to 50l/s (catchment area for phase 3). Therefore, the maximum allowable discharge on the outfall is the combination of these greenfield runoffs totalling 130.52l/s (for proposed catchment). Utilising the topography of the site and the levels within the riparian corridor, the hydrobrakes have been adjusted to maximise the volume in each area. The total runoff from the site matches the greenfield runoff of 130.52 l/s.

A review of the Balbriggan Barnageeragh Annual Environmental report (2022) confirmed that there is adequate capacity for foul water. This AER report states that the capacity will not be exceeded in the next 3 years (from 2022). The peak effluent discharge (Design Flow as constructed), for the Proposed Development is 1.028 l/s which would only equate to 0.18% of the licensed discharge at Balbriggan Barnageeragh WWTP [peak hydraulic capacity]). The stormwater and foul water will be separated on site and stormwater will be attenuated the Proposed Development will not contribute any additional stormwater drainage to the WWTP.

With design measures in place, the impact on surface water flow and quality are **neutral, imperceptible, long-term.**

6.6 MITIGATION MEASURES

The design has taken account of the potential impacts of the development on the hydrological environment local to the area where construction is taking place and containment of contaminant sources during operation. Measures have been incorporated in the design to mitigate the potential effects on the surrounding water bodies.

6.6.1 CONSTRUCTION PHASE

A Construction Environmental Management Plan (CEMP) (2024) is included with the application documentation and contained in Appendix D, Volume III of this EIAR. This outlines the best practice construction techniques and methodologies which will be implemented during construction of the proposed development including measures to protect waters bodies. The CEMP sets out the proposed procedures and operations to be utilised on the proposed construction site to protect water quality. The mitigation and control measures outlined in the CEMP and this EIAR will be employed on site during the construction phase.

The CEMP and mitigation measures set out in this EIAR will be implemented and adhered to by the construction Contractor and will be overseen and updated as required if site conditions change by the Project Manager, Environmental Manager and Ecological Clerk of Works where relevant. All personnel working on the site will be trained in the implementation of the procedures.

All mitigation measures outlined in this chapter, and within the CEMP will be implemented during the construction phase, as well as any additional measures required pursuant to planning conditions which may be imposed.

The CEMP and this EIAR contains best practice measures and protocols to be implemented during the construction phase of the proposed development to avoid / minimise environmental impacts.

Construction works and the proposed mitigation measures are informed by best practice guidance on the prevention of pollution during development projects including but not limited to:

- Construction Industry Research and Information Association (CIRIA), Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (C532);
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (2016);
- Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on Site (4th edition), (C741); and
- Enterprise Ireland Best Practice Guide, Oil Storage Guidelines (BPGCS005).

The CEMP provides actions and measures which will be undertaken for the purpose of environmental management and pollution prevention during the construction phase. As there is potential for run-off to indirectly discharge to a watercourse (Clonard Brook Stream, also known as the Bremore Stream) in the vicinity of the site and in order to manage the potential impact associated with sediment and sediment runoff the following mitigation measures will be implemented during the construction phase:

- SuDS will be constructed in line with manufacturer's guidelines / best practice methods.
- This development includes an attenuation system stormtech underground to cater for the 100-year return period and a detention basin to cater for the 1-100 year were designed for this site. The design of the attenuation is in accordance with CIRIA SuDS Manual C753 2015. Please refer to the accompanying drawings for further information.
- During construction, any surfaces which are intended to enable infiltration must be protected from compaction. This includes protecting from heavy traffic or storage materials.
- Any surface water run-off collecting in excavations will likely contain a high sediment load. This will not be allowed to directly discharge directly to the Clonard Brook stream.

- Water contaminated with silt will not be allowed to enter a watercourse or drain as it can cause pollution. All parts of the drainage system will be protected from construction runoff to prevent silt clogging the system and causing pollution downstream. Silt reduction measures to prevent this include, early construction of sediment management basins, channelling runoff away from watercourses and surface water drains and erosion prevention measures. Following construction, subsoil that has been compacted during construction should be broken up prior to the re-application of topsoil to reinstate the natural infiltration performance of the ground.
- Pipe systems and orifices will be checked for blockages or partial blockages.
- Soils will be stabilised and protected from erosion whilst planting becomes established. All exposed soil surfaces will be within the main excavation site which limits the potential for any offsite impacts.
- The temporary storage of soil will be carefully managed. Stockpiles will be tightly compacted to reduce runoff and graded to aid in runoff collection.
- Pollution control measures will be implemented to control run-off from the site and prevent run-off which is potentially contaminated with sediments or hazardous chemicals entering the drainage network.
- A response procedure will be put in place to deal with any accidental pollution events and spillage kits will be available on site. Construction staff will be familiar
- Any hard surface site roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only.
- A power washing facility or wheel cleaning facility will be installed near to the site compound for use by vehicles exiting the site when appropriate,
- Aggregate materials such as sands and gravels will be stored in clearly marked receptacles within a secure compound area to prevent contamination.
- Movement of material will be minimised to reduce the degradation of soil structure and generation of dust.
- Excavations will remain open for as little time as possible before the placement of fill. This will help to minimise the potential for water ingress into excavations.
- Weather conditions will be considered when planning construction activities to minimise the risk of run-off from the site.
- all excavated materials will be visually assessed by suitably qualified persons for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of potential contaminants to ensure that historical pollution of the soil has not occurred. Should it be determined that any of the soil excavated is contaminated, this will be segregated and appropriately disposed of by a suitably permitted/licensed waste disposal contractor.
- Surface water discharge from the site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system of the proposed site is complete.

6.6.1.1 Cement/concrete works

Where feasible all ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil.

Pouring of cement-based materials for works will only be carried out in dry conditions. Pumped concrete will be monitored to ensure there is no accidental discharge. Mixer washings and excess concrete will not be discharged directly into the drainage network. Concrete washout areas will be created to avoid any accidental discharge from the proposed development site.

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. Washouts will only be allowed to take place in designated areas with an impervious surface where all wash water is contained and removed from site by road tanker or discharged to foul sewer submit to agreement with Irish Water / FCC.

The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the Site will be suitably trained in the implementation of the procedures.

6.6.1.2 Hydrocarbons and other construction chemicals

The following mitigation measures will be implemented during the construction phase in order to prevent any spillages to ground of fuels and other construction chemicals and prevent any resulting to surface water and groundwater systems:

- Designation of bunded refuelling areas on the Site;
- Provision of spill kit facilities across the Site;
- Where mobile fuel bowsters 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 bowsters to carry a spill kit and operatives must have spill response training;
 - Portable generators or similar fuel containing equipment will be placed on suitable drip trays.
- In the case of drummed fuel or other potentially polluting substances which may be used during the construction phase, the following measures will be adopted:
 - Secure storage of all containers that contain potential polluting substances in a dedicated internally bunded chemical storage cabinet unit or inside a concrete bunded area;
 - Oil and fuel storage tanks shall be stored in designated areas, and these areas shall be stored within temporary bunded areas, double skinned tanks or bunded containers to a volume of 110% of the capacity of the largest tank/container. Drainage from the bunded area(s) shall be diverted for collection and safe disposal.
- Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage;
- All drums to be quality approved and manufactured to a recognised standard;
- If drums are to be moved around the Site, they will be secured and on spill pallets; and Drums will be loaded and unloaded by competent and trained personnel using appropriate equipment.
- Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in a designated area or within the construction compound (or where possible off the site). In the event of a machine requiring refuelling outside of this area, fuel will be transported in a mobile double skinned tank. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. All relevant personnel will be fully trained in the use of this equipment.
- The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the Site will be suitably trained in the implementation of the procedures.

6.6.1.3 Rainwater Run-off

Rainfall at the construction site will be managed and controlled for the duration of the construction works until the permanently intercepted and attenuated surface water drainage system of the proposed site is complete. In the meantime, rainwater will continue to discharge to ground as current.

6.6.1.4 Wastewater Management

Foul drainage from site offices and compound, where not directed to the existing wastewater network, will be contained and disposed of off-site in an appropriate manner and in accordance with the relevant statutory regulations to prevent the pollution of watercourses.

6.6.1.5 Surface Water Flow and Quantity

During construction a site drainage and protection system will be built to reduce the flow of run-off from the site, prevent soil erosion, and protect water quality in the Clonard Brook Stream and Bremore River. Temporary excavated channels, bunds, or ridges or a combination of the three, may be constructed to divert sediment-laden water to an appropriate sediment retention structure. These will be installed to provide permanent diversion of clean stormwater away from erosion exposed soil areas, or to provide a barrier between exposed areas and unexposed areas of the construction site. Runoff diversion channels/bunds need regular maintenance to keep functioning throughout their life.

6.6.1.6 Human Health and Population

It has been established (Section 6.3.3) that there are no recorded Recreational Waters, Bathing Waterbodies, or Surface Water Drinking RPA, located downstream in the Clonard Brook stream or the Bremore River. On a precautionary basis, the mitigation measures set out above in Section 6.6 will be implemented during the construction works for the protection of human health and populations.

6.6.1.7 Potential Impacts on Water Framework Directive

It has been established (Section 6.5.2) that while, there is a potential of accidental discharges during the construction phase this will not impact on trends in water quality and overall WFD status assessment. On a precautionary basis, the mitigation measures previously set out in Section 6.6 above, will be implemented during the construction works for the protection of surface water status and achievement of the programme of measures.

6.6.2 OPERATIONAL PHASE

6.6.2.1 Surface Water Quality

The design has taken account of the potential impacts of the development on surface water quality; measures have been incorporated in the design to mitigate these potential impacts.

The proposed development stormwater drainage network design includes sustainable drainage systems (SuDS). These measures by design ensure the stormwater leaving the site is to be attenuated and treated within the new development site boundary to ensure suitable quality, before discharging to the Clonard Brook stream, which subsequently outfalls to the nearby Bremore River. SuDS are drainage systems that are environmentally beneficial, causing minimal or no long-term detrimental damage. The SuDS design is set out in the Engineering Services Report (2024) and uses above-ground storage detention basins (interception system), bioretention systems, flow control devices (Hydrobrake), grass swales, modular permeable paving (porous surfacing), and petrol interceptors.

The purpose of the SuDS design is to:

- Treat runoff and remove pollutants to improve quality;
- Restrict outflow and to control quantity;
- Increase amenity value.

According to Fingal 2023-2029 Strategic Environmental Assessment (SEA), objective IUO26 states developments must '*ensure a minimum 10m wide riparian buffer strip measured from the top of the bank either side of all watercourses*', which applies to lands within development boundaries as per FCC. A riparian buffer along the Clonard stream will be established and landscaped. This will improve the flow and habitat characteristics of the stream both on and off site. The riparian zones will be fisheries compliant and will contain features for biodiversity enhancement.

The layout of the proposed surface water drainage network is shown on Paul McGrail Consulting Engineers Ltd (2024) Drawing Set included with this Application. It is proposed to strictly separate the

surface water and wastewater drainage networks, which will serve the proposed development, and provide independent connections to the surface water and wastewater sewer networks respectively.

6.6.2.2 Surface Water Flow and Quantity

The design has taken account of the potential impacts of the development on surface water flow; measures have been incorporated in the design to mitigate these potential impacts.

As set out in the Engineering Services Report (2024), flow restriction is achieved by means of a hydro-brake installed at the outfall of each surface water catchment within the development, with the excess storm water stored on site for the duration of the storm periods of up to 1 in 100 years. The surface water network has been designed to provide sufficient capacity to contain and convey all surface water run-off associated with the 1-in-100-year event to the detention basins for attenuation without any overland flooding.

Surface water runoff exceeding the allowable outflow rate for the catchment will be stored in detention basins for rainfall events up to a 1 in 100-year return period with an allowance for climate change of 20%. The proposed development includes a new surface water network which will mitigate any pluvial risk to the site in line with SuDS measures.

6.7 RESIDUAL IMPACTS

6.7.1 CONSTRUCTION PHASE

6.7.1.1 Surface Water Quality

The implementation of the mitigation measures detailed in Section 6.6, will ensure that the potential impacts on surface water quality during the construction phase are adequately mitigated. The residual effect on surface water quality during the construction phase is considered to be neutral, imperceptible and short-term.

6.7.1.2 Surface Water Flow and Quantity

The implementation of the mitigation measures detailed in Section 6.6, will ensure that the potential impacts on surface water flow and quantity during the construction phase are adequately mitigated. The residual effect on surface water flow and quantity during the construction phase is considered to be **neutral, imperceptible** and **short-term**.

6.7.1.3 Human Health and Populations

The implementation of the mitigation measures detailed in Section 6.6, will ensure that the potential impacts on human health and populations (and material assets) during the construction phase are adequately mitigated. The residual effect on human health and populations during the construction phase is considered to be **neutral, imperceptible** and **short-term**.

6.7.1.4 Water Framework Directive Status

Even in the absence of the mitigation measures detailed in Section 6.6, there will be no predicted degradation of the current water body (chemically, ecological and quantity) or any impact on its potential to meet the requirements and/or objectives in the second RBMP 2018-2021 (River Basin Management Plan) and draft third RBMP 2022-2027.

There are appropriately designed mitigation measures which will be implemented during the construction phase to protect the hydrological environment. There is a potential of accidental discharges during the construction phase, however these are temporary short-lived events that will not impact on the water status

of waterbodies long-term and as such will not impact on trends in water quality and over all status assessment.

The residual effect on the WFD status during the construction phase is considered to be **neutral, imperceptible** and **short-term**.

6.7.2 OPERATIONAL PHASE

6.7.2.1 Surface Water

The implementation of the mitigation measures detailed in Section 6.6, will ensure that the potential impacts on surface water quality once the proposed development is constructed and operational are adequately mitigated. The residual effect on surface water quality during the operational phase is considered to be **neutral, imperceptible** and **long-term**.

There will be no impact to the quality of downstream designated sites due to the lack of direct hydraulic connectivity, the significant distance between the subject development and designated areas, and the mitigation measures cited. In addition, the overall management of the riparian zone, improvement measures to the stream and SuDS for the project and installation of petrol / hydrocarbon interceptors / separators will improve habitat requirements in the stream, flood management and water quality.

6.7.2.2 Human Health and Populations

The implementation of the mitigation measures detailed in Section 6.6, will ensure that the potential impacts on human health and populations (and material assets) once the proposed development is constructed and operational are adequately mitigated. The residual effect on human health and populations during the operational phase is considered to be **neutral, imperceptible** and **long-term**.

6.7.2.3 Water Framework Assessment

Even in the absence of the mitigation measures detailed in Section 6.6, there will be no predicted degradation of the current water body (chemically, ecological and quantity) or any impact on its potential to meet the requirements and/or objectives in the second RBMP 2018-2021 (River Basin Management Plan) and draft third RBMP 2022-2027.

There are appropriately designed mitigation measures which will be implemented during the operational phase to protect the hydrological environment. There is a potential of accidental discharges during the operational phase, however these are temporary short-lived events that will not impact on the water status of waterbodies long-term and as such will not impact on trends in water quality and over all status assessment.

There are no untreated discharges of wastewater during the operational phase to any open waterbody / watercourse. The discharge to surface water sewer will be adequately treated via SuDS measures, hydro-brake (or equivalent) and oil/water interceptor / separator to ensure there is no long-term negative impact to the WFD water quality status of the receiving watercourse. The SuDS and proposed measures have been designed in detail with the ultimate aim of protecting the hydrological (& hydrogeological) environment. The SuDS and project design measures will be maintained correctly as per specifications to ensure long-term / on-going integrity of same.

The residual effect on human health and populations during the operation phase is considered to be **neutral, imperceptible** and **short-term**.

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6.8 WORST CASE SCENARIO

Worst case scenarios envisioned are extreme occurrences of the potential effects identified above in conjunction with failure of mitigation measures including:

- Significant contamination event.
- Flooding due to extreme event or unsuitable drainage measures.

Given the scale of the site, low risk flood zoning and relatively standard nature of the works involved the likelihood of a “worst case” event is extremely low.

6.9 MONITORING OR REINSTATEMENT

The management of hydrology during the construction phase will be monitored by the Contractor to ensure compliance with above-listed mitigation measures, and relevant water legislation and local authority requirements.

6.9.1 CONSTRUCTION PHASE

During construction phase the following monitoring measures will be considered:

- A riparian buffer zone applies along the stream boundary with Silt interception.
- Contractors will carry out regular inspections to confirm compliance with the CEMP. Daily inspections by contractors will address potential environmental impacts including dust, litter, waste management and general housekeeping.
- Regular inspection of surface water run-off and sediments controls (e.g., silt remediation treatment e.g. silt traps/fence or equivalent). Inspection and maintenance of the silt fences during construction phase is crucial to ensuring that they work as intended. They will remain in place throughout the entire.
- Soil sampling to confirm disposal options for excavated soils in order to avoid contaminated water run-off; and
- Regular inspection or auditing of construction / mitigation measures (e.g., concrete pouring, refuelling, etc).
- Silt Remediation treatment system.

6.9.2 OPERATIONAL PHASE

No future surface water monitoring is proposed for the proposed development due to the low hazard potential at the site.

Oil / hydrocarbon / petrol separators or interceptors will be maintained and cleaned out in accordance with the manufacturer’s instructions.

Maintenance of the surface water drainage system and foul sewers as per normal urban developments is recommended to minimise any accidental discharges to surface water.

6.10 INTERACTIONS

Due to the inter-relationship between land, soils , geology, hydrogeology and hydrology, the assessed impacts and mitigation measures discussed will be considered applicable to both chapters.

This section discusses interactions between this Chapter and other specialist environmental topics considered in this EIAR. The main interactions of importance to land, soils, geology and hydrogeology

relate to Biodiversity (Chapter 4), Land, soil, geology, hydrogeology (Chapter 5), and Air Quality (Chapter 7) as follows;

6.10.1 BIODIVERSITY

The proposed development may have temporary negative impacts on biodiversity at site level during construction with positive impacts following maintenance of the riparian corridor. There is no potential for impacts on water quality within European Designated sites.

6.10.2 CLIMATE AND FLOOD RISK

The proposed development will not have negative impact on flood risk as a result of climate change. The proposed development is located within Flood Zone C. The proposed drainage plan incorporates adequate attenuation taking consideration of a climate safety factor.

6.10.3 LAND, SOIL, GEOLOGY, AND HYDROGEOLOGY

There will be a reduced recharge to the underlying aquifer due to hard cover and installation of a drainage system.

6.11 CUMULATIVE IMPACTS

The cumulative impact of the proposed development with any/all relevant other planned or permitted developments are discussed below.

Existing developments that are already built and in operation contribute to the characterisation of the baseline environment. As such any further environmental impacts that the proposed development may have in addition to these already constructed and operational developments has been assessed in the preceding sections of this chapter.

Other projects in the wider area include:

- Previous phases of the masterplan site: Phase 3A, Phase 3B and Phase 3C Ladywell;
- Dean Swift Property Holdings Unlimited Company (Planning Ref. LRD0006/S3); and
- Harvest Lodge Distilleries LTD (Planning Ref. F22A/0033).

This section has been prepared with reference to the list of other developments in the vicinity. Neither the development proposed, nor any other developments will give rise to any significant impacts on surface water receptors and there are no predicted cumulative impacts in relation to surface water receptors in terms of water quality and flow, as a result of the proposed development in combination with existing / proposed plans or projects.

6.11.1 CONSTRUCTION PHASE

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place in the area.

In relation to the potential cumulative impact on hydrology during the construction phases, the construction works which would have potential cumulative impacts are as follows:

- Surface water run-off during the construction phase may contain increased silt levels or become polluted from construction activities. Run-off containing large amounts of silt can cause damage to surface water systems and receiving watercourses;

- Stockpiled material will be stored on hardstand away from surface water drains, and gullies will be protected during works to ensure there is no discharge of silt-laden water into the surrounding surface water drainage system;
- Contamination of local water sources from accidental spillage and leakage from construction traffic and construction materials is possible unless project-specific measures are put in place for each development and complied with.

The works contractors for other planned or permitted developments will be obliged to ensure that measures are in place to protect soil and water quality in compliance with legislative standards for receiving water quality (European Communities Environmental Objectives (Surface Water) Regulations (S.I. 272 of 2009 and S.I. 77 of 2019)).

The implementation of mitigation and monitoring measures detailed here as well as the compliance of the above permitted development with their respective planning conditions, will ensure there will be minimal cumulative potential for change to the hydrological environment during the construction phase of the proposed development. The residual cumulative impact of the proposed development in combination with other planned or permitted developments can therefore be considered to be **neutral, imperceptible, and short-term**.

6.11.2 OPERATIONAL PHASE

In relation to the potential cumulative impact on hydrology during the operational phases, the operational activities which would have potential cumulative impacts are as follows:

Increased hard standing areas will reduce local recharge to ground and increase surface water run-off potential if not limited to the green field run-off rate from the Site. Cumulatively this development and others in the area will result in localised reduced recharge to ground and increase in surface run-off. Increase in wastewater loading and water supply requirement is an impact of all development. Each development will require approval from the Uisce Eireann (formerly IW, Irish Water) confirming available capacity in the water and wastewater infrastructure. The surface water and foul drainage infrastructure and water supply requirements for the proposed development have been designed to accommodate the proposed development and a confirmation of feasibility received.

Development will result in an increase in hard standing which will result in localised reduced recharge to ground and increase in run-off rate. Each permitted development is required by the Local Authority and Uisce Eireann to comply with the Local Authority and Uisce Eireann requirements by providing suitable attenuation on-site and ensure that there is no increase in off-site flooding as a result of the development in question.

All developments are required to operate in compliance with relevant legislation - Water Framework Directive and Surface water Regulations. All developments are required to ensure they do not have an impact on the receiving water environment in accordance with the relevant legislation (Water Framework Directive and associated legislation, (European Communities Environmental Objectives (Surface Water) Regulations (S.I. 272 of 2009 and S.I. 77 of 2019)) such that they would be required to manage run-off quality.

The implementation of design and mitigation measures detailed in Section 6.6 as well as the compliance of the above permitted development with their respective planning conditions, will ensure there will be minimal cumulative potential for change in surface water during the operational phase of the proposed development. The residual cumulative impact of the proposed development in combination with other planned or permitted developments can therefore be considered to be **neutral, imperceptible and long-term**.

6.12 DIFFICULTIES ENCOUNTERED

There were no difficulties encountered during the preparation of this report.

6.13 SUMMARY

There will be ***no long-term residual impact*** on hydrological receptors, either within or in the vicinity of the proposed development as a result of the proposed development.

6.14 REFERENCES

- CIRIA (2001). Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors.
- CIRIA (2005). Environmental Good Practice on Site (C650).
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- Department of Housing, Planning & Local Government (2018). River Basin Management Plan for Ireland 2018 – 2021.
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7.0 AIR QUALITY

7.1 INTRODUCTION

This chapter of the EIAR was prepared to assess the potential significant effects on air quality associated with the proposed development at Ladywell, Balbriggan, Co. Dublin.

It should be read in conjunction with Ch. 11 Material Assets - Traffic and the standalone Traffic and Transportation Assessment (Transport Insights, 2024) submitted as part of the planning application.

7.2 EXPERTISE & QUALIFICATIONS

This chapter was completed by Aisling Cashell, an Environmental Consultant in the air quality section of AWN Consulting Ltd. She holds a BA and an MAI in Civil, Structural and Environmental Engineering from Trinity College Dublin. She is a member of Engineers Ireland. She has been specialising in the area of air quality, climate and sustainability for 1 year and has prepared air quality and climate assessments for inclusion within EIARs for residential and commercial developments such as Twenties Lane (Planning Application Ref: 22713), Cherrywood T13 (Planning Application Ref: DZ23A/0028), Corballis Donabate LRD (Planning Application Ref: LRD0017/S3), The Paddocks (Planning Application Ref: 2360349), and Dublin Airport Authority.

This chapter was also prepared and reviewed Dr. Jovanna Arndt, a Senior Environmental Consultant in the air quality and climate section of AWN Consulting. She has been specialising in the area of air quality and climate over 7 years and has prepared air quality and climate assessments for inclusion within EIARs for residential developments such as Twenties Lane (Planning Application Ref: 22713), Cherrywood T13 (Planning Application Ref: DZ23A/0028), Corballis Donabate LRD (Planning Application Ref: LRD0017/S3), commercial and industrial developments by Dublin Airport Authority, Zoetis, Ipsen, Merck Millipore, Greener Ideas Limited and Abbvie, as well as renewable energy developments such as Codling Wind Park and the Cúil Na Móna Anaerobic Digestion Facility. She also specialises in assessing air quality impacts using air dispersion modelling of transportation schemes such as BusConnects Dublin, major Highways England Road schemes and major rail infrastructure in the form of High Speed 2 (HS2 in the UK). She has prepared air dispersion modelling assessments of emissions from data centres, energy centres and the chemical industry as part of EPA Industrial Emissions Licences for Microsoft, Greener Ideas Limited, Merck Millipore, Lilly Limerick, Chemifloc, Takeda, Kingspan and Kilshane Energy. She has also provided Air Quality Action Plan (AQAP) and Air Quality Management Area (AQMA) support to several UK councils and assessed the air quality impacts of potential Clean Air Zones in the UK.

7.3 DESCRIPTION OF THE PROPOSED DEVELOPMENT

The proposed development consists of a large-scale residential development on an overall site of approx. 7.15 ha at the lands at Ladywell in Balbriggan, Co. Dublin. The full description of the development is available in Ch. 2 Project Description and Alternatives of this Environmental Impact Assessment Report (EIAR).

7.3.1 ASPECTS RELEVANT TO THIS ASSESSMENT

During the construction phase construction dust emission have the potential to impact air quality. Dust emissions will primarily occur as a result of site preparation works, earthworks and the movement of trucks on site and exiting the site. There is also the potential for engine emissions from site vehicles and machinery to impact air quality. Construction phase impacts will be short-term in duration.

Engine emissions from vehicles accessing the site have the potential to impact air quality during the operational phase of the development through the release of NO₂, PM₁₀ and PM_{2.5}. Operational phase impacts will be long-term in duration.

7.4 METHODOLOGY

7.4.1 RELEVANT LEGISLATION & GUIDANCE

The principal guidance and best practice documents used to inform the assessment of potential impacts on Air Quality is summarised below.

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 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).

7.4.1.1 Ambient Air Quality Standards

In order to reduce the risk to health from poor air quality, National and European statutory bodies, the Department of the Environment, Heritage and Local Government (DEHLG) in Ireland 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. The limit values for NO₂, PM₁₀, and PM_{2.5} are relevant to this assessment. 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}. The applicable limit values for NO₂, PM₁₀, and PM_{2.5} are set out in Table 7.1.

Table 7.1: Ambient Air Quality Standards & TA Luft

Pollutant	Regulation ^{Note 1}	Limit Type	Value
Dust Deposition	TA Luft (German VDI, 2002)	Annual average limit for nuisance dust	350 mg/m ² /day
Nitrogen Dioxide	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 µg/m ³
		Annual limit for protection of human health	40 µg/m ³
Particulate Matter (as PM ₁₀)	2008/50/EC	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 µg/m ³ PM ₁₀
		Annual limit for protection of human health	40 µg/m ³ PM ₁₀
Particulate Matter (as PM _{2.5}) – Stage 1	2008/50/EC	Annual limit for protection of human health	25 µg/m ³ PM _{2.5}
Particulate Matter (as PM _{2.5}) – Stage 2 ^{Note 2}	2008/50/EC	Annual limit for protection of human health	20 µg/m ³ PM _{2.5}

^{Note 1} EU 2008/50/EC – Clean Air for Europe (CAFE) Directive replaces the previous Air Framework Directive (1996/30/EC) and daughter directives 1999/30/EC and 2000/69/EC

^{Note 2} Stage 2 indicative limit value for PM_{2.5} to be applied from 1 January 2020 after review by the European Commission

In April 2023, the Government of Ireland published the Clean Air Strategy for Ireland (Government of Ireland, 2023), which provides a high-level strategic policy framework needed to reduce air pollution. The strategy commits Ireland to achieving the 2021 WHO Air Quality Guidelines Interim Target 3 (IT3) by 2026, the IT4 targets by 2030 and the final targets by 2040 (shown in Table 7.2). The strategy notes that a significant number of EPA monitoring stations observed air pollution levels in 2021 above the WHO targets; 80% of these stations would fail to meet the final PM_{2.5} target of 5 µg/m³ (WHO, 2021). The strategy also acknowledges that “*meeting the WHO targets will be challenging and will require legislative and societal change, especially with regard to both PM_{2.5} and NO₂*”. Ireland will revise its air quality legislation in line with the proposed EU revisions to the CAFE Directive, which will set interim 2030 air quality standards and align the EU more closely with the WHO targets. At present, the applicable standards for assessing compliance in relation to air quality are those outlined in Table 7.1.

Table 7.2: WHO Air Quality Guidelines

Pollutant	Regulation	Limit Type	IT3 (2026)	IT4 (2030)	Final Target (2040)
NO ₂	WHO Air Quality Guidelines	24-hour limit for protection of human health	50µg/m³ NO ₂	50µg/m³ NO ₂	25µg/m³ NO ₂
		Annual limit for protection of human health	30µg/ m³ NO ₂	20µg/ m³ NO ₂	10µg/m³ NO ₂
PM (as PM ₁₀)		24-hour limit for protection of human health	75µg/ m³ PM ₁₀	50µg/m³ PM ₁₀	45µg/m³ PM ₁₀
		Annual limit for protection of human health	30µg/ m³ PM ₁₀	20µg/ m³ PM ₁₀	15µg/m³ PM ₁₀
PM (as PM _{2.5})		24-hour limit for protection of human health	37.5µg/m³ PM _{2.5}	25µg/m³ PM _{2.5}	15µg/m³ PM _{2.5}
		Annual limit for protection of human health	15µg/m³ PM _{2.5}	10µg/m³ PM _{2.5}	5µg/m³ PM _{2.5}

7.4.1.2 Dust Deposition Guidelines

The concern from a health perspective is focused on particles of dust, which are less than 10 microns, and the EU ambient air quality standards outlined in Section 7.4.1.1 have set ambient air quality limit values for PM₁₀ and PM_{2.5}.

With regard to larger dust particles that can give rise to nuisance dust, there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction phase of a development in Ireland.

However, guidelines for dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission level for dust deposition of 350 mg/m²/day averaged over a one-year period at any receptors outside the site boundary. The TA-Luft standard has been applied for the purpose of this assessment based on recommendations from the EPA in Ireland in the document titled 'Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals) (EPA, 2006). The document recommends that the TA-Luft limit of 350 mg/m²/day be applied to the site boundary of quarries. This limit value can be implemented with regard to dust impacts from construction of the proposed development.

7.4.1.3 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 7.3 below. These criteria have been adopted for the proposed development to predict the impact of NO₂, PM₁₀ and PM_{2.5} emissions as a result of the proposed development.

Table 7.3: Air Quality Significance Criteria

Long Term Average Concentration at Receptor in Assessment Year	% Change in Concentration Relative to Air Quality Limit Value (AQLV)			
	1%	2-5%	6-10%	>10%
75% or less of AQLV	Neutral	Neutral	Slight	Moderate
76 – 94% of AQLV	Neutral	Slight	Moderate	Moderate
95 – 102% of AQLV	Slight	Moderate	Moderate	Substantial
103 – 109% of AQLV	Moderate	Moderate	Substantial	Substantial
110% or more of AQLV	Moderate	Substantial	Substantial	Substantial

Source: Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106 (TII, 2022)

7.4.2 SITE SURVEYS/INVESTIGATIONS

No on-site surveys were required for the air quality assessment. The baseline air quality environment was established using available long-term EPA monitoring data for representative locations (see Section 7.5.2).

7.4.3 CONSTRUCTION PHASE METHODOLOGY

7.4.3.1 Construction Traffic Assessment

Construction phase traffic has the potential to impact 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 the approach can be applied to any development that causes a change in traffic.

- 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;
- A change in road alignment by 5m or greater.

The construction stage traffic will not increase by 1,000 AADT or 200 HDV AADT and therefore does not meet the above scoping criteria. In addition, there are no proposed changes to the traffic speeds or road alignment. As a result, a detailed air assessment of construction stage traffic emissions has been scoped out from any further assessment as there is no potential for significant impacts to air quality.

7.4.3.2 Construction Dust Assessment

The Institute of Air Quality Management in the UK (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction*' (IAQM, 2024) outlines an assessment method for predicting the impact of dust emissions from construction activities based on the scale and nature of the works and the sensitivity of the area to dust impacts. The IAQM methodology has been applied to the construction phase of this development in order to predict the likely risk of dust impacts in the absence of mitigation measures and to determine the level of site-specific mitigation required. The use of UK guidance is recommended by Transport Infrastructure Ireland in their guidance document *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022).

The major dust generating activities are divided into four types within the IAQM guidance (IAQM, 2024) to reflect their different potential impacts. These are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (transport of dust and dirt from the construction site onto the public road network).

The magnitude of each of the four categories is divided into large, medium or small scale depending on the nature of the activities involved. The magnitude of each activity is combined with the overall sensitivity of the area to determine the risk of dust impacts from site activities. This allows the level of site-specific mitigation to be determined.

7.4.4 OPERATIONAL PHASE METHODOLOGY

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 7.4.3.1 were used to determine if any road links are affected by the proposed development and require inclusion in a detailed air quality modelling assessment. The proposed development will not result in the operational phase traffic increasing by more than 1,000 AADT. In addition, there are no proposed changes to the traffic speeds or road alignment. Therefore, no road links impacted by the proposed development satisfy the screening criteria. A detailed air quality modelling assessment of operational phase traffic emissions was not necessary as there is no potential for significant impacts to local air quality.

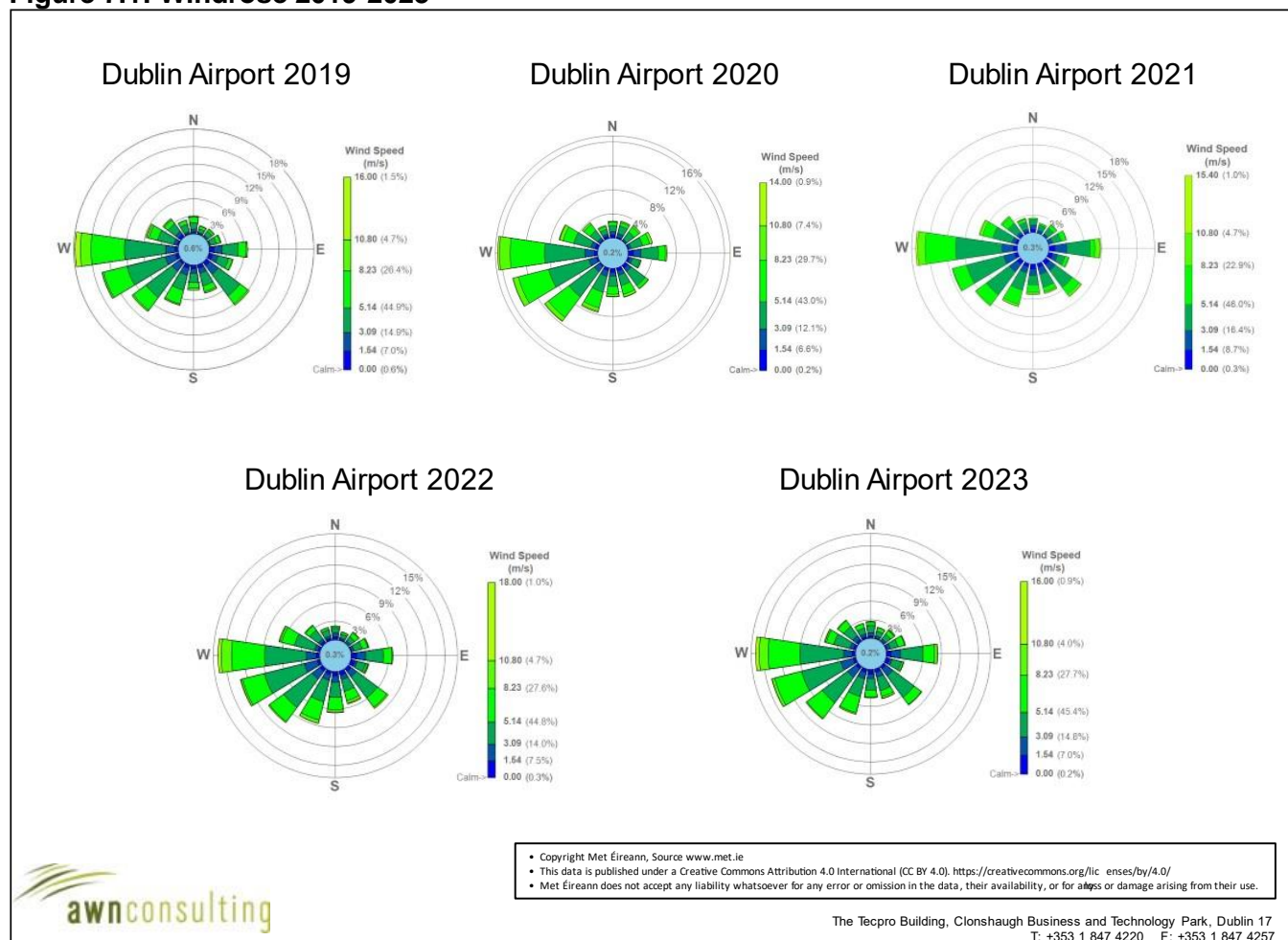
7.5 BASELINE ENVIRONMENT

7.5.1 METEOROLOGICAL DATA

A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels) (WHO, 2006). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to PM_{10} , the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than $PM_{2.5}$) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles ($PM_{2.5}$ - PM_{10}) will actually increase at higher wind speeds. Thus, measured levels of PM_{10} will be a non-linear function of wind speed.

The nearest representative weather station collating detailed weather records is Dublin Airport meteorological station, which is located approximately 19 km south of the site. Dublin Airport meteorological data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (see Figure 7.1). For data collated during five representative years (2019 – 2023), the predominant wind direction is westerly to south-westerly with a mean wind speed of 5.4 m/s over the 30-year period 1991 – 2020 (Met Éireann, 2024).

Figure 7.1: Windrose 2019-2023



(Source : Met Éireann, 2024)

7.5.2 BASELINE 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 2022*” (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, 2024).

As part of the implementation of the Framework Directive on Air Quality (1996/62/EC), four air quality zones have been defined in Ireland for air quality management and assessment purposes (EPA, 2024). Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 23 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000, is defined as Zone D.

In terms of air monitoring and assessment, the proposed development site is within Zone C (EPA, 2024). The long-term monitoring data has been used to determine background concentrations for the key pollutants in the region of the proposed development. The background concentration accounts for all non-traffic derived emissions (e.g. natural sources, industry, home heating etc.). Data for 2020 has been included for indicative purposes only, it has not been used in determining background pollutant levels as the data is not considered representative due to the COVID-19 restrictions that were in place at the time.

7.5.2.1 NO₂

Long-term NO₂ monitoring was carried out at three Zone C locations for the period 2018 – 2022, Kilkenny, Portlaoise and Dundalk (EPA, 2023). Annual mean concentrations of NO₂ range from 4 – 14 µg/m³ over the 2018 – 2022 period (Table 7.4). Long term average concentrations are significantly below the annual average limit of 40 µg/m³. Based on the above information, a conservative estimate of the current background NO₂ concentration in the region of the proposed development is 9 µg/m³.

Table 7.4: Trends in Zone C Air Quality – Nitrogen Dioxide (NO₂)

Station	Averaging Period ^{Note 1}	Year				
		2018	2019	2020	2021	2022
Kilkenny	Annual Mean NO ₂ (µg/m ³)	6	5	4	4	5
	Max 1-hr NO ₂ (µg/m ³)	71	59	52	51	54
Portlaoise	Annual Mean NO ₂ (µg/m ³)	11	11	8	8	9
	Max 1-hr NO ₂ (µg/m ³)	119	77	69	60	71
Dundalk	Annual Mean NO ₂ (µg/m ³)	14	12	10	11	10
	Max 1-hr NO ₂ (µg/m ³)	91	144	204	165	262

Note 1 Annual average limit value - 40 µg/m³ and 1-hour limit value - 200 µg/m³ (EU Council Directive 2008/50/EC & S.I. No. 739 of 2022).

7.5.2.2 PM₁₀

Continuous PM₁₀ monitoring was carried out at four Zone C locations from 2018 – 2022, Kilkenny, Ennis, Portlaoise and Dundalk. Concentrations range from 11 – 20 µg/m³ over the period (Table 7.5). Average concentrations across the five years (2018 to 2022) were 19 µg/m³ for Ennis, 12 µg/m³ for Portlaoise and 13 µg/m³ for Dundalk. Hence, long term concentrations are significantly below the annual limit value of 40 µg/m³. In addition, there were at most 21 exceedances (in Ennis) of the 24-hour limit value of 50 µg/m³ in 2021, albeit 35 exceedances are permitted per year (EPA, 2024). Based on the EPA data, an estimate of the current background PM₁₀ concentration in the region of the development is 15 µg/m³.

Table 7.5: Trends in Zone C Air Quality – PM₁₀

Station	Averaging Period ^{Note 1}	Year				
		2018	2019	2020	2021	2022
Kilkenny	Annual Mean PM ₁₀ (µg/m ³)	-	18	18	17	18
	24-hr Mean > 50 µg/m ³ (days)	-	7	1	2	2
Ennis	Annual Mean PM ₁₀ (µg/m ³)	16	18	20	19	20
	24-hr Mean > 50 µg/m ³ (days)	4	12	19	17	21
Portlaoise	Annual Mean PM ₁₀ (µg/m ³)	11	15	12	11	12
	24-hr Mean > 50 µg/m ³ (days)	1	0	0	1	0
Dundalk	Annual Mean PM ₁₀ (µg/m ³)	15	14	13	12	12
	24-hr Mean > 50 µg/m ³ (days)	0	2	2	0	2

^{Note1} Annual average limit value - 40 µg/m³ and Daily limit value - 50 µg/m³ (EU Council Directive 2008/50/EC & S.I. No. 739 of 2022).

7.5.2.3 PM_{2.5}

PM_{2.5} levels in Bray, Carlow and Ennis were monitored over the period 2018 – 2022 (Table 7.6). Average concentrations ranged from 5 – 16 µg/m³ (EPA, 2023). Based on the EPA data, and the overall 5-year average concentration for the three Zone C sites, the existing PM_{2.5} concentration in the region of the proposed development was estimated at 9 µg/m³.

Table 7.6: Trends in Zone C Air Quality – PM_{2.5}

Station	Averaging Period ^{Note 1}	Year				
		2018	2019	2020	2021	2022
Bray	Annual Mean PM ₁₀ (µg/m ³)	6	7	5	6	6
Carlow	Annual Mean PM ₁₀ (µg/m ³)	8	8	7	7	7
Ennis	Annual Mean PM ₁₀ (µg/m ³)	10	14	14	15	16

^{Note1} Annual average limit value - 40 µg/m³ (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).

7.5.2.4 Summary

Based on the above information the air quality in Zone C locations, such as the Balbriggan area, is generally good, with concentrations of the key pollutants generally well below the relevant limit values. However, the EPA have indicated that road transport emissions are contributing to increased levels of NO₂ with the potential for breaches in the annual NO₂ limit value in future years at locations within urban centres and roadside locations. In addition, burning of solid fuels for home heating is contributing to increased levels of particulate matter (PM₁₀ and PM_{2.5}). The EPA predict that exceedances in the particulate matter limit values are likely in future years if burning of solid fuels for residential heating continues (EPA, 2024).

The current background concentrations have been used in the operational phase air quality assessment for both the Opening Year and Design Year as a conservative approach in order to predict pollutant concentrations in future years. This is in line with the TII methodology (TII, 2022).

7.5.3 SENSITIVITY OF THE RECEIVING ENVIRONMENT

In line with the UK Institute of Air Quality Management (IAQM) guidance document ‘*Guidance on the Assessment of Dust from Demolition and Construction*’ (IAQM, 2024) prior to assessing the impact of dust from a proposed development the sensitivity of the area must first be assessed as outlined below. Both receptor sensitivity and proximity to proposed works areas are taken into consideration. For the purposes of this assessment, high sensitivity receptors are regarded as residential properties where people are likely to spend the majority of their time, schools and hospitals.

In terms of receptor sensitivity to dust soiling, there are a small number of high sensitivity residential properties within 100m of the site boundary (see Figure 7.2). There are 80 properties within 100m, 33 within 50m and 3 within 20m of the site boundary. Therefore, the overall sensitivity of the area to dust soiling impacts is considered **medium** based on the IAQM criteria outlined in Table 7.7.

Table 7.7: Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from Source (m)			
		<20	<50	<100	>250
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

Source (IAQM, 2024) Guidance on the Assessment of Dust from Demolition and Construction

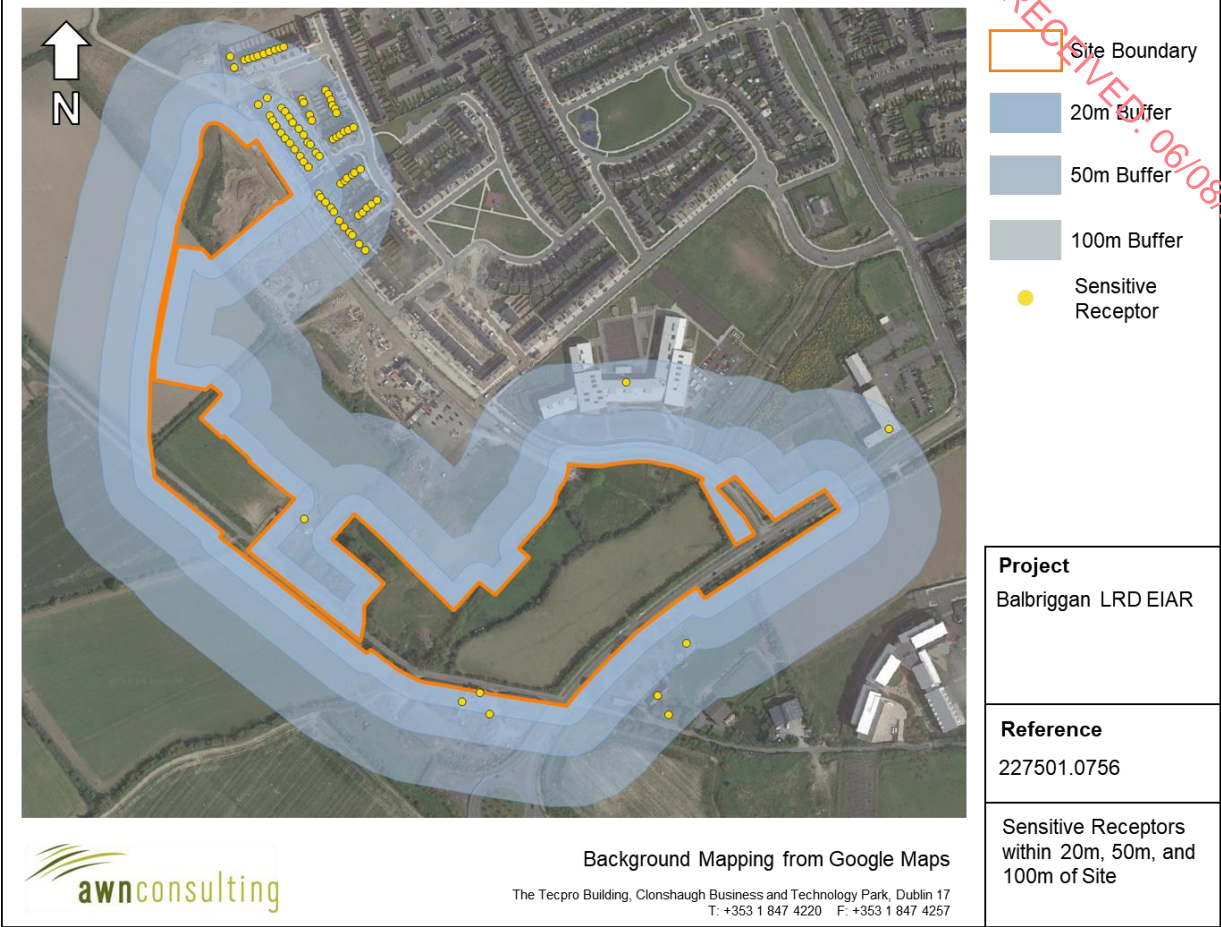
In addition to sensitivity to dust soiling, the IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to human health impacts. The criteria take into consideration the current annual mean PM₁₀ concentration, receptor sensitivity based on type (residential receptors are classified as high sensitivity) and the number of receptors affected within various distance bands from the construction works. A conservative estimate of the current annual mean PM₁₀ concentration in the vicinity of the proposed development is 15 µg/m³ and there are 3 no. high sensitivity receptor within 20m of the proposed development boundary (Figure 7.2). Based on the IAQM criteria outlined in Table 7.8, the worst-case sensitivity of the area to human health is considered **low**.

Table 7.8: Sensitivity of the Area to Dust Related Human Health Impacts

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration	Number of Receptors	Distance from Source (m)				
			<20	<50	<100	<200	<250
High	< 24 µg/m ³	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	< 24 µg/m ³	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	< 24 µg/m ³	>1	Low	Low	Low	Low	Low

Source (IAQM, 2024) Guidance on the Assessment of Dust from Demolition and Construction

Figure 7.2: Sensitive Receptors within 20m, 50m and 100m of Site Boundary



The IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to dust-related ecological impacts. Dust emissions can coat vegetation leading to a reduction in the photosynthesising ability of the plant as well as other effects. The guidance states that dust impacts to vegetation can occur up to 50m from the site and 50m from site access roads, up to 250m for the site entrance. The sensitivity of the area is determined based on the distance to the source, the designation of the site (European, National or local designation), and the potential dust sensitivity of the ecologically important species present.

The closest designated site is the North-West Irish Sea SPA 1.6km to the north-east of the site. High sensitivity ecological receptors are sites with European or National designation with particularly dust sensitive species present. These designated areas will be unaffected by dust emissions due to the distance from the works. The designated sites are all more than 50m away from the proposed development which is the area of potential impact as per IAQM guidelines (IAQM, 2024).

Figure 7.3: Ecological Sensitive Receptors within 2km of Site Boundary

7.6 THE 'DO NOTHING' SCENARIO

Under the 'Do Nothing' scenario the proposed development will not be constructed, no construction works associated with the proposed development will take place and the previously identified effects of fugitive dust and particulate matter emissions and emissions from equipment and machinery will not occur. However, as the site is part of a wider masterplan site construction phase dust emissions will still occur as a result of the previous development phases, albeit to a lesser extent due to the smaller area. The surrounding area is of medium - low sensitivity to dust impacts (see Section 7.5.3) and dust mitigation measures will be employed on the site, as required in the planning conditions for the previous phases of development. Therefore, dust emissions from the previous development phases will not cause a significant impact.

The Do-Nothing scenario associated with the operational phase of the development is assessed within Section 7.7.2 and it was found to be **direct, long-term, negative, and not significant**.

7.7 POTENTIAL SIGNIFICANT EFFECTS

7.7.1 CONSTRUCTION PHASE

7.7.1.1 Air Quality

The greatest potential impact on air quality during the construction phase of the proposed development is from construction dust emissions and the potential for nuisance dust. While construction dust tends to be deposited within 250m of a construction site, the majority of the deposition occurs within the first 50 m. The extent of any dust generation depends on the nature of the dust (soils, peat, sands, gravels, silts etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction. A review of Dublin Airport meteorological data indicates that the prevailing wind direction is south-westerly to southerly in direction and wind speeds are generally moderate in nature (see Section 7.5.1). In addition, dust generation is considered negligible on days where rainfall is greater than 0.2 mm. A review of historical 30-year average data for Dublin Airport meteorological station indicates that on average 200 days per year have rainfall over 0.2 mm (Met Éireann, 2024) and therefore it can be determined that 54% of the time dust generation will be reduced.

In order to determine the level of dust mitigation required during the proposed works, the potential dust emission magnitude for each dust generating activity needs to be taken into account, in conjunction with the previously established sensitivity of the area (see Section 7.5.3). As per Section 7.4.3, the major dust generating activities are divided into four types within the IAQM guidance to reflect their different potential impacts. These are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (transport of dust and dirt from the construction site onto the public road network).

7.7.1.1.1 Demolition

There are no demolition activities associated with the proposed development. Therefore, there is no demolition impact predicted as a result of the works.

7.7.1.1.2 Earthworks

Earthworks primarily involve excavating material, loading and unloading of materials, tipping and stockpiling activities. 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 or large based on the definitions from the IAQM guidance as transcribed below:

- **Large** Total site area > 110,000 m², 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 18,000 m² – 110,000 m², 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;
- **Small** Total site area < 18,000 m², 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 **medium** as the total site area will be between 18,000 m² and 110,000 m².

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The sensitivity of the area, as determined in Section 7.5.3, is combined with the dust emission magnitude for each dust generating activity to define the risk of dust impacts in the absence of mitigation. Using the assessment criteria from the IAQM (2024) in Table 7.9 and combining the medium dust emission magnitude with a medium sensitivity to dust soiling and low sensitivity to human health impacts results in a medium risk of dust soiling impacts and a low risk of dust-related human health impacts (Table 7.10). This is as a result of the proposed earthworks activities in the absence of mitigation.

Table 7.9: Criteria for Rating Risk of Dust Impacts – Earthworks (IAQM, 2024)

Sensitivity of Area	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 7.10: Risk of Dust Impacts – Earthworks

Receptor	Receptor Sensitivity	Dust Emission Magnitude – Earthworks	Risk of Dust-Related Impacts
Dust Soiling	Medium	Medium	Medium Risk
Human Health	Low		Low Risk

7.7.1.1.3 Construction

Dust emission magnitude from construction can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- Large Total building volume > 75,000 m³, on-site concrete batching, sandblasting;
- Medium Total building volume 12,000 m³ – 75,000 m³, potentially dusty construction material (e.g. concrete), on-site concrete batching;
- Small Total building volume < 12,000 m³, construction material with low potential for dust release (e.g. metal cladding or timber).

The dust emission magnitude for the proposed construction activities can be classified as **medium** as the total building volume is likely between 12,000 m³ and 75,000 m³. Using the criteria in Table 7.11 and combining the medium dust emission magnitude with a medium sensitivity to dust soiling and low sensitivity to human health impacts results in an overall medium risk of dust soiling impacts and a low risk of dust-related human health impacts (Table 7.12). This is as a result of the proposed construction activities in the absence of mitigation.

Table 7.11: Criteria for Rating of Risk of Dust Impacts – Construction (IAQM, 2024)

Sensitivity of Area	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 7.12: Risk of Dust Impacts – Construction

Receptor	Receptor Sensitivity	Dust Emission Magnitude – Construction	Risk of Dust-Related Impacts
Dust Soiling	Medium	Medium	Medium Risk
Human Health	Low		Low Risk

7.7.1.1.4 Trackout

Factors which determine the dust emission magnitude are vehicle size, vehicle speed, number of vehicles, road surface material and duration of movement. Dust emission magnitude from trackout can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- **Large** > 50 HGV (> 3.5 t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length > 100 m;
- **Medium** 20 - 50 HGV (> 3.5 t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 - 100 m;
- **Small** < 20 HGV (> 3.5 t) outward movements in any one day, surface material with low potential for dust release, unpaved road length < 50 m.

The dust emission magnitude for the proposed trackout can be classified as **small**, as at worst-case peak periods there will be less than 20 outward HGV movements per day. Using the criteria in Table 7.13 and combining the small dust emission magnitude with a medium sensitivity to dust soiling and low sensitivity to human health impacts results in an overall low risk of dust soiling impacts and a negligible risk of dust-related human health impacts (

Table 7.14). This is as a result of the proposed trackout activities in the absence of mitigation.

Table 7.13: Criteria for Rating of Risk of Dust Impacts – Trackout (IAQM, 2024)

Sensitivity of Area	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 7.14: Risk of Dust Impacts – Trackout

Receptor	Receptor Sensitivity	Dust Emission Magnitude – Trackout	Risk of Dust-Related Impacts
Dust Soiling	Medium	Small	Low Risk
Human Health	Low		Negligible

7.7.1.1.5 Summary of Dust Emission Risks

The risk of dust impacts as a result of the proposed development are summarised in Table 7.15 for each activity. The magnitude of risk determined is used to prescribe the level of site-specific mitigation required for each activity in order to prevent significant impacts occurring.

There is at most a medium risk of dust soiling and a low risk of human health impacts associated with the proposed works. Best practice dust mitigation measures appropriate for medium risk sites will be implemented to ensure there are no significant impacts at nearby sensitive receptors. In the absence of mitigation, dust impacts are predicted to be **direct, short-term, negative** and **slight**, which is overall **not significant** in EIA terms.

Table 7.15: Summary of Dust Impact Risk used to Define Site-Specific Mitigation

Potential Impact	Dust Emission Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Emission Magnitude	-	Medium	Medium	Small
Dust Soiling Risk	-	Medium Risk	Medium Risk	Low Risk
Human Health Risk	-	Low Risk	Low Risk	Negligible

7.7.1.2 Construction Phase Traffic Assessment

There is also the potential for traffic emissions to impact air quality in the short-term over the construction phase, particularly due to the increase in HGVs accessing the site. The construction stage traffic has been reviewed and a detailed air quality assessment has been scoped out as none of the road links impacted by the proposed development satisfy the TII scoping assessment criteria in Section 7.4.3.

It can therefore be determined that the construction stage traffic will have **direct, short-term, negative** and **imperceptible** impact on air quality, which is overall **not significant** in EIA terms.

7.7.2 OPERATIONAL PHASE

There is the potential for vehicles accessing the site to result in emissions of NO₂, PM₁₀ and PM_{2.5}. However, the proposed development will not increase traffic by 1,000 AADT or 200 HDV AADT. In addition, there are no proposed changes to the traffic speeds or road alignment. Therefore, no road links impacted by the proposed development satisfy the screening criteria (see Section 7.4.3). A detailed air quality assessment was scoped out for the operational stage of the development as per the TII screening criteria. Operational stage effects on air quality are predicted to be **direct, long-term, negative** and **imperceptible**, which is overall **not significant** in EIA terms.

7.7.3 CUMULATIVE EFFECTS

7.7.3.1 Construction Phase

According to the IAQM guidance (IAQM, 2024) should the construction phase of the proposed development coincide with the construction phase of any other development within 500m then there is the potential for cumulative construction dust impacts. A review of relevant planning applications within 500m of the site was conducted in order to identify sites with the potential for cumulative impacts. There were 2 no. sites identified which may have coinciding construction phases with that of the proposed development, these include:

- Previous phases of the masterplan site: Phase 3A, Phase 3B and Phase 3C Ladywell;
- Dean Swift Property Holdings Unlimited Company (Planning Ref. LRD0006/S3); and
- Harvest Lodge Distilleries LTD (Planning Ref. F22A/0033).

The proposed development has been assessed as having a medium risk of dust soiling impacts during the construction phase. A number of mitigation measures have been proposed in order to ensure significant dust impacts do not occur. Provided these measures are in place for the duration of the construction phase significant cumulative construction dust impacts are not predicted. Cumulative impacts to air quality will be **short-term, localised, negative** and **imperceptible**.

7.7.3.2 Operational Phase

The traffic data supplied for the operational phase assessment included data for cumulative development within the area. The traffic was reviewed, and a detailed air quality assessment of vehicle exhaust emissions was scoped out due to the low-level changes in traffic as a result of the proposed development (see Section 7.7.2). The effect on air quality during the operational phase of the proposed development, including the cumulative effect, will be **direct, long-term, negative** and **imperceptible**, which is overall **not significant** in EIA terms.

7.8 MITIGATION MEASURES

7.8.1 CONSTRUCTION PHASE MITIGATION

The proposed development has been assessed as having a medium risk of dust soiling impacts and a low risk of dust related human health impacts during the construction phase as a result of earthworks, construction and trackout activities (see Section 7.5.3). Therefore, the following dust mitigation measures shall be implemented during the construction phase of the proposed development. These measures are appropriate for sites with a medium risk of dust impacts and aim to ensure that no significant nuisance occurs at nearby sensitive receptors. The mitigation measures draw on best practice guidance from Ireland (DCC, 2018), the UK (IAQM (2024), BRE (2003), The Scottish Office (1996), UK ODPM (2002)) and the USA (USEPA, 1997). These measures will be incorporated into the overall Construction Environmental Management Plan (CEMP) prepared for the site. The measures are divided into different categories for different activities.

7.8.1.1 Communications

- Develop and implement a stakeholder communications plan that includes community engagement before works commence on site. Community engagement includes explaining the nature and duration of the works to local residents and businesses.
- 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 should also include head/regional office contact details.

7.8.1.2 Site Management

- During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions. Dry and windy conditions are favourable to dust suspension therefore mitigations must be implemented if undertaking dust generating activities during these weather conditions.
- A complaints register will be kept on site detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out.
- 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 logbook.
- Hold regular liaison meetings with other high risk construction sites within 250 m of the site boundary where feasible, 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.

7.8.1.3 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.

- 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.
- Cover, seed or fence stockpiles to prevent wind whipping.

7.8.1.4 Operating Vehicles / 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.
- Impose and signpost a maximum-speed-limit of 15 kph haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
- Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)

7.8.1.5 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.
- 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.

7.8.1.6 Waste Management

- No bonfires or burning of waste materials.

7.8.1.7 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.
- Only remove the cover in small areas during work and not all at once.
- During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil and thus suppress dust.

7.8.1.8 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 ensure that appropriate additional control measures are in place.

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- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.

7.8.1.9 Measures Specific to Trackout

- A speed restriction of 15 kph will be applied as an effective control measure for dust for on-site vehicles.
- 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 a site logbook.
- 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 permits.
- Access gates to be located at least 10 m from receptors where possible.

7.8.1.10 Monitoring

- Undertake daily on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results in the site inspection log. 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.
- 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.
- Monitoring of construction dust deposition along the site boundary to nearby sensitive receptors during the construction phase of the proposed development is recommended to ensure mitigation measures are working satisfactorily. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/m²/day during the monitoring period of 30 days (+/- 2 days).

7.8.2 OPERATIONAL PHASE MITIGATION

There is no mitigation required for the operational phase of the development as effects on air quality are predicted to be **direct, long-term, negative** and **not significant**.

7.9 RESIDUAL IMPACT ASSESSMENT

7.9.1 CONSTRUCTION PHASE

In order to minimise dust emissions during construction, a series of mitigation measures have been prepared. Once the dust minimisation measures outlined in Section 7.8.1 are implemented, the effect of the proposed development in terms of dust soiling will be **direct, short-term, negative** and **not significant**.

Best practice mitigation measures are proposed for the construction phase of the proposed development, which will focus on the proactive control of dust and other air pollutants, to minimise generation of emissions at source. The mitigation measures that will be put in place during construction will ensure that the impact complies with all EU ambient air quality legislative limit values, which are based on the protection of human health (see Table 7.1). Therefore, the predicted residual, dust-related, human health effect of the construction phase of the proposed development is **direct, short-term, negative** and **not significant**, which is overall **not significant** in EIA terms.

A detailed air quality assessment of the construction stage traffic has been scoped out (as per Section 7.4.3.1). It can therefore be determined that the construction stage traffic will have a **direct, short-term, negative** and **not significant** impact on air quality.

7.9.2 OPERATIONAL PHASE

The operational stage traffic has been reviewed and a detailed air quality assessment has been scoped out as none of the road links impacted by the proposed development satisfy the TII scoping assessment criteria in Section 7.4.3. Therefore, the operational phase effect on air quality and human health as a result of increased traffic is **direct, long-term, negative** and **imperceptible**, which is overall **not significant** in EIA terms.

7.9.3 CUMULATIVE RESIDUAL EFFECTS

7.9.3.1 Construction Phase

According to the IAQM guidance (IAQM, 2024) should the construction phase of the proposed development coincide with the construction phase of any other developments within 500m then there is the potential for cumulative construction dust related impacts to nearby sensitive receptors. However, provided the mitigation measures outlined in Section 7.8, are implemented throughout the construction phase of the proposed development significant cumulative dust impacts are not predicted. Impacts are predicted to be **direct, short-term, negative** and **not significant**.

7.9.3.2 Operational Phase

The effect on air quality during the operational phase of the proposed development will **direct, long-term, negative** and **imperceptible**, which is overall **not significant** in EIA terms. Therefore, there is no potential for significant cumulative effects with other development and the effect is predicted to be **direct, long-term, negative** and **imperceptible**, which is overall **not significant** in EIA terms.

7.10 RISK TO HUMAN HEALTH

Dust emissions from the construction phase of the proposed development have the potential to affect human health through the release of PM₁₀ and PM_{2.5} emissions. As per Section 7.5.3, the surrounding area is of low sensitivity to dust related human health impacts. It was determined that there is an overall low risk of dust related human health effects as a result of the construction phase of the proposed development.

Best practice mitigation measures are proposed for the construction phase of the proposed development which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the effect of construction of the proposed development is likely to be **direct, short-term, negative** and **not significant** with respect to human health.

Traffic related air emissions have the potential to affect air quality which can affect human health. As the operational phase air dispersion modelling has shown that emissions of air pollutants are significantly below the ambient air quality standards which are based on the protection of human health, impacts to human health are **direct, long-term, negative** and **not significant**.

7.11 RISK OF MAJOR ACCIDENTS OR DISASTERS

There are no likely risks of major accidents and disasters in relation to air quality associated with the proposed development due to the nature and scale of the development. The proposed development is residential in nature and will not require large scale quantities of hazardous materials or fuels.

7.12 WORST CASE SCENARIO

Worst case estimates have been used as part of this assessment. As a result, Section 7.9 details the worst-case impact for the proposed development.

7.13 INTERACTIONS

7.13.1 POPULATION AND HUMAN HEALTH

Air quality does not have a significant number of interactions with other topics. The most significant interactions are between population and human health and air quality. An adverse impact due to air quality in either the construction or operational phase has the potential to cause health and dust nuisance issues. The mitigation measures that will be put in place at the proposed development will ensure that the impact of the proposed development complies with all ambient air quality legislative limits. Therefore, the predicted impact is **direct, short-term, negative** and **not significant** with respect to population and human health during the construction phase and **direct, long-term, negative** and **not significant** during the operational phase.

7.13.2 TRAFFIC AND TRANSPORT

Interactions between air quality and traffic can be significant. With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The impacts of the proposed development on air quality are assessed by reviewing the change in annual average daily traffic on roads close to the site. In this assessment, the impact of the interactions between traffic and air quality are considered to be **direct, long-term, negative** and **not significant**.

7.13.3 CLIMATE

Air quality and climate have interactions due to the emissions from the burning of fossil fuels during the construction and operational phases generating both air quality and climate impacts. Air quality modelling outputs are utilised within the climate chapter. There is no significant impact on climate due to air quality; however, the sources of impacts on air quality and climate are strongly linked.

7.13.4 LAND, SOILS AND GEOLOGY

Construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential for interactions between air quality and land and soils in the form of dust emissions. With the appropriate mitigation measures to prevent fugitive dust emissions, it is predicted that there will be **no significant** interactions between air quality and land and soils.

7.13.5 BIODIVERSITY

Dust generation can occur during extended dry weather periods as a result of construction traffic. Dust suppression measures (e.g. dampening down) will be implemented as necessary during dry periods and vehicle wheel washes will be installed, for example. The works involve stripping of topsoil and excavations, which will remove some vegetation such as trees and scrub. It will also generate dust and potentially impact on the air quality in the locality. However, the generation of dust will be temporary during construction phase and is not anticipated to have a significant impact on biodiversity. Once the mitigation measures outlined in Section 7.8 of Chapter 7 are implemented dust related effects are predicted to be **direct, short-term, negative** and **imperceptible** which is overall **not significant** in EIA terms.

7.14 MONITORING

7.14.1 CONSTRUCTION PHASE

During working hours, dust control methods will be monitored in addition to the prevailing meteorological conditions.

Undertake daily on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results in the site inspection log. This should include regular dust soiling checks (by visual inspection) of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary.

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.

Monitoring of construction dust deposition along the site boundary to nearby sensitive receptors during the construction phase of the proposed development is recommended to ensure mitigation measures are working satisfactorily. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/m²/day during the monitoring period of 30 days (+/- 2 days).

7.14.2 OPERATIONAL PHASE

There is no proposed monitoring during the operational phase.

7.15 DIFFICULTIES ENCOUNTERED

There were no difficulties encountered in compiling this assessment.

7.16 REFERENCES

- BRE (2003) Controlling Particles, Vapours & Noise Pollution from Construction Sites
- Department of Housing, Planning & Local Government (DHPLG) (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment
- Department of the Environment Heritage and Local Government (DEHLG) (2004) Quarries and Ancillary Activities, Guidelines for Planning Authorities
- Dublin City Council (DCC) (2018) Air Quality Monitoring and Noise Control Unit's Good Practice Guide for Construction and Demolition
- Environmental Protection Agency (2006) Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals)
- Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports
- Environmental Protection Agency (2024) Air Quality Monitoring Report 2022 (& previous annual reports)
- European Commission (2017) Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report
- German VDI (2002) Technical Guidelines on Air Quality Control – TA Luft
- Government of Ireland (2023) Clean Air Strategy for Ireland
- Institute of Air Quality Management (IAQM) (2020) A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (Version 1.1)
- Institute of Air Quality Management (IAQM) (2024) Guidance on the Assessment of Dust from Demolition and Construction Version 2.1
- Met Éireann (2024) Met Éireann website: <https://www.met.ie/>
- The Scottish Office (1996) Planning Advice Note PAN50 Annex B: Controlling the Environmental Effects of Surface Mineral Workings Annex B: The Control of Dust at Surface Mineral Workings
- Transport Infrastructure Ireland (2022) Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106
- Transport Infrastructure Ireland (2024) TII Road Emissions Model (REM): Model Development Report – GE-ENV-01107
- UK Office of Deputy Prime Minister (ODPM) (2002) Controlling the Environmental Effects of Recycled and Secondary Aggregates Production Good Practice Guidance
- USEPA (1997) Fugitive Dust Technical Information Document for the Best Available Control Measures
- World Health Organisation (2006) Air Quality Guidelines - Global Update 2005 (and previous Air Quality Guideline Reports 1999 & 2000)
- World Health Organisation (2021) Air Quality Guidelines 2021

8.0 CLIMATE

8.1 INTRODUCTION

This chapter of the EIAR was prepared to assess the potential significant effects on climate associated with the proposed development at Balbriggan, Co. Dublin.

It should be read in conjunction with Ch. 7 Air Quality, Ch. 11 Material Assets - Traffic and the standalone Traffic and Transportation Assessment (Transport Insights Consulting Engineers, 2024), Ch. 13 Material Assets – Waste and the Site-Specific Flood Risk Assessment (Paul McGrail, 2024) submitted as part of the LRD planning application.

8.2 EXPERTISE & QUALIFICATIONS

This chapter was completed by Aisling Cashell, an Environmental Consultant in the air quality section of AWN Consulting Ltd. She holds a BA and an MAI in Civil, Structural and Environmental Engineering from Trinity College Dublin. She is a member of Engineers Ireland. She has been specialising in the area of air quality, climate and sustainability for 1 year and has prepared air quality and climate assessments for inclusion within EIARs for residential and commercial developments such as Twenties Lane (Planning Application Ref: 22713), Cherrywood T13 (Planning Application Ref: DZ23A/0028), Corballis Donabate LRD (Planning Application Ref: LRD0017/S3), The Paddocks (Planning Application Ref: 2360349), and Dublin Airport Authority.

This chapter was also prepared and reviewed Dr. Jovanna Arndt, a Senior Environmental Consultant in the Air Quality & Climate section of AWN Consulting. She has been specialising in the area of air quality and climate over 7 years and has prepared air quality and climate assessments for inclusion within EIARs for residential developments such as Twenties Lane (Planning Application Ref: 22713), Cherrywood T13 (Planning Application Ref: DZ23A/0028), Corballis Donabate LRD (Planning Application Ref: LRD0017/S3), commercial and industrial developments by Dublin Airport Authority, Zoetis, Ipsen, Merck Millipore, Greener Ideas Limited and Abbvie, as well as renewable energy developments such as Codling Wind Park and the Cúil Na Móna Anaerobic Digestion Facility. She also specialises in assessing air quality impacts using air dispersion modelling of transportation schemes such as BusConnects Dublin, major Highways England Road schemes and major rail infrastructure in the form of High Speed 2 (HS2 in the UK). She has prepared air dispersion modelling assessments of emissions from data centres, energy centres and the chemical industry as part of EPA Industrial Emissions Licences for Microsoft, Greener Ideas Limited, Merck Millipore, Lilly Limerick, Chemifloc, Takeda, Kingspan and Kilshane Energy. She has also provided Air Quality Action Plan (AQAP) and Air Quality Management Area (AQMA) support to several UK councils and assessed the air quality impacts of potential Clean Air Zones in the UK.

8.3 DESCRIPTION OF THE PROPOSED DEVELOPMENT

The proposed development consists of a large-scale residential development on an overall site of approx. 7.15 ha at the lands at Ladywell in Balbriggan, Co. Dublin. The full description of the development is available in Ch. 2 Project Description and Alternatives of this Environmental Impact Assessment Report (EIAR).

8.3.1 ASPECTS RELEVANT TO THIS ASSESSMENT

During the construction phase engine emissions from site vehicles and machinery have the potential to impact climate through the release of CO₂ and to a lesser extent, other greenhouse gases (GHGs). Embodied carbon of materials used in the construction of the development along with site activities will impact climate. Impacts to climate are assessed against Ireland's obligations under the EU 2030 GHG targets and sectoral emissions ceilings.

Engine emissions from vehicles accessing the site have the potential to impact climate during the operational phase of the development through the release of CO₂. Operational phase impacts will be long-term in duration. In addition, the vulnerability of the proposed development in relation to future climate change must be considered during the operational phase.

The climate assessment is divided into two distinct sections – a greenhouse gas assessment (GHGA) and a climate change risk assessment (CCRA).

- Greenhouse Gas Emissions Assessment (GHGA) – Quantifies the GHG emissions from a project over its lifetime. The assessment compares these emissions to relevant carbon budgets, targets and policy to contextualise magnitude; and
- Climate Change Risk Assessment (CCRA) – Identifies the impact of a changing climate on a project and receiving environment. The assessment considers a projects vulnerability to climate change and identifies adaptation measures to increase project resilience.

8.4 METHODOLOGY

8.4.1 RELEVANT LEGISLATION, POLICY & GUIDANCE

The assessment of potential impacts on climate has been prepared taking the relevant legislation, policy and guidance described in the following sections into consideration.

8.4.1.1 Legislation

In 2015, the Climate Action and Low Carbon Development Act 2015 (No. 46 of 2015) (Government of Ireland, 2015) was enacted (the 2015 Climate Act). The purpose of the Act was to enable Ireland “to pursue, and achieve, the transition to a low carbon, climate resilient and environmentally sustainable economy by the end of the year 2050” (3.(1) of No. 46 of 2015). This is referred to in the 2015 Climate Act as the “National Transition Objective”. The 2015 Climate Act made provision for a national low carbon transition and mitigation plan (now known as a Climate Action Plan), and a national adaptation framework. In addition, the 2015 Climate Act provided for the establishment of the Climate Change Advisory Council with the function to advise and make recommendations on the preparation of the national mitigation and adaptation plans and compliance with existing climate obligations.

The first Climate Action Plan (CAP) was published by the Irish Government in June 2019 (Government of Ireland, 2019). The Climate Action Plan 2019 (CAP19) outlined the current status across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and outlined the various broadscale measures required for each sector to achieve ambitious decarbonisation targets. The 2019 CAP also detailed the required governance arrangements for implementation including carbon-proofing of policies, establishment of carbon budgets, a strengthened Climate Change Advisory Council and greater accountability to the Oireachtas. The current Climate Action Plan is CAP24, published in December 2023 (DECC, 2023a).

Following on from Ireland declaring a climate and biodiversity emergency in May 2019, and the European Parliament approving a resolution declaring a climate and environment emergency in Europe in November 2019, the Government published the Climate Action and Low Carbon Development (Amendment) Act 2021 (hereafter referred to as the 2021 Climate Act) in March 2021 (Government of Ireland, 2021). The Climate Act was signed into Law on the 23rd of July of 2021, giving statutory effect to the core objectives stated within the first Climate Action Plan.

The purpose of the 2021 Climate Act is to provide for the approval of plans “to reduce the extent of further global warming, 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”. This is known as the

“national climate objective”, which supersedes the 2015 Climate Act “national transition objective”. The 2021 Climate Act will also “provide for carbon budgets and a decarbonisation target range for certain sectors of the economy”. The 2021 Climate Act defines the carbon budget as “the total amount of greenhouse gas emissions that are permitted during the budget period”.

In relation to carbon budgets, the 2021 Climate Action and Low Carbon Development (Amendment) Act states “A carbon budget, consistent with furthering the achievement of the national climate objective, shall be proposed by the Climate Change Advisory Council, finalised by the Minister and approved by the Government for the period of 5 years commencing on the 1 January 2021 and ending on 31 December 2025 and for each subsequent period of 5 years (in this Act referred to as a ‘budget period’)”. The carbon budget is to be produced for 3 sequential budget periods, as shown in Table 8.1. The carbon budget can be revised where new obligations are imposed under the law of the European Union or international agreements or where there are significant developments in scientific knowledge in relation to climate change. In relation to the sectoral emissions ceiling, the Minister for the Environment, Climate and Communications (the Minister for the Environment) shall prepare and submit to government the maximum amount of GHG emissions that are permitted in different sectors of the economy during a budget period and different ceilings may apply to different sectors. The sectoral emission ceilings for 2030 were published in the Climate Action Plan 2024 (CAP24) (DECC, 2023a) and are shown in Table 8.2. Industry and Buildings (Residential) have a 35% and 40% reduction requirement respectively and a 2030 emission ceiling of 4 Mt CO₂e¹³.

Table 8.1: 5-Year Carbon Budgets 2021-2025, 2026-2030 and 2031-2035 (DECC, 2023a)

Budget Period	Carbon Budget	Reduction Required
2021-2025	295 Mt CO ₂ e	Reduction in emissions of 4.8% per annum for the first budget period.
2026-2030	200 Mt CO ₂ e	Reduction in emissions of 8.3% per annum for the second budget period.
2031-2035	151 Mt CO ₂ e	Reduction in emissions of 3.5% per annum for the third provisional budget.

Table 8.2: Sectoral Emission Ceilings 2030 (DECC, 2023a)

Sector	Baseline (Mt CO ₂ e)	Carbon Budgets (Mt CO ₂ e)		2030 Emissions (Mt CO ₂ e)	Indicative Emissions % Reduction in Final Year of 2025- 2030 Period (Compared to 2018)
	2018	2021- 2025	2026- 2030		
Electricity	10	40	20	3	75
Transport	12	54	37	6	50
Built Environment - Residential	7	29	23	4	40
Built Environment - Commercial	2	7	5	1	45
Industry	7	30	24	4	35
Agriculture	23	106	96	17.25	25
Other (F-gases, waste, petroleum refining)	2	9	8	1	50
Land Use, Land-use Change and Forestry (LULUCF)	5	Reflecting the continued volatility for LULUCF baseline emissions to 2030 and beyond, CAP24 puts in place ambitious activity targets for the sector reflecting an EU-type approach.			
Total	68				

¹³ Mt CO₂e denotes million tonnes carbon dioxide equivalent.

Unallocated Savings	-	-	26	-5.25	-
Legally Binding Carbon Budgets and 2030 Emission Reduction Targets	-	295	200	-	51

8.4.1.2 Policy

In December 2023 the current Climate Action Plan, CAP24, was published (DECC, 2023a). This CAP builds on the progress of CAP23, which first published carbon budgets and sectoral emissions ceilings, and it aims to implement the required changes to achieve a 51% reduction in carbon emissions by 2030 and 2050 net zero goal. The CAP has six vital high impact sectors where the biggest savings can be made: renewable energy, energy efficiency of buildings, transport, sustainable farming, sustainable business and change of land-use. CAP24 states that the decarbonisation of Ireland's manufacturing industry is key for Ireland's economy and future competitiveness. There is a target to reduce the embodied carbon in construction materials by 10% for materials produced and used in Ireland by 2025 and by at least 30% for materials produced and used in Ireland by 2030. CAP24 states that these reductions can be brought about by product substitution for construction materials and reduction of clinker content in cement. Cement and other high embodied carbon construction elements can be reduced by the adoption of the methods set out in the Construction Industry Federation 2021 report Modern Methods of Construction. In order to ensure economic growth can continue alongside a reduction in emissions, the IDA Ireland will also seek to attract businesses to invest in decarbonisation technologies.

In April 2023 the Government published its *Long-Term Strategy on Greenhouse Gas Emissions Reductions* (DECC, 2023b). This strategy provides a long-term plan on how Ireland will transition towards net carbon zero by 2050, achieving the interim targets set out in the Climate Action Plan.

The Fingal County Council (FCC) Climate Action Plan 2024-2029 (FCC and Codema, 2024) outlines FCC's goals to mitigate GHG emissions and plans to prepare for and adapt to climate change. The FCC Climate Action Plan states that FCC aims to reduce car dependency by encouraging modal shifts from cars to active travel and more sustainable modes, including public transport and cycling. FCC states that it wishes to work with the relevant transportation bodies to introduce measures to achieve modal shifts.

The FCC Climate Action Plan highlights the risks that climate change poses to the transportation network, with risks mainly associated with extreme weather events. The FCC Climate Action Plan notes that cold spells and flooding (pluvial, fluvial coastal, etc) and have the greatest future risk when both the likelihood and consequence are accounted for. Increases in flooding will cause an inundation of residential properties, damages to commercial buildings and premises, and disruption of transport networks.

8.4.1.3 Guidance

The assessment of potential impacts on climate has been prepared in accordance with the most relevant principal guidance and best practice documents:

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018);
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022);
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);
- GE-GEN-01101: Guide to the Implementation of Sustainability for Transport Infrastructure Ireland Projects (TII, 2023);
- PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document (TII, 2022a);

- PE-ENV-01105: Climate Assessment Standard for Proposed National Roads (TII, 2022b);
- GE-ENV-01106: TII Carbon Assessment Tool for Road and Light Rail Projects and User Guidance Document (TII, 2022c);
- Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Commission, 2013);
- 2030 Climate and Energy Policy Framework (European Commission, 2014);
- Technical guidance on the Climate Proofing of Infrastructure in the Period 2021-2027 (European Commission, 2021a).
- 2030 EU Climate Target Plan (European Commission, 2021b);
- Climate Action and Low Carbon Development (Amendment) Act 2021 (the 2021 Climate Act) (No. 32 of 2021) (Government of Ireland, 2021).
- Climate Action Plan 2024 (DECC, 2023a);
- Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (hereafter referred to as the IEMA 2020 EIA Guide) (IEMA, 2020a);
- GHG Management Hierarchy (hereafter referred to as the IEMA 2020 GHG Management Hierarchy) (IEMA, 2020b);
- Assessing Greenhouse Gas Emissions and Evaluating their Significance (Institute of Environmental Management & Assessment (IEMA), 2022);
- Environmental Impact Assessment Guide to: Assessing GHG Emissions and Evaluating their Significance (hereafter referred to as the IEMA GHG Guidance) (IEMA, 2022); and
- UK Design Manual for Roads and Bridges (DMRB) Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 14 LA 114 Climate (Highways England, 2021).

8.4.2 SITE SURVEYS/INVESTIGATIONS

No surveys were required as part of the climate assessment.

8.4.3 GREENHOUSE GAS ASSESSMENT

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 with reference to EPA data on annual GHG emissions (see Section 8.6).

8.4.3.1 Construction Phase

PE-ENV-01104 (TII, 2022a) recommends the calculation of the construction stage GHG emissions, including embodied carbon, using the TII Online Carbon Tool (TII, 2022c). Embodied carbon refers to the sum of the carbon needed to produce a good or service. It incorporates the energy needed in the mining or processing of raw materials, the manufacturing of products and the delivery of these products to site.

The TII Online Carbon Tool (TII, 2022c) has been commissioned by TII to assess GHG emissions associated with road or rail projects in Ireland. The TII Carbon Tool (TII, 2022c) uses emission factors from recognised sources including the Civil Engineering Standard Method of Measurement (CESSM) Carbon and Price Book Database (CESSM, 2013), which can be applied to a variety of developments, not just road or rail. The use of the TII carbon tool is considered appropriate as the material types and construction activities employed by the proposed development are accounted for in the tool. The carbon emissions are calculated by multiplying the emission factor by the quantity of the material that will be used over the entire construction / maintenance phase. The outputs are expressed in terms of tCO₂e (tonnes of carbon dioxide equivalent).

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 Irish Green Building Council in partnership with One Click LCA Ltd. have developed the Carbon Designer for Ireland tool (One Click LCA Ltd., 2023) for use on Irish specific building projects. The Carbon Designer tool is promoted by the EPA and the Land Development Agency. OneClickLCA is certified to EN 15978, EN 15978, ISO 21931-1 & ISO 21929, and data requirements of ISO 14040 & EN 15804, and is LEED, BREEAM and PAS 2080 aligned. It allows users to assess the carbon impact of buildings at an early stage using typical default materials and values. Inputs to the tool include the gross floor area and number of stories above ground level along with the building frame type. Once the baseline is established using generic data, the tool allows for optioneering and optimization of the carbon impact. It highlights the key areas within the building with the highest carbon impact and provides options for lower carbon intensive materials. The Carbon Designer for Ireland tool has been used to assess the embodied carbon impact of the proposed development.

Reasonable conservative estimates have been used in this assessment where necessary to provide an estimate of the GHGs associated with the proposed development.

Information on the site clearance activities, land clearance, excavations, fuel usage during construction, waste quantities and construction traffic (material, staff and waste transport) were provided by the design team for input into the TII carbon tool and are also discussed in Ch. 11 Material Assets - Traffic and Ch. 13 Material Assets – Waste. This information was used to determine an estimate of the GHG emissions associated with the development.

Information on the apartment, maisonette and townhouse building areas for input into the OneClick tool was provided by the design team. The GHG emissions associated with the materials required (product stages, A1-A3, see below) for the houses, duplexes and bungalows were estimated based on the emission intensity ($\text{tCO}_2\text{e/m}^2$) calculated by the Glenveagh sustainability team as part of their Scope 3 emissions quantification for Glenveagh Properties PLC *Net Zero Transition Plan*, published in March 2023. Scope 1, Scope 2 and Scope 3 emissions are terms defined by GHG protocol which applied the most widely used greenhouse gas accounting standards (GHG Protocol, 2004).

- Scope 1 emissions come from sources that an organisation owns or controls directly, e.g. fuel use by vehicles.
- Scope 2 emissions come indirectly from the company's energy use, e.g. electricity.
- Scope 3 emissions are not produced by the company itself and are not the result of activities from assets owned or controlled by them, but by those that the company is indirectly responsible for up and down its value chain e.g. buying, using and disposing of products. Scope 3 emissions include all those not within Scope 1 and Scope 2.

Estimates of the fuel quantities needed for the construction phase were provided by the Marshall Yards Development Company Ltd (a subsidiary of Glenveagh Homes) sustainability team and are based on the overall fuel usage by Glenveagh Properties PLC in 2023.

The GHG assessment accounts for various components relating to the project during different life stages to determine the total impact of the development on climate. The reference study period (i.e. the assumed building life expectancy) for the purposes of the assessment is 50 years. Embodied carbon emissions are attributed to four main categories, taken from BS EN 15978. The categories are:

- Product Stages (category A1 to A3): The carbon emissions generated at this stage arise from extracting the raw materials from the ground, their transport to a point of manufacture and then the primary energy used (and the associated carbon impacts that arise) from transforming the raw materials into construction products. These stages have been included within the scope of this assessment.

- Construction (category A4 to A5): These carbon impacts arise from transporting the construction products to site, and their subsequent processing and assembly into the building. This has been included within the scope of the assessment. Information for these stages was incorporated into the TII tool.
- Use Stage (category B1 to B7): This covers a wide range of sources from the GHG emissions associated with the operation of the building (B1), maintenance (B2), repair (B3), refurbishment (B4) and replacement (B5) of materials, and operational energy use (B6) and water use (B7). Categories B1-B3, B6 and B7 are not included in the assessment scope of this study, as these are highly variable and dependent on individual users of the buildings during operation. Material refurbishment and replacement throughout the lifetime of the development (category B4 – B5) has been included within this assessment.
- End of Life Stages (category C1 to C4): The eventual deconstruction and disposal of the existing building at the end of its life takes account of the on-site activities of the demolition contractors. No 'credit' is taken for any future carbon benefit associated with the reuse or recycling of a material into new products. This stage is not included within the scope of this study due to the variability and uncertainty in deconstruction methods which may be in place at the end of the development's lifespan.

8.4.3.2 Operational Phase

Operational Traffic Emissions

Emissions from road traffic associated with the proposed development have the potential to emit carbon dioxide (CO₂) which will impact climate.

The Highways England DMRB guidance document in relation to climate impact assessments *LA 114 Climate* (Highways England, 2021) contains the following scoping criteria to determine whether a detailed climate assessment is required for a proposed project during the operational stage. If any of the road links impacted by the proposed development meet or exceed the below criteria, then further assessment is required.

- A change of more than 10% in AADT;
- A change of more than 10% to the number of heavy-duty vehicles; and
- A change in daily average speed of more than 20 km/hr.

The above DMRB scoping criteria will be used to determine whether a detailed modelling assessment of traffic emissions is required as part of the EIAR assessment. The proposed development will not cause a change in traffic of more than any of the above scoping criteria. Therefore, no detailed assessment was required as there is no potential for significant impacts.

Operational Phase Energy Use

The EU guidance (European Commission, 2013) also states indirect GHG emissions as a result of a development must be considered, which includes emissions associated with energy usage. A Climate Action Energy Statement was prepared by ENX Consulting Engineers in relation to the proposed development and is submitted separately with this planning application. The report outlines a number of measures which have been incorporated into the overall design of the development which will have the benefit of reducing the impact to climate where possible during operation. Information on some of the measures in relation to operational energy usage and sustainability measures has been supplied to inform the climate assessment.

8.4.3.3 Significance Criteria for GHGA

The Transport Infrastructure Ireland (TII) guidance document entitled PE-ENV-01104 Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical

Document (TII, 2022a) outlines a recommended approach for determining the significance of both the construction and operational phases of a development.

The significance of GHG effects set out in PE-ENV-01104 (TII, 2022a) is based on IEMA guidance (IEMA, 2022) which is consistent with the terminology contained within Figure 3.4 of the EPA's *Guidelines on the information to be contained in Environmental Impact Assessment Reports* (EPA, 2022).

The 2022 IEMA Guidance (IEMA, 2022) sets out the following principles for significance:

- When evaluating significance, all new GHG emissions contribute to a negative environmental impact; however, some projects will replace existing development or baseline activity that has a higher GHG profile. The significance of a project's emissions should be based on its net impact over its lifetime, which may be positive, negative or negligible;
- Where GHG emissions cannot be avoided, the goal of the EIA process should be to reduce the project's residual emissions at all stages; and
- Where GHG emissions remain significant, but cannot be further reduced, approaches to compensate the project's remaining emissions should be considered.

The criteria for determining the significance of effects are a two-stage process that involves defining the magnitude of the impacts and the sensitivity of the receptors (i.e. Ireland's National GHG targets). In relation to climate, there is no project specific assessment criteria, but the project will be assessed against the recommended IEMA significance determination. This takes account of any embedded or committed mitigation measures that form part of the design which should be considered.

TII (TII, 2022a) states that professional judgement must be taken into account when contextualising and assessing the significance of a project's GHG impact. In line with IEMA Guidance (IEMA, 2022), TII 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 zero¹⁴ by 2050"*.

Significance is determined using the criteria outlined in Table 8.3 (derived from Table 6.7 of PE-ENV-01104 (TII, 2022a)) along with consideration of 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 8.3: GHGA Significance Criteria

Effects	Significance Level	Description
Significant Adverse	Major Adverse	The project's GHG impacts are not mitigated; The project has not complied with Do Minimum standards set through regulation, nor provided reductions required by local or national policies; and No meaningful absolute contribution to Ireland's trajectory towards net zero.

¹⁴ Net Zero: "When anthropogenic emissions of greenhouse gases to the atmosphere are balanced by anthropogenic removals over a specified period." Net zero is achieved where emissions are first reduced in line with a 'science-based' trajectory with any residual emissions neutralised through offsets.

	Moderate Adverse	The project's GHG impacts are partially mitigated; The project has partially complied with Do Minimum standards set through regulation, and have not fully complied with local or national policies; and Falls short of full contribution to Ireland's trajectory towards net zero.
Not Significant	Minor Adverse	The project's GHG impacts are mitigated through 'good practice' measures; The project has complied with existing and emerging policy requirements; and Fully in line to achieve Ireland's trajectory towards net zero.
	Negligible	The project's GHG impacts are mitigated beyond design standards; The project has gone well beyond existing and emerging policy requirements; and Well 'ahead of the curve' for Ireland's trajectory towards net zero.
Beneficial	Beneficial	The project's net GHG impacts are below zero and it causes a reduction in atmosphere GHG concentration; The project has gone well beyond existing and emerging policy requirements; and Well 'ahead of the curve' for Ireland's trajectory towards net zero, provides a positive climate impact.

Ireland's carbon budgets can also be used to contextualise the magnitude of GHG emissions from the proposed development (TII, 2022a). The approach is based on comparing the net proposed development GHG emissions to the relevant carbon budgets (DECC, 2023a). With the publication of the Climate Action Act in 2021 and the Climate Action Plan 2024, sectoral carbon budgets have been published for comparison with the net GHG emissions from the proposed development over its lifespan. The relevant sector budgets are the Industry Buildings (Residential) sector, Transport sector, Electricity sector and Waste sector. The Industry and Buildings (Residential) sectors each emitted approximately 7 Mt CO₂e in 2018 and have a ceiling of 4 Mt CO₂e in 2030 which is a 35% and 40% reduction respectively over this period (see

Table 8.2). The Transport sector emitted approximately 12 Mt CO₂e in 2018 and has a ceiling of 6 Mt CO₂e in 2030 which is a 50% reduction over this period.

8.4.4 CLIMATE CHANGE RISK ASSESSMENT

The assessment involves determining the vulnerability of the proposed development to climate change. This involves an analysis of the sensitivity and exposure of the development to climate hazards which together provide a measure of vulnerability.

PE-ENV-01104 (TII, 2022a) states that the CCRA is guided by the principles set out in the overarching best practice guidance documents:

- EU (2021) Technical guidance on the climate proofing of Infrastructure in the Period 2021-2027 (European Commission, 2021a); and
- The Institute of Environmental Management and Assessment, Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (2nd Edition) (IEMA, 2020).

The baseline environment information provided in Section 8.6, future climate change modelling and input from other experts working on the proposed development (i.e. hydrologists) should be used in order to assess the likelihood of a climate risk.

First an initial screening CCRA based on the operational phase is carried out, according to the TII guidance PE-ENV-01104. This is carried out by determining the sensitivity of proposed development assets (i.e. receptors) and their exposure to climate change hazards.

The proposed development asset categories must be assigned a level of sensitivity to climate hazards. PE-ENV-01104 (TII, 2022a) provide the below list of asset categories and climate hazards to be considered. The asset categories will vary for project type and need to be determined on a development-by-development basis.

- **Asset Categories** Pavements; drainage; structures; utilities; landscaping; signs, light posts, buildings, and fences.
- **Climate Hazards** Flooding (coastal, pluvial, fluvial); extreme heat; extreme cold; wildfire; drought; extreme wind; lightning and hail; landslides; fog.

The sensitivity is based on a High, Medium or Low rating with a score of 1 to 3 assigned as per the criteria below.

- **High Sensitivity** The climate hazard will or is likely to have a major impact on the asset category. This is a sensitivity score of 3.
- **Medium Sensitivity** It is possible or likely the climate hazard will have a moderate impact on the asset category. This is a sensitivity score of 2.
- **Low Sensitivity** It is possible the climate hazard will have a low or negligible impact on the asset category. This is a sensitivity score of 1.

Once the sensitivities have been identified the exposure analysis is undertaken. The exposure analysis involves determining the level of exposure of each climate hazard at the project location irrespective of the project type for example: flooding could be a risk if the project location is next to a river in a floodplain. Exposure is assigned a level of High, Medium or Low as per the below criteria.

- **High Exposure** It is almost certain or likely this climate hazard will occur at the project location i.e. might arise once to several times per year. This is an exposure score of 3.
- **Medium Exposure** It is possible this climate hazard will occur at the project location i.e. might arise a number of times in a decade. This is an exposure score of 2.
- **Low Exposure** It is unlikely or rare this climate hazard will occur at the project location i.e. might arise a number of times in a generation or in a lifetime. This is an exposure score of 1.

Once the sensitivity and exposure are categorised, a vulnerability analysis is conducted by multiplying the sensitivity and exposure to calculate the vulnerability.

8.4.4.1 Significance Criteria for CCRA

The CCRA involves an initial screening assessment to determine 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. The vulnerability assessment takes any proposed mitigation into account.

$$\text{Vulnerability} = \text{Sensitivity} \times \text{Exposure}$$

Table 8.4 details the vulnerability matrix; vulnerabilities are scored on a high, medium and low scale. A risk that is low or medium is classed as non-significant, while a high or extreme risk is classed as a significant risk.

TII guidance (TII, 2022a) and the EU technical guidance (European Commission, 2021a) note that if all vulnerabilities are ranked as low in a justified manner, no detailed climate risk assessment may be needed. The impact from climate change on the proposed development can be considered to be not significant.

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. An assessment of construction phase CCRA impacts is only required according to the TII guidance (TII, 2022a) if a detailed CCRA is required.

Table 8.4: Vulnerability Matrix

		Exposure		
		High (3)	Medium (2)	Low (1)
Sensitivity	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 screening CCRA, detailed in Section 8.8.2.2, did not identify any residual medium or high risks to the proposed development as a result of climate change. Therefore, a detailed CCRA for the construction and operational phase were scoped out.

While a CCRA for the construction phase was not required, best practice mitigation against climate hazards is still recommended in Section **Error! Reference source not found.**

8.5 DIFFICULTIES ENCOUNTERED

There were no difficulties encountered in compiling this assessment.

8.6 BASELINE ENVIRONMENT

PE-ENV-01104 (TII, 2022c) states that a baseline climate scenario should identify, consistent with the study area for the project, GHG emissions without the project for both the current and future baseline.

Ireland declared a climate and biodiversity emergency in May 2019 and in November 2019 there was European Parliament approval of a resolution declaring a climate and environment emergency in Europe. This, in addition to Ireland's current failure to meet its EU binding targets under Regulation 2018/842 (European Union, 2018) results in changes in GHG emissions either beneficial or adverse being of more significance than previously considered prior to these declarations.

8.6.1 CURRENT GHGA BASELINE

Data published in May 2024 (EPA, 2024) indicates that Ireland exceeded (without the use of flexibilities) its 2022 annual limit set under EU's Effort Sharing Decision (ESD) (EU 2018/842) by 3.54 Mt CO₂e. When the available flexibilities are taken into account, Ireland is in compliance with the 2022 ESR limit with an emissions surplus of 1.05 Mt CO₂e (EPA, 2024). The sectoral breakdown of 2023 GHG emissions is shown in Table 8.5. The sector with the highest emissions in 2023 was agriculture at 36% of the total, followed by transport at 19%. For 2023 total national emissions (excluding LULUCF) were 57.3 Mt CO₂e as shown in Table 8.5 (EPA, 2024).

Table 8.5: Total National GHG Emissions in 2023

Sector	2022 Emissions (Mt CO ₂ e)	2023 Emissions (Mt CO ₂ e)	% Total 2023 (including LULUCF)	% Change from 2022 to 2023
Agriculture	23.357	22.997	36%	-1.5%
Transport	11.751	11.782	19%	0.3%
Energy Industries	10.078	7.513	12%	-25.5%
Residential	5.787	5.793	9%	0.1%
Manufacturing Combustion	4.302	4.167	7%	-3.1%

Industrial Processes	2.288	2.179	3%	-4.8%
F-Gases	0.741	0.728	1%	-1.8%
Commercial Services	0.765	1.386	2%	-2.5%
Waste ^{Note 1}	0.878	0.849	1%	-3.3%
LULUFC	3.983	5.614	9%	40.9%
National total excluding LULUFC	60.605	57.394	91%	-5.3%
National total including LULUFC	64.588	63.008	100%	-2.4%

Note 1 Waste includes emissions from solid waste disposal on land, solid waste treatment (composting and anaerobic digestion), wastewater treatment, waste incineration and open burning of waste

8.6.2 FUTURE GHGA BASELINE

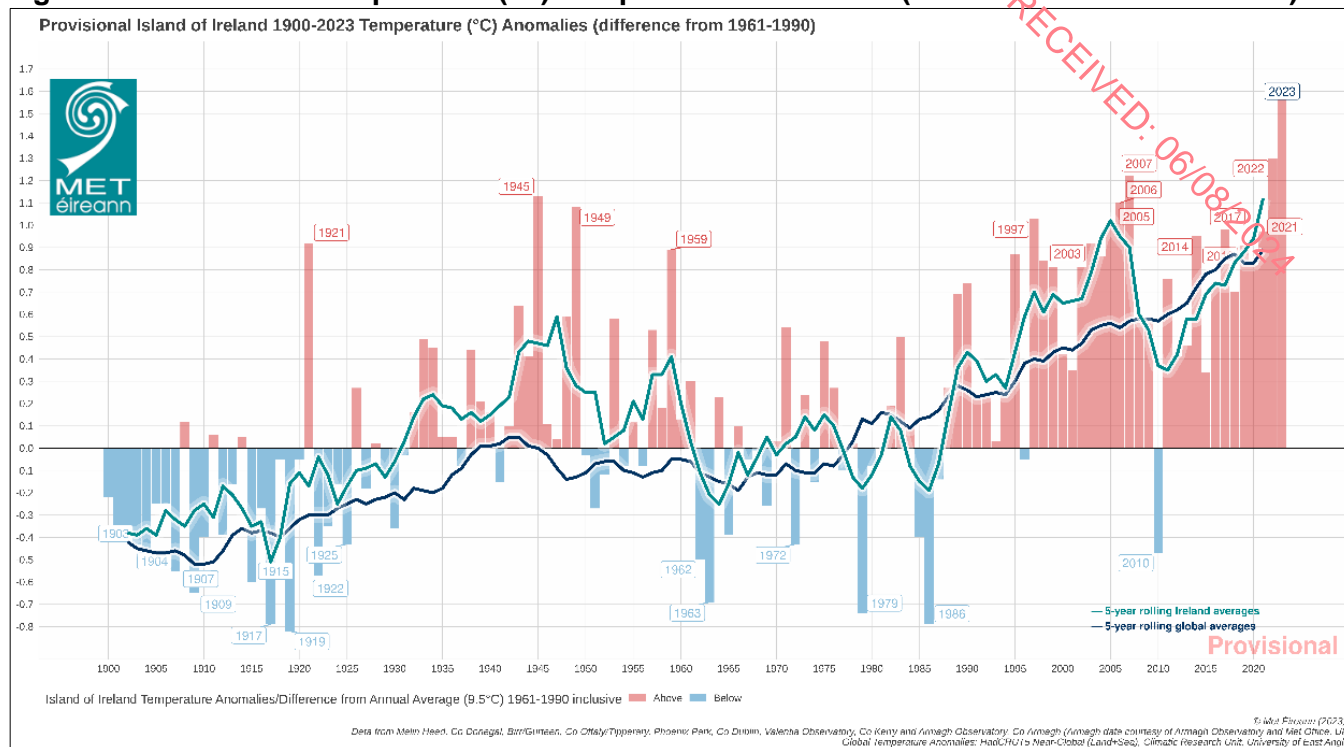
The future baseline with respect to the GHGA can be considered in relation to the future climate targets which the assessment results will be compared against. In line with TII (TII, 2022c) and IEMA Guidance (IEMA, 2022) the future baseline is a trajectory towards net zero by 2050, “*whether it [the project] contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050*”.

The future baseline will be determined by Ireland meeting its targets set out in the CAP24, and future CAPs, alongside binding 2030 EU targets. In order to meet the commitments under the Paris Agreement, the European Union (EU) enacted ‘*Regulation (EU) 2018/842 on binding annual GHG emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013*’ (hereafter referred to as the Regulation) (European Union, 2018). The Regulation aims to deliver, collectively by the EU in the most cost-effective manner possible, reductions in GHG emissions from the Emission Trading Scheme (ETS) and non-ETS sectors amounting to 43% and 30%, respectively, by 2030 compared to 2005. The Regulation was amended in April 2023 and Ireland must now limit its greenhouse gas 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.

8.6.3 CURRENT CCRA BASELINE

The region of the proposed development has a temperate, oceanic climate, resulting in mild winters and cool summers. The Met Éireann weather station at Dublin Airport is the nearest weather and climate monitoring station to the proposed development with meteorological data recorded for the 30-year period from 1991 to 2020 (Met Éireann, 2023a). The historical regional weather data for Dublin Airport Meteorological station is representative of the current climate in the region of the proposed development. The data for the 30-year period from 1991 to 2020 indicates that the wettest months at Dublin Airport Meteorological Station were November and December, and the driest month on average was June. July was the warmest month with a mean temperature of 15.4 Celsius. January was the coldest month with a mean temperature of 5.2 Celsius.

Met Éireann’s 2023 Climate Statement (Met Éireann, 2023a) states 2023’s average shaded air temperature in Ireland is provisionally 11.20 °C, which is 1.65°C above the 1961-1990 long-term average. Previous to this 2022 was the warmest year on record; however, 2023 was 0.38 °C warmer (see Figure 8.1).

Figure 8.1: 1900-2023 Temperature (°C) Temperature Anomalies (differences from 1961-1990)

The year 2023 also had above average rainfall, this included the warmest June on record and the wettest March and July on record. Record high sea surface temperatures (SST) were recorded since April 2023 which included a severe marine heatwave¹ to the west of Ireland during the June 2023. This marine heatwave contributed to the record rainfall in July.

Recent weather patterns and records of extreme weather events recorded by Met Éireann have been reviewed. Considering the extraordinary 2023 data, Met Éireann states that the latest Irish climate change projections indicate further warming in the future, including warmer winters. The record temperatures means the likelihood of extreme weather events occurring has increased. This will result in longer dry periods and heavy rainfall events. Storm surges and coastal flooding due to sea level rise. Compound events, where coastal surges and extreme rainfall events occur simultaneously will also increase. Met Éireann has high confidence in maximum rainfall rates increasing but not in how the frequency or intensity of storms will change with climate change.

8.6.4 FUTURE CCRA BASELINE

Impacts as a result of climate change will evolve with a changing future baseline, changes have the potential to include increases in global temperatures and increases in the number of rainfall days per year. Therefore, it is expected that the baseline climate will evolve over time and consideration is needed with respect to this within the design of the proposed development.

Ireland has seen 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 (EPA, 2021b). The EPA have compiled a list of potential adverse impacts as a result of climate change including the following which may be of relevance to the proposed development (EPA, 2021a):

- More intense storms and rainfall events;

¹ <https://www.met.ie/marine-heat-wave-2023-a-warning-for-the-future>

- Increased likelihood and magnitude of river and coastal flooding;
- Water shortages in summer in the east;
- Adverse impacts on water quality; and
- Changes in distribution of plant and animal species.

The EPA's *State of the Irish Environment Report (Chapter 2: Climate Change)* (EPA, 2020a) notes that projections show that full implementation of additional policies and measures, outlined in the 2019 Climate Action Plan, will result in a reduction in Ireland's total GHG emissions by up to 25% by 2030 compared with 2020 levels. Climate change is not only a future issue in Ireland, as a warming of approximately 0.8°C since 1900 has already occurred. The EPA state that it is critically important for the public sector to show leadership and decarbonise all public transport across bus and rail networks to the lowest carbon alternatives. The report (EPA, 2020a) underlines that the next decade needs to be one of major developments and advances in relation to Ireland's response to climate change in order to achieve these targets and that Ireland must accelerate the rate at which it implements GHG emission reductions. The report states that mid-century mean annual temperatures in Ireland are projected to increase by between 1.0°C and 1.6°C (subject to the emissions trajectory). In addition, heat events are expected to increase by mid-century (EPA, 2020a). While individual storms are predicted to have more severe winds, the average wind speed has the potential to decrease (EPA, 2020a).

TII's Guidance document PE-ENV-01104 (TII, 2022c) states that for future climate change a moderate to high Representative Concentration Pathways (RCP) should be adopted. RCP4.5 is considered moderate while RCP8.5 is considered high. Representative Concentration Pathways (RCPs) describe different 21st century pathways of GHG emissions depending on the level of climate mitigation action undertaken.

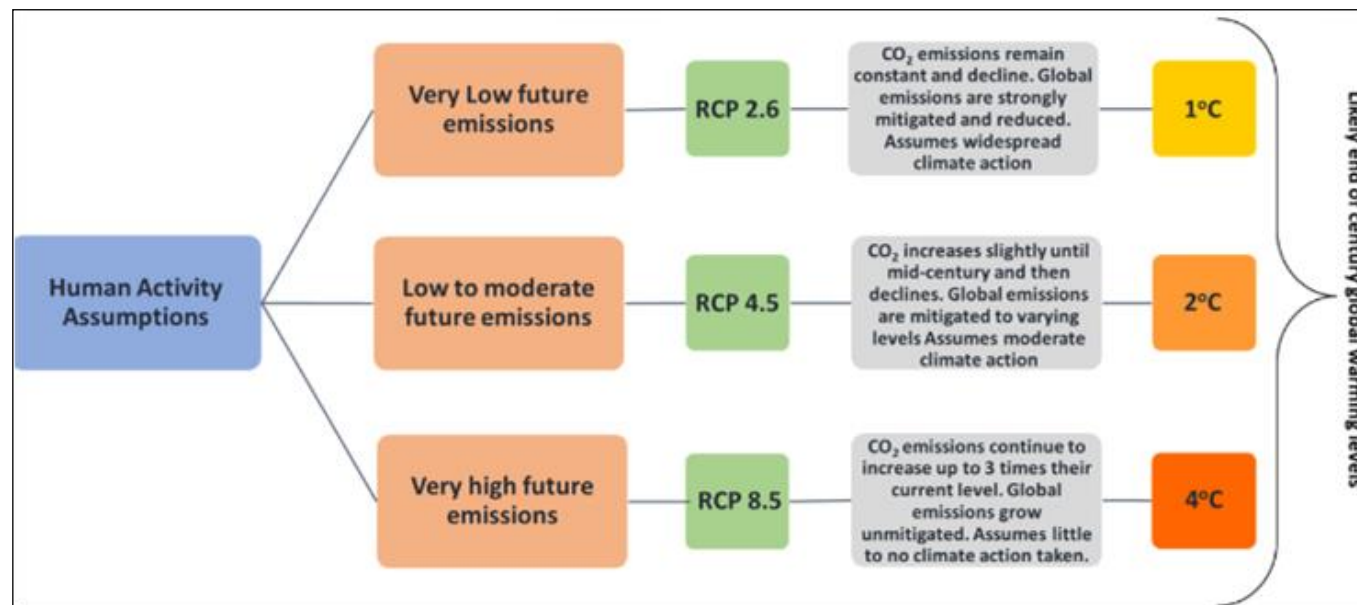
Future climate predictions undertaken by the EPA have been published in '*Research 339: High-resolution Climate Projections for Ireland – A Multi-model Ensemble Approach*' (EPA, 2020b). The future climate was simulated under both Representative Concentration Pathway 4.5 (RCP4.5) (medium-low) and RCP8.5 (high) scenarios. This study indicates that by the middle of this century (2041–2060), mid-century mean annual temperatures are projected to increase by 1 to 1.2°C and 1.3 to 1.6°C for the RCP4.5 and RCP8.5 scenarios, respectively, with the largest increases in the east. Warming will be enhanced at the extremes (i.e. hot days and cold nights), with summer daytime and winter night-time temperatures projected to increase by 1 to 2.4°C. There is a projected substantial decrease of approximately 50%, for the number of frost and ice days. Summer heatwave events are expected to occur more frequently, with the largest increases in the south. In addition, precipitation is expected to become more variable, with substantial projected increases in the occurrence of both dry periods and heavy precipitation events. Climate change also has the potential to impact future energy supply which will rely on renewables such as wind and hydroelectric power. Wind turbines need a specific range of wind speeds to operate within and droughts or low ground water levels may impact hydroelectric energy generating sites. More frequent storms have the potential to damage the communication networks requiring additional investment to create resilience within the network.

The EPA's *Critical Infrastructure Vulnerability to Climate Change* report (EPA, 2021b) assesses the future performance of Ireland's critical infrastructure when climate is considered. With respect to road infrastructure, fluvial flooding and coastal inundation/coastal flooding are considered the key climate change risks with snowstorm and landslides being medium risks. Extreme winds and heatwaves/droughts are considered low risk to road infrastructure. One of the key outputs of the research was a framework that will provide quantitative risk-based decision support for climate change impacts and climate change adaptation analysis for infrastructure.

National Framework for Climate Services (NFCS) was founded in June 2022 to streamline the provision of climate services in Ireland and will be led by Met Éireann. The aim of the NFCS is to enable the co-production, delivery and use of accurate, actionable and accessible climate information and tools to support climate resilience planning and decision making. In addition to the NFCS, further work has been ongoing into climate projects in Ireland through research under the TRANSLATE project. TRANSLATE

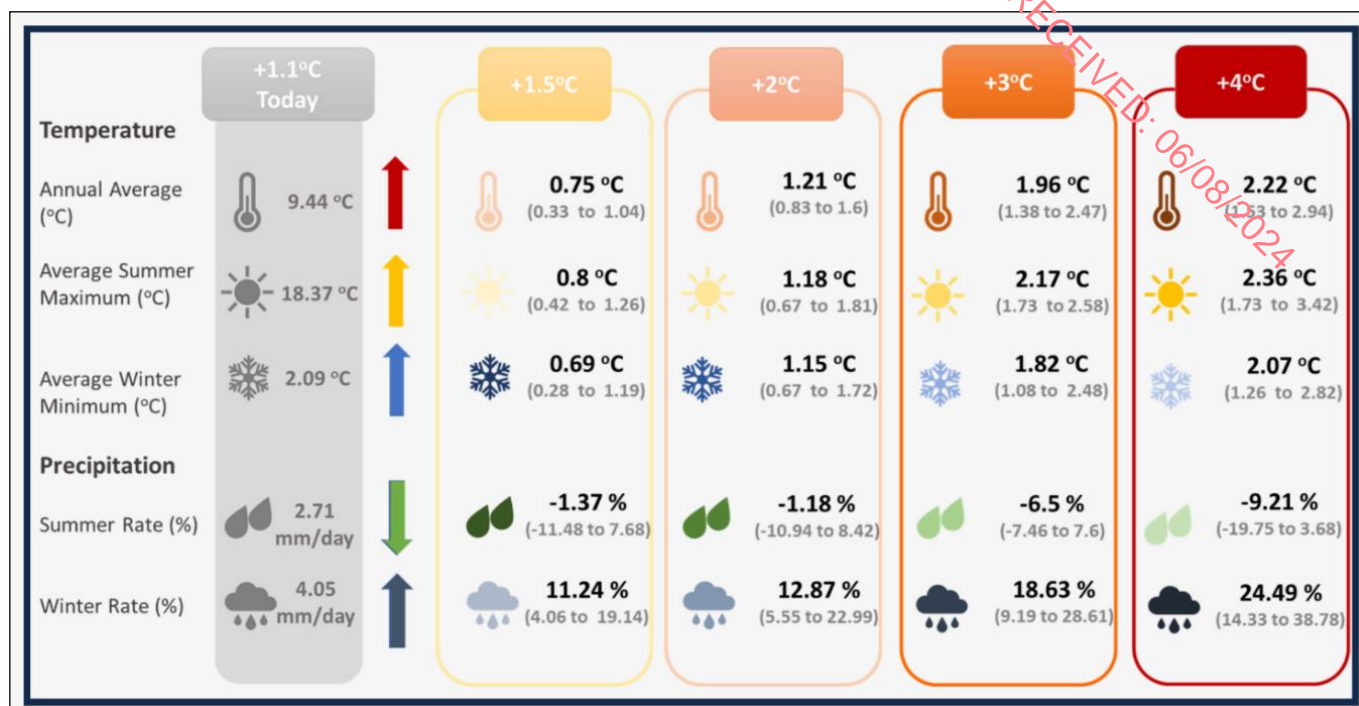
(Met Éireann, 2023b) has been led by climate researchers from University of Galway – Irish Centre for High End Computing (ICHEC), and University College Cork – SFI Research Centre for Energy, Climate and Marine (MaREI), supported by Met Éireann climatologists. TRANSLATE's outputs are produced using a selection of internationally reviewed and accepted models from both CORDEX and CMIP5. Representative Concentration Pathways (RCPs) provide a broad range of possible futures based on assumptions of human activity. The modelled scenarios include for “least” (RCP2.6), “more” (RCP4.5) or “most” (RCP8.5) climate change, see Figure 8.2.

Figure 8.2: Representative Concentration Pathways Associated Emission Levels



Source TRANSLATE Project Story Map (Met Éireann, 2023b)

TRANSLATE (Met Éireann, 2023b) provides the first standardised and bias-corrected national climate projections for Ireland to aid climate risk decision making across multiple sectors (for example, transport, energy, water), by providing information on how Ireland's climate could change as global temperatures increase to 1.5°C, 2°C, 2.5°C, 3°C or 4°C (see Figure 8.2). Projections broadly agree with previous projections for Ireland. Ireland's climate is dominated by the Atlantic Meridional Overturning Circulation (AMOC), a large system of ocean currents – including the Gulf Stream – characterised by a northward flow of warm water and a southward flow of cold water. Due to the AMOC, Ireland does not suffer from the extremes of temperature experienced by other countries at a similar latitude. Recent studies have projected that the AMOC could decline by 30% – 40 % by 2100, resulting in cooler North Atlantic Sea surface temperatures (SST)s (Met Éireann, 2023b). Met Éireann projects that Ireland will nevertheless continue to warm, although the AMOC cooling influence may lead to reduced warming compared with continental Europe. AMOC weakening is also expected to lead to additional sea level rise around Ireland. With climate change Ireland's temperature and rainfall will undergo more and more significant changes e.g. on average summer temperature could increase by more than 2°C, summer rainfall could decrease by 9% while winter rainfall could increase by 24%. Future projects also include a 10-fold increase in the frequency of summer nights (values > 15°C) by the end of the century, a decrease in the frequency of cold winter nights and an increase in the number of heatwaves. A heatwave in Ireland is defined as a period of 5 consecutive days where the daily maximum temperature is greater than 25°C.

Figure 8.3: Change of Climate Variables for Ireland for Different Global Warming Thresholds

Source TRANSLATE Project Story Map (Met Éireann, 2023b)

8.7 THE 'DO NOTHING' SCENARIO

Under the Do-Nothing scenario, construction works associated with the proposed development will not take place. Impacts from increased traffic volumes and associated emissions from the proposed development will also not occur. The climate baseline will continue to develop in line with the identified trends (see Section 8.6).

8.8 POTENTIAL SIGNIFICANT EFFECTS

8.8.1 GREENHOUSE GAS ASSESSMENT

8.8.1.1 Construction Phase

Embodied carbon is carbon dioxide emitted during the manufacture, transport and construction of building materials, together with site activities. The most significant proportion of carbon emissions tend to occur during the construction phase because of embodied carbon in construction materials and emissions from construction activities. Therefore, the assessment has included the construction phase embodied carbon for the purposes of the EIAR. The assessment is broken down into the following stages as per Section 8.4.3.1:

- Product stage (A1 – A3);
- Transportation to site (A4);
- Site operations (construction activities) (A5); and
- Material replacement & refurbishment (B4 – B5).

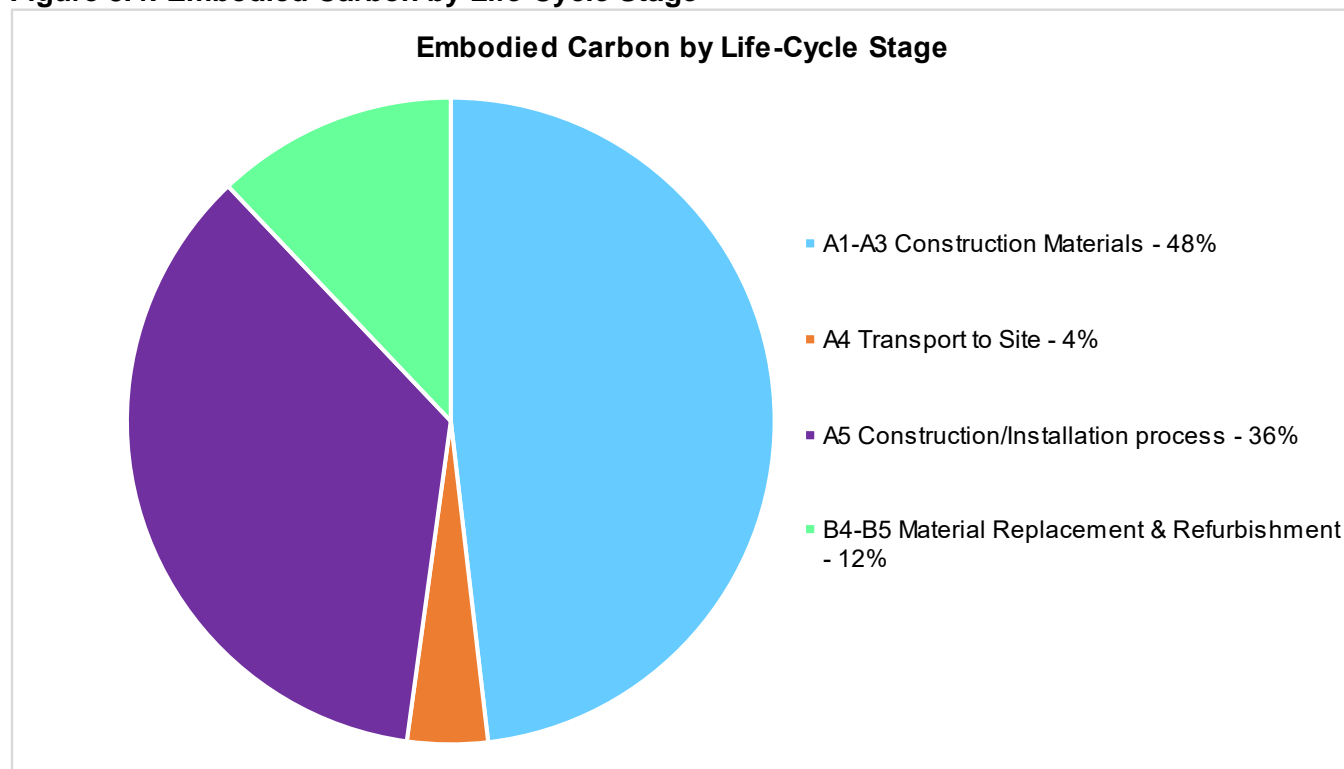
The construction phase embodied carbon emissions comprise stages A1 – A5 include the construction materials, the transport of the materials to site and the construction activities or site operations. Ongoing material refurbishment and replacement throughout the lifetime of the development is included within category B4 – B5, these are default values based on the typical maintenance requirements for the chosen

material types over the assumed 50-year lifetime. Figure 8.4 shows the embodied carbon for the proposed development per life-cycle stage with both the output from the OneClick tool and TII Carbon Tool assessments included.

Construction materials make up the majority of carbon emissions for the proposed development making up approx. 48% of the total construction phase embodied carbon emissions across the different buildings and the relevant infrastructure. The external walls as well as the beams, floors and roofs are the areas with the highest carbon impact, based on the general default values and assumptions made for the carbon calculations. Transportation to site, site operations and material replacement make up the remainder of the construction embodied carbon emissions.

The carbon assessment has highlighted the areas where the highest embodied carbon emissions occur, specifically as a result of building materials. The carbon emissions have been calculated based on standard default materials for the various building types within the OneClick tool as detailed material information was not available at this stage in the project. Additionally, the average material types within the TII Carbon Tool were used for the purposes of this assessment in the absence of more detailed information.

Figure 8.4: Embodied Carbon by Life-Cycle Stage



It has been calculated that the total construction phase embodied carbon (including maintenance and replacement of materials over the development lifetime) will be 16,907 tonnes CO₂e (see Table 8.6). The GHG emissions from the development as a total cannot be compared against one specific sector 2030 carbon budget, the emissions are broken down into different assessment categories and these must be compared separately to the relevant sectoral emissions budget which are detailed in Table 8.7. The relevant sectoral emissions for the proposed development comparison include the Industry Buildings (Residential) sector, Transport sector, Electricity sector and Waste sector. The predicted emissions for the proposed development are annualised over the assumed 50-year lifespan and then compared to the relevant sector 2030 carbon budgets. Annualising the full carbon emissions over the lifetime of the development allows for appropriate comparison with annual GHG targets.

Table 8.6: GHG Assessment Results

Stage	GHG Assessment Category	Predicted GHG Emissions (tCO ₂ e)	Relevant Sector for Carbon Budget Comparison	Annualised GHG Emissions as % of Relevant Carbon Budget
A1-A3	Materials	8,153	Industry	0.004%
A4	Material Transport	680	Transport	0.0002%
A5	Clearance and demolition	3.1	Industry	0.000002%
A5	Excavation	21	Industry	0.00001%
A5	Plant Use	5,762	Electricity	0.004%
A5	Construction Worker Travel to Site	236	Transport	0.00008%
A5	Construction Waste Disposal	6	Waste	0.00001%
A5	Construction Waste Transport	3	Transport	0.000001%
B4-B5	Maintenance Material	2,043	Industry	0.001%
Total		16,907		

Note 1 Project lifespan assumed 50 years for calculation purposes in line with best practice

The predicted GHG emissions (as shown in Table 8.7) can be averaged over the full lifespan of the proposed development to give the predicted annual emissions to allow for direct comparison with national annual emissions and targets.

In Table 8.7, GHG emissions have been compared against the carbon budget for the electricity, transport, industry and waste sectors in 2030 (DECC, 2023a), against Ireland's total GHG emissions in 2022 and against Ireland's EU 2030 target of a 30% reduction in non-ETS sector emissions based on 2005 levels (33 Mt CO₂e) (set out in Regulation EU 2018/842 of the European Parliament and of the Council).

The estimated total GHG emissions, when annualised over the 50-year proposed development lifespan, are equivalent to 0.0006% of Ireland's total GHG emissions in 2022 and 0.001% of Ireland's non-ETS 2030 emissions target. The estimated GHG emissions associated with energy use during the construction phase are equivalent to 0.004% of the 2030 Electricity budget, while the total GHG emissions associated with transport-related activities are 0.0003% of the 2030 Transport budget, construction waste GHG emissions are 0.00001% of the Waste budget and industry-related activities are 0.01% of the 2030 Industry budget (DECC, 2023a).

Table 8.7: Estimated GHG Emissions Relative to Sectoral Budgets and GHG Baseline

Target/Sectoral Budget (tCO ₂ e)		Sector Annualised Proposed Development GHG Emissions	Annualised Proposed Development GHG Emissions as % of Relevant Target/Budget
Ireland's 2022 Total GHG Emissions (existing baseline)	60,605,000	Total GHG Emissions	0.0006%
Non-ETS 2030 Target	33,000,000	Total GHG Emissions	0.001%
2030 Sectoral Budget (Electricity Sector)	3,000,000	Total Electricity Emissions	0.004%
2030 Sectoral Budget (Transport Sector)	6,000,000	Total Transport Emissions	0.0003%
2030 Sectoral Budget (Waste Sector)	1,000,000	Total Waste Emissions	0.00001%
2030 Sectoral Budget (Industry Sector)	4,000,000	Total Industry Emissions	0.01%

8.8.1.2 Operational Phase

Ongoing maintenance of the proposed development materials has been accounted for within Section 8.8.1.1 above. The following section outlines the impact of operational energy use on GHG emissions.

The proposed development has been designed to reduce the impact 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 Energy Statement prepared by ENX Consulting Engineers, in relation to the development. The primary elements with respect to reducing climate impacts and optimising energy usage are summarised in Section **Error! Reference source not found.**

8.8.1.3 GHGA Significance of Effects

The TII guidance 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 8.9 has been taken into account when determining the significance of the proposed development's GHG emissions. According to the TII significance criteria described in Section 0 and Table 8.3 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.

8.8.2 CLIMATE CHANGE RISK ASSESSMENT

8.8.2.1 Construction Phase

A detailed CCRA of the construction phase has been scoped out, as discussed in Section 8.4.4 and Section 8.8.2.2, which state that there are no residual medium or high risk vulnerabilities to climate change hazards and a detailed CCRA is not required (TII, 2022a). 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 8.9:

- Flood risk due to increased precipitation, and intense periods of rainfall. This includes fluvial and pluvial flooding. The Flood Risk Assessment (FRA) carried out for the proposed development by Paul McGrail Consulting Engineers concluded that the site is considered to be within Flood Zone C which indicates that coastal, fluvial or pluvial flooding is not a significant risk at the project location. However, best practice mitigation measures are to be implemented as per Section 8.9;
- Increased temperatures potentially causing drought, wildfires and prolonged periods of hot weather;
- Reduced temperatures resulting in ice or snow; and
- Major storm damage – including wind damage.

8.8.2.2 Operational Phase

In order to determine the vulnerability of the proposed development to climate change the sensitivity and exposure of the development to various climate hazards must first be determined. The following climate hazards have been considered in the context of the proposed development: flooding (coastal, pluvial, fluvial), extreme heat, extreme cold, wildfire, drought, extreme wind, lightning, hail, landslides and fog.

The sensitivity of the proposed development to the above climate hazards is assessed irrespective of the project location. Table 8.8 details the sensitivity of the proposed development on a scale of high (3), medium (2) and low (1). Once the sensitivity has been established the exposure of the proposed

development to each of the climate hazards is determined, this is the likelihood of the climate hazard occurring at the project location and is also scored on a scale of high (3), medium (2) and low (1). The product of the sensitivity and exposure is then used to determine the overall vulnerability of the proposed development to each of the climate hazards as per Table 8.4. The results of the vulnerability assessment are detailed in Table 8.8.

Table 8.8: Climate Change Vulnerability Assessment

Climate Hazard	Sensitivity	Exposure	Vulnerability
Flooding (Coastal, Pluvial, Fluvial)	1 (Low)	1 (Low)	1 (Low)
Extreme Heat	1 (Low)	2 (Medium)	2 (Low)
Extreme Cold	1 (Low)	2 (Medium)	2 (Low)
Wildfire	1 (Low)	1 (Low)	1 (Low)
Drought	1 (Low)	1 (Low)	1 (Low)
Extreme Wind	1 (Low)	1 (Low)	1 (Low)
Lightning & Hail	1 (Low)	1 (Low)	1 (Low)
Landslides	1 (Low)	1 (Low)	1 (Low)
Fog	1 (Low)	1 (Low)	1 (Low)

The sensitivity and exposure of the area was determined with reference to a number of online tools and with input from the various discipline specialists on the project team. It was concluded that proposed development does not have any significant vulnerabilities to the identified climate hazards as described in the below sections. All vulnerabilities are classified as low. There are no residual medium or high-risk vulnerabilities to climate change hazards and a detailed CCRA is not required (TII, 2022a).

Flooding

A Site-Specific Flood Risk Assessment (FRA) for the proposed development was undertaken by Paul McGrail Consulting Engineers and is submitted with this planning application. The FRA concluded that the site is considered to be within Flood Zone C which indicates that coastal, fluvial or pluvial flooding is not a risk at the project location. The drainage for the development has been designed to allow for a 20% increase in rainfall in future years as a result of climate change, this is in line with the “Medium Risk” RCP4.5 scenario. Therefore, the sensitivity to pluvial flooding has been categorised as 2 (Medium) as the design only mitigates the medium risk future scenario; allowing an additional 30% for future climate change related rainfall in the drainage calculations would align with the “High Risk” RCP8.5 scenario. Finished Floor Levels (FFL) will be set above the road levels and surrounding garden levels to ensure any seepage of groundwater onto the development does not flood into the properties. The Minimum Finished Floor Level is 34m O.D. which is approx. 8m above the 0.1% AEP Event. This risk can be mitigated to an acceptable degree by the implementation of appropriate active flood defence measures. Therefore, the risk of flooding at the proposed development overall is still considered low.

Extreme Wind, Fog, Lightning and Hail

In relation to extreme winds, the buildings shall be designed to the appropriate standards to account for the relevant wind loadings. If required as part of the building design, lightning protection shall be provided for. Hail and fog are not predicted to significantly affect the buildings due to their design.

Wildfire

In relation to wildfires, the *Think Hazard!* tool developed by the Global Facility for Disaster Reduction and Recovery (GFDRR, 2023), indicates that the wildfire hazard is classified as medium for the Fingal County area. This means that there is between a 10% to 50% chance of experiencing weather that could support a hazardous wildfire that may pose some risk of life and property loss in any given year. Future climate modelling indicates that there could be an increase in the weather conditions which are favourable to fire conditions, these include increases in temperature and prolonged dry periods. However, due to the project

location in a suburban area the risk of wildfire is significantly lessened, and it can be concluded that the proposed development is of low vulnerability to wildfires.

Landslide

The GSI landslide susceptibility mapping database (GSI, 2023) was reviewed in order to determine the risk from landslides at the proposed development. There have not been any historical landslide events in the vicinity of the proposed development and the area has a low susceptibility to future landslides. Therefore, landslides are not a risk for the proposed development site.

Extreme Temperatures (Heat & Cold) & Drought

In relation to extreme temperatures, both extreme heat and extreme cold, these have the potential to impact the building materials and some related infrastructure. However, the building materials selected at the detailed design stage will be of high quality and durability. Therefore, extreme temperatures are not considered a significant risk.

In relation to drought, planting material for the proposed development landscaping is typical of the locality and is generally tolerant of climatic zones which experience variable warmer and cooler conditions. Therefore, the sensitivity to drought is considered low and the vulnerability is also low.

Summary

Overall, the proposed development has at most low vulnerabilities to the identified climate hazards. Therefore, no detailed risk assessment is required.

8.8.2.3 CCRA Significance of Effects

With design mitigation in place, there are no significant risks to the proposed development as a result of climate change. In accordance with the EPA Guidelines (EPA, 2022), the significance of effect of the impacts to the proposed development as a result of climate change are **direct, long-term, negative** and **imperceptible**, which is overall **not significant** in EIA terms.

8.8.3 CUMULATIVE EFFECTS

With respect to the requirement for a cumulative assessment PE-ENV-01104 (TII, 2022c) states that “*for GHG Assessment is the global climate and impacts on the receptor from a project are not geographically constrained, the normal approach for cumulative assessment in EIA is not considered applicable.*”

However, by presenting the GHG impact of a project in the context of its alignment to Ireland’s trajectory of net zero and any sectoral carbon budgets, this assessment will demonstrate the potential for the project to affect Ireland’s ability to meet its national carbon reduction target. Therefore, the assessment approach is considered to be inherently cumulative. The cumulative impact of the proposed development in relation to GHG emissions is considered **direct, long-term, negative** and **slight**, which is overall **not significant** in EIA terms.

8.9 MITIGATION

8.9.1 CONSTRUCTION PHASE MITIGATION

Embodied carbon of materials and construction activities will be the primary source of climate impacts during the construction phase. During the construction phase the following best practice measures shall be implemented on site to prevent significant GHG emissions and reduce impacts to climate:

- Materials will be reused on site where possible;

- Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods;
- Ensure all plant and machinery are well maintained and inspected regularly;
- Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site;
- Material choices and quantities will be reviewed during detailed design, to identify and implement lower embodied carbon options where feasible;
- Sourcing materials locally where possible to reduce transport related CO₂ emissions; and
- The project shall review and determine compliance with the requirements set out in the EU Taxonomy Regulation (Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment and amending Regulation (EU) 2019/2088 (Text with EEA relevance) in relation to circular economy. This is specific to reuse, recycling and material recovery of demolition and construction wastes.

These measures are supported by Glenveagh Properties PLC's *Net Zero Transition Plan 2023*, published in March 2023, which identifies the sources of Glenveagh Properties PLC's emissions and proposes measures to reduce these. A commitment to achieve a 55% reduction in Scope 3 (construction methods) emissions intensity (tCO₂e per 100 m² of complete floor area) by 2031 (using 2021 as the baseline year) will involve supplier engagement to make informed procurement decisions, engaging with subcontractors to support their transition to less carbon intensive fuels (diesel and gas oil is currently the norm) and investing in innovation of designing and building homes to reduce their associated embodied carbon. A reduction target of 46.2% by 2031 is also set in the plan for Scope 1 and 2 emissions (company operations). All targets have been validated by the Science Based Targets initiative (SBTi).

The Science Based Targets initiative (SBTi) is a corporate climate action organisation, incorporated as a charity, which develops standards, tools and guidance enabling companies to set greenhouse gas (GHG) emissions reductions targets in line net-zero by 2050 at latest. Science-based targets show companies and financial institutions how much and how quickly they need to reduce their greenhouse gas (GHG) emissions to prevent the worst effects of climate change (SBTi, 2024a). Glenveagh Properties PLC was one of the over 4,000 companies and financial institutions who had their emission reduction targets validated by the SBTi (Marshall Yards Development Company Limited which is a subsidiary of Glenveagh's target's can be searched in the SBTi's target dashboard (SBTi, 2024b)).

Glenveagh Properties PLC's *Full Year 2023 Results*, published in February 2024, identified that Scope 3 emissions decreased by 7% against the 2021 baseline, measured on an intensity basis (tCO₂e per 100m²). This is primarily due to the focus on the energy efficiency of the residential unit, with the proportion of A1 rated homes in 2023 increasing from 55% to 85%. Scope 1 and 2 emissions decreased by 11% compared to 2022, which can be attributed to the roll out of HVO (hydrotreated vegetable oil) to replace diesel across sites.

Specific measures are proposed to reduce GHG emissions during the construction phase:

- An estimated that approximately 25,939m³ of material will be excavated during the construction phase of the development site. 12,740m³ of this material can be reused, which represents greenhouse gas (GHG) savings of 24.6 tonnes if the avoidance of worst-case landfill disposal is assumed;
- Materials such as concrete, bricks, tiles and ceramics, metals and timber may be diverted from waste processing by recycling or disposal in landfill and can instead be reused on-site. This will reduce the associated CO₂ by approximately 0.5 tonnes; and
- Use of timber as a lower carbon option for frames for the house units.

In terms of impact on the proposed development due to climate change, during construction the Contractor will be required to mitigate against the effects of extreme rainfall/flooding through site risk assessments and method statements. The Contractor will also be required to mitigate against the effects of extreme

wind/storms, temperature extremes through site risk assessments and method statements. All materials used during construction will be accompanied by certified datasheets which will set out the limiting operating temperatures. Temperatures can affect the performance of some materials, and this will require consideration during construction. During construction, the Contractor will be required to mitigate against the effects of fog, lighting and hail through site risk assessments and method statements.

8.9.2 OPERATIONAL PHASE MITIGATION

As per the Climate Action Energy Statement prepared by ENX Consulting Engineers (submitted under separate cover with this planning application) the development will be a Nearly Zero Energy Building (NZEB) in accordance with the Building Regulations Technical Guidance Document L 2021 and the relevant sustainability policies within the Fingal Development Plan 2023-2028. The report details a number of measures that have been incorporated into the design of the development to reduce the impact on climate wherever possible. Such measures included in the proposed development to reduce the impact to climate from energy usage are:

- The residential units will aim to achieve a Building Energy Ratio (BER) of A2 (25-50 kwh/m²/yr with CO₂ emissions <10 kg CO₂/m² per year).;
- Achieve air tightness standards of 3 m³/m²/hr;
- Ensure thermal bridging details are designed to achieve default thermal bridging factors of 0.15W/m²K (0.15 W/m²k required in Part L);
- Energy Performance Coefficient (EPC) < 0.30;
- Carbon Performance Coefficient (CPC) < 0.35;
- Renewable Energy Ratio (RER) > 0.20;
- Meet or exceed minimum U-Value standards identified in Part L 2022 Dwellings;
- Various options for heating of apartments are to be considered, including air to water heat pumps and exhaust air heat pumps and implemented to achieve A2 BER Rating;
- Provide an appropriate combination of technologies to ensure energy consumption is in line with Part L 2022 Dwellings requirements;
- All lighting to be energy efficient with provision made for low energy lamps such as Compact Fluorescent Lamps (CFLs) which use 80% less electricity and last up to 10 times longer than ordinary light bulbs in the dwellings;
- Use of natural daylight will be maximised to reduce the need for artificial lighting;
- Passive solar gains will be optimised to reduce space heating demands during the winter months, whilst limiting summertime solar gains to reduce space cooling demands;
- Natural/passive ventilation in circulation areas, car parks and other common areas removes need for mechanical ventilation;
- Bicycle parking spaces will be provided and the connectivity of onsite pedestrian and cycle infrastructure has been incorporated into the design of the proposed development; and
- The proposed development location maximises connectivity to existing and proposed public transport bus services, as well as by its proximity to the green Luas line, providing sustainable alternative to private vehicles.

The above measures will assist in optimising the energy consumed by the development and will also have the benefit of reducing the impact to climate during the operational phase of the development.

Some measures have been incorporated into the design of the development to mitigate the impacts of future climate change. For example, adequate attenuation and drainage have been incorporated to avoid potential flooding impacts due to increased rainfall events in future years. These measures have been considered when assessing the vulnerability of the proposed development to climate.

8.10 RESIDUAL IMPACT ASSESSMENT

The proposed development will result in some impacts to climate through the release of GHGs. TII state that the crux of assessing significance is “*not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050*”. The proposed development has proposed some best practice mitigation measures and is committing to reducing climate impacts where feasible. As per the assessment criteria in Table 8.3 the impact of the proposed development in relation to GHG emissions is considered direct, **long-term, negative** and **slight**, which is overall **not significant** in EIA terms.

In relation to climate change vulnerability, it has been assessed that there are no significant risks to the proposed development as a result of climate change. The residual effect of climate change on the proposed development is considered **direct, long-term, negative** and **imperceptible**, which is overall **not significant** in EIA terms.

8.11 RISK OF MAJOR ACCIDENTS OR DISASTERS

As detailed in Section 8.8.2.1, climate change has the potential to alter weather patterns and increase the frequency of rainfall in future years. However, the potential for flooding on site has been reviewed and adequate attenuation and drainage have been provided for to account for increased rainfall in future years. The proposed development has been assessed as having only low vulnerabilities to various climate change related hazards and there is no significant risk to the site as a result of climate change. Therefore, the impact will be **neutral** and **imperceptible**.

8.12 WORST CASE SCENARIO

Worst case estimates have been used as part of this assessment. As a result, Section 8.10 details the worst-case impact for the proposed development.

8.13 INTERACTIONS

8.13.1 LAND, SOILS, GEOLOGY AND HYDROLOGY

The impact of flood risk has been assessed and the surface water drainage network will be designed to cater for increased rainfall in future years as a result of climate change. The effect of the interactions between climate and land and soils (see Ch. 5 Land and Soils) and water (Ch. 6 Water) are **direct, short-term, negative** and **imperceptible** during the construction phase and **direct, long-term, negative** and **imperceptible** during the operational phase, which is overall **not significant** in EIA terms.

8.13.2 AIR QUALITY

Air quality (Ch. 7 Air Quality) and climate have interactions due to the emissions from the burning of fossil fuels during the construction and operational phases generating both air quality and climate impacts. Air quality modelling outputs are utilised within the climate chapter (see Ch. 8 Climate). There is no impact on climate due to air quality; however, the sources of impacts on air quality and climate are strongly linked.

8.13.3 TRAFFIC AND TRANSPORTATION

During the construction and operational phase, there is the potential for interactions between climate and traffic (for more information see Ch. 11 Material Assets – Traffic). Vehicles accessing the site will result in emissions of CO₂, a greenhouse gas. However, the effects of the interactions between traffic and climate are considered to be **direct, short-term, negative** and **not significant** during the construction phase and **direct, long-term, negative** and **not significant** during the operational phase.

8.13.4 WASTE

Waste management measures will be put in place to minimise the amount of waste entering landfill, which has higher associated embodied carbon emissions than other waste management such as recycling (see Ch. 11 Material Assets - Waste). The effect of the interactions between waste and climate are considered to be **direct, short-term, negative** and **not significant** during the construction phase and **direct, long-term, negative** and **not significant** during the operational phase.

8.14 MONITORING

There is no proposed monitoring during the construction phase or during the operational phase.

8.15 REFERENCES AND SOURCES

Standard Method of Measurement (CESSM) (2013) Carbon and Price Book database
 Department of Environment, Climate and Communications (DECC) (2023a) Climate Action Plan (CAP) 2024
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 European Commission (2014) 2030 Climate and Energy Policy Framework
 European Commission (2017) Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report
 European Commission (2021a) Technical guidance on the climate proofing of infrastructure in the period 2021-2027
 European Commission (2021b) 2030 EU Climate Target Plan
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The Greenhouse Gas Protocol (2004) A Corporate Accounting and Reporting Standard, Revised Edition
Highways England (2021) UK Design Manual for Roads and Bridges (DMRB) Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 14 LA 114 Climate
Institute of Environmental Management & Assessment (IEMA) (2020a) EIA Guide to: Climate Change Resilience and Adaptation
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Transport Infrastructure Ireland (TII) (2022a) PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document
Transport Infrastructure Ireland (TII) (2022b) PE-ENV-01105: Climate Assessment Standard for Proposed National Roads
Transport Infrastructure Ireland (TII) (2022c) GE-ENV-01106: TII Carbon Assessment Tool for Road and Light Rail Projects and User Guidance Document
Transport Infrastructure Ireland (TII) (2022d) TII Roads Emissions Model (REM) and Model Development Report (GE-ENV-01107)

9.0 NOISE AND VIBRATION

9.1 INTRODUCTION

This EIA Chapter has been prepared by AWN Consulting Ltd. (AWN) to assess the potential noise and vibration effects of the proposed Large Scale Residential Development (LRD) in Balbriggan, Co. Dublin. The following assessment is carried out in the context of current standards and guidance as detailed in relevant sections below.

This chapter includes a description of the receiving ambient noise climate in the vicinity of the subject site and an assessment of the potential noise and vibration impacts associated with the proposed development, during both the short-term construction phase and the long-term operational phase, on its surrounding environment. The assessment of direct, indirect and cumulative noise and vibration effects on the surrounding environment have been considered in this chapter.

The construction phase will involve site clearing and excavations, piling of foundations, services installations, construction of building frame and envelope landscaping and construction of internal roads. This phase will generate the highest potential noise impact due to the works involved, however, the phase is short-term in duration.

The primary potential source of outward noise in the operational context are long-term and will comprise traffic movements to site using the existing road network, which is assessed for potential environmental noise impact within the relevant section of this Chapter.

Mitigation and monitoring measures are included, where relevant, to ensure the proposed development is constructed and operated in an environmentally sustainable manner in order to ensure minimal impact on the receiving environment.

This chapter has been prepared by Alistair Maclaurin. Alistair holds a BSc in Creative Music and Sound Technology and a Diploma in Acoustics and Noise Control. He is a member of the Institute of Acoustics (MIOA). Alistair has worked in the field of acoustics since 2012. He has been the lead noise consultant across various sites on major infrastructure projects such as Crossrail and Thames Tideway Tunnel, specialising in construction noise assessment and control. Additionally, he has undertaken various environmental noise assessments and planning reports for infrastructure, residential, commercial and other developments.

9.2 METHODOLOGY

The assessment of effects 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 report. In addition to specific guidance documents for the assessment of noise and vibration effects, which are discussed further in the relevant sections, the following guidelines were considered and consulted for the purposes of this chapter:

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 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 (EPA, 2022).
- BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise.
- BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2 – Vibration.

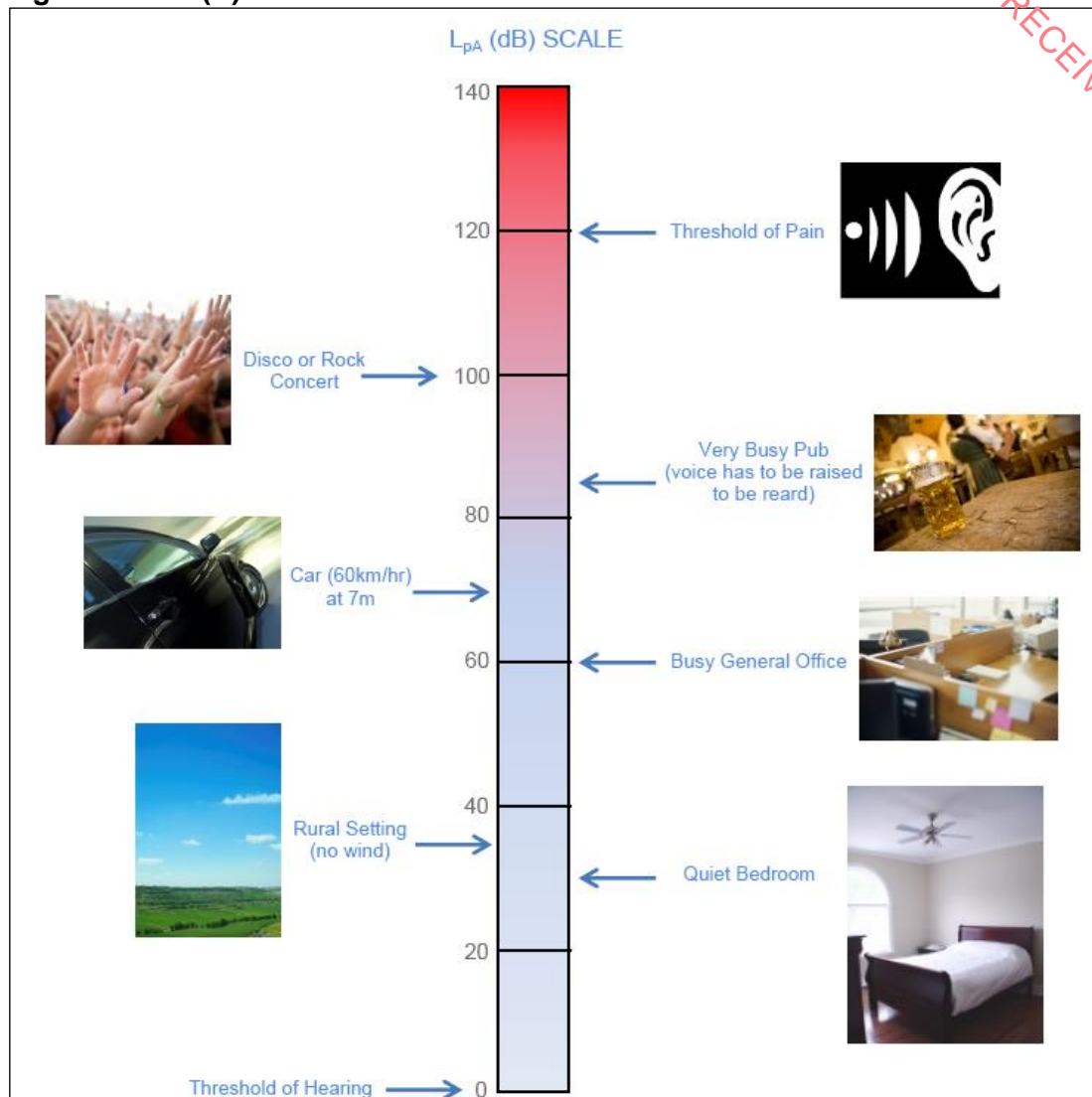
- BS 6472-1: 2008 Guide to evaluation of human exposure to vibration in buildings, Part 1 Vibration sources other than blasting (hereafter referred to as BS 6472–1) (BSI 2008);
- BS 7385-2:1993 Evaluation and measurement for vibration in buildings. Guide to damage levels from groundborne vibration;
- ISO 1996-1:2016 Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment procedures (hereafter referred to as ISO 1996 – 1) (ISO 2016);
- ISO 1996-2:2017 - Description, measurement and assessment of environmental noise. Part 2: Determination of sound pressure levels (hereafter referred to as ISO 1996 – 2) (ISO 2017);
- British Standard BS 4142: 2014+A1:2019: Methods for Rating and Assessing Industrial and Commercial Sound.
- UK Highways Agency (UKHA) Design Manual for Roads and Bridges (DMRB) LA 111 Sustainability & Environmental Appraisal LA 111 Noise and Vibration Revision 2 (hereafter referred to as DMRB) (UKHA 2020).
- World Health Organisation Environmental Noise Guidelines for the European Region, 2018.
- Berglund, B, Lindvall, T, Schwela, D H & World Health Organisation, Guidelines for Community Noise, 1999.

9.2.1 FUNDAMENTALS OF ACOUSTICS

A sound wave travelling through the air is a regular disturbance of the atmospheric pressure. These pressure fluctuations are detected by the human ear, producing the sensation of hearing. To take account of the vast range of pressure levels that can be detected by the ear, it is convenient to measure sound in terms of a logarithmic ratio of sound pressures. These values are expressed as Sound Pressure Levels (SPL) in decibels (dB).

The audible range of sounds expressed in terms of Sound Pressure Levels (SPL) is 0dB (for the threshold of hearing) to 120dB (for the threshold of pain). In general, a subjective impression of doubling of loudness corresponds to a tenfold increase in sound energy which conveniently equates to a 10dB increase in SPL. It should be noted that a doubling in sound energy (such as may be caused by a doubling of traffic flows) increases the SPL by 3 dB.

The frequency of sound is the rate at which a sound wave oscillates is expressed in Hertz (Hz). The sensitivity of the human ear to different frequencies in the audible range is not uniform. For example, hearing sensitivity decreases markedly as frequency falls below 250Hz. In order to rank the SPL of various noise sources, the measured level has to be adjusted to give comparatively more weight to the frequencies that are readily detected by the human ear. The 'A-weighting' system defined in the international standard, BS ISO 226:2003 Acoustics. Normal Equal-loudness Level Contours has been found to provide the best correlations with human response to perceived loudness. SPL's measured using 'A-weighting' are expressed in terms of dB(A). An indication of the level of some common sounds on the dB(A) scale is presented in Figure 9.1.

Figure 9.1: dB(A) Scale & Indicative Noise Levels

(EPA: Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4 – 2016)).

9.2.2 CONSTRUCTION PHASE CRITERIA

9.2.2.1 General Construction

There is no published statutory Irish guidance relating to the maximum permissible noise level that may be generated during the construction phase of a project. Local authorities normally control construction activities by imposing limits on the hours of operation and/or applying noise limits for construction noise at noise-sensitive locations.

In the absence of specific noise limits, criteria relating to permissible construction noise levels for a development of this scale are taken from BS 5228:2009+A1:2014 *Code of Practice for Noise and Vibration Control on Construction and Open Sites* with respect to the controlling noise and vibration impacts. In this instance, appropriate criteria relating to permissible Construction Noise Threshold (CNT) values are taken from Part One of the standard *Noise*.

ABC Method

The approach adopted in BS 5228-1 calls for the designation of a noise sensitive location into a specific category (A, B or C) based on existing ambient noise levels in the absence of construction noise. This then sets a CNT value that, if exceeded at this location, indicates a potential significant noise impact is associated with the construction activities. Note that, in accordance with the BS5228 guidance, this assessment criterion is only applicable to residential receptors.

The BS 5228-1 document sets out guidance on permissible noise levels relative to the existing noise environment. Table 9.1 sets out the values which, when exceeded, signify a potential significant effect at the facades of residential receptors as recommended by BS 5228-1. These are construction noise levels only and not the cumulative noise level due to construction plus existing ambient noise.

Table 9.1: Example Threshold of a Potential Significant Effect at Dwellings

Assessment category and threshold value period (T)	Threshold value, in decibels (dB) (L_{Aeq})		
	Category A ^{Note A}	Category B ^{Note B}	Category C ^{Note C}
Night-time (23:00 to 07:00hrs)	45	50	55
Evenings and weekends ^{Note D}	55	60	65
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75

Note A Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.

Note B Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as category A values.

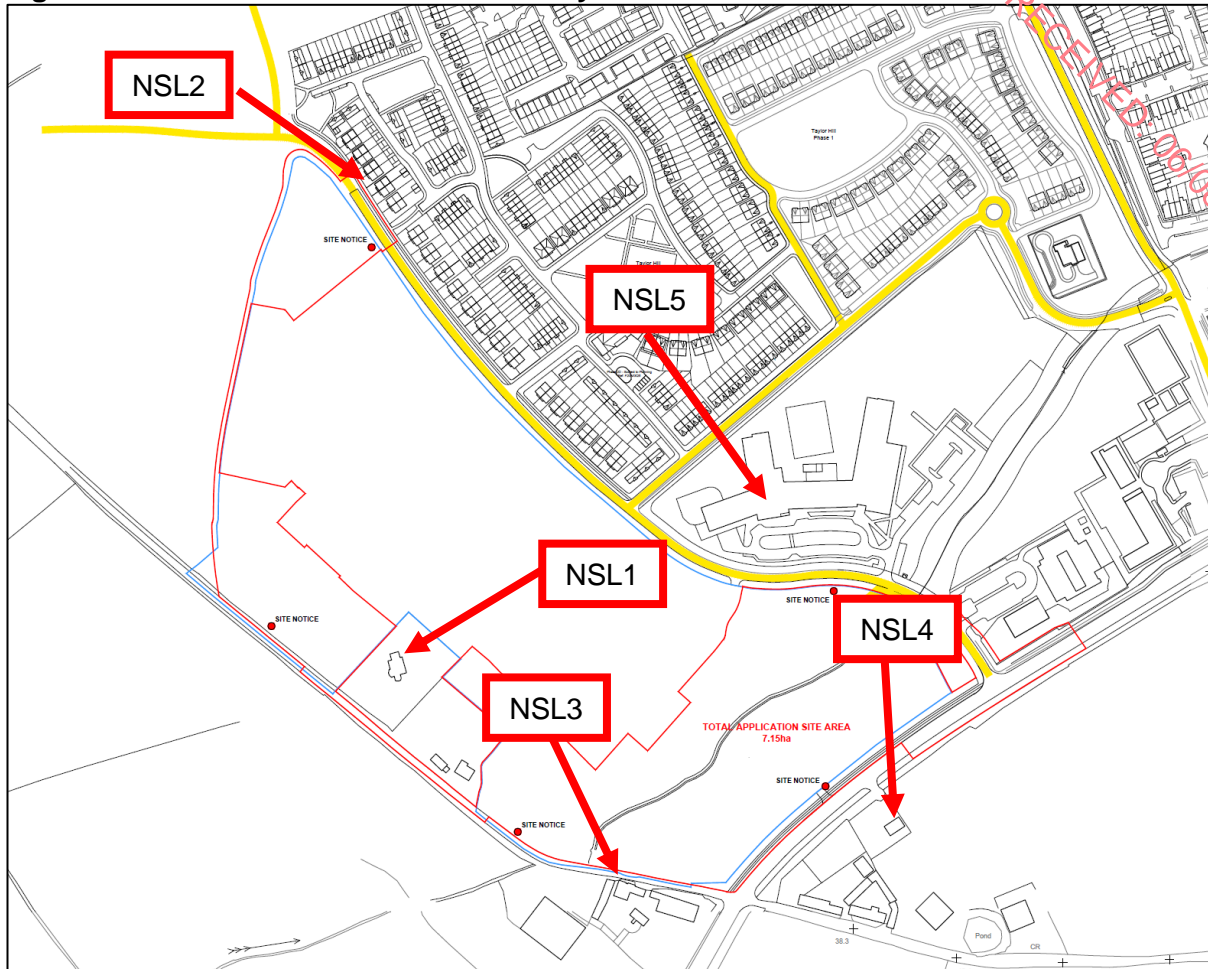
Note C Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than category A values.

Note D 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays.

It should be noted that this assessment method is only valid for residential properties. The approach is as follows: for each period (i.e. daytime, evening and nighttime) the ambient noise level is determined and rounded to the nearest 5 dB. Baseline monitoring carried out as part of this assessment would indicate that the categories detailed in Table 9.2 are appropriate in terms of the nearest noise sensitive locations (NSLs) being considered in this instance. These NSLs are described in Table 9.2, and their locations are indicated in Figure 9.2.

Table 9.2: Rounded baseline noise levels and Construction Noise Thresholds For properties

NSL Reference	NSL Description	Baseline Noise Category	Construction Noise Threshold Value $L_{Aeq,T}$ (dB)
NSL1	A property to the southwest of the proposed development at 10m from the site boundary.	B	70
NSL2	Multiple properties located approximately to the north of the proposed development, with the closest located at a distance of 30m from the boundary.	A	65
NSL3	A property to the south of the development, located 10m from the site boundary.	B	70
NSL4	A property to the southeast of the development, located 50m from the site boundary.	B	70
NSL5	A primary school, Colaise Ghlor Na Mara, located 30m northeast of the site boundary.	A	65

Figure 9.2: Closest NSLs to Site Boundary

These thresholds are for Daytime (07:00 – 19:00) and Saturdays (07:00 – 14:00) as construction is not expected to take place outside those hours.

Fixed Limits

When considering non-residential receptors, such as those sharing a boundary with the proposed development, BS 5228-1:2009+A1:2014 gives several examples of acceptable limits for construction noise, the most simplistic being based upon the exceedance of fixed noise limits. For example, paragraph E.2 states:

“Noise from construction and demolition sites should not exceed the level at which conversation in the nearest building would be difficult with the windows shut.”

Paragraph E.2 goes on to state: -

“Noise levels, between say 07.00 and 19.00 hours, outside the nearest window of the occupied room closest to the site boundary should not exceed: -

- 70 decibels (dBA) in rural, suburban areas away from main road traffic and industrial noise;
- 75 decibels (dBA) in urban areas near main roads in heavy industrial areas”.

Proposed Construction Threshold Noise Levels

Taking into account the proposed documents outlined above and making reference to the baseline noise environment monitored around the development site (see Section 9.3), BS 5228-1:2009+A1:2014 has been used to inform the assessment approach for construction noise.

The following Construction Noise Threshold (CNT) levels are proposed for the construction stage of this development:

- For residential NSLs it is considered appropriate to adopt 65 to 70 dB(A) CNT depending on existing noise level as described in Table 9.2. Given the baseline monitoring carried out, it would indicate that Category A to C values are appropriate using the ABC method.
- For non-residential NSLs it is considered appropriate to adopt the 75 dB(A) CNT, given the urban/industrial environment in which the proposed development is set, in line with BS5228-1 Annex E2.

Interpretation of the CNT

In order to assist with interpretation of CNTs, Table 9.3 includes guidance as to the likely magnitude of impact associated with construction activities, relative to the CNT. This guidance is derived from Table 3.16 of DMRB: Noise and Vibration and adapted to include the relevant significance effects from the EPA Guidelines (EPA 2022).

Table 9.3: Description of the magnitude of impacts. Adapted from DMRB Table 3.16

Construction Noise Level	Magnitude of Impact (DMRB)	EPA Significance of Effect
Below or equal Baseline Noise Level	Negligible	Not Significant
Above Baseline and below or equal to CNT	Minor	Slight – Moderate
Above threshold and below or equal to CNT + 5dB	Moderate	Moderate – Significant
Above CNT + 5dB up to CNT + 15dB	Major	Significant – Very Significant
Above CNT + 15dB		

The adapted DMRB guidance outlined will be used to assess the predicted construction noise levels at NSLs and comment on the likely impacts during the construction stages.

General Construction Phase Criteria – Vibration

There are two aspects to the issue of vibration that are addressed in the standards and guidelines: the risk of cosmetic or structural damage to buildings and human perception of vibration. In the case of this development, vibration levels used for the purposes of evaluating building protection and human comfort are expressed in terms of Peak Particle Velocity (PPV) in mm/s. There is no published statutory Irish guidance relating to the maximum permissible vibration level. The following standards are the most widely accepted in this context and are referenced here in relation to cosmetic or structural damage to buildings:

- BS 7385: Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from groundborne vibration (1993); and
- BS 5228: 2009 +A1 2014: Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration.

Building Damage

BS7385-2 and BS5228-2 advise that, for soundly constructed residential properties and similar light-framed structures that are generally in good repair, a threshold for minor or cosmetic (i.e. non-structural) damage should be taken as a peak component particle velocity (in frequency range of predominant pulse) of 15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz and 50 mm/s at 40 Hz and above for transient vibration. Where the dynamic loading caused by continuous vibration is such as to give rise to dynamic magnification due to resonance, especially at the lower frequencies where lower guide values apply, then the guide values in Table B.2 of BS5228-2 may need to be reduced by up to 50%. On a cautious basis, therefore, continuous vibration limits are set as 50% of those for transient vibration across all frequency ranges. For buildings or structures that are structurally unsound, lower vibration magnitudes will apply, typically 50% of those for structurally sound buildings. Protected or historic buildings are not automatically assumed to be more vulnerable to vibration unless they have existing structural defects. The values are summarised in Table 9.4.

Table 9.4: Description of the magnitude of impacts. Adapted from DMRB Table 3.16

Type of Building	Peak component particle velocity in frequency range of predominant pulse	
	4Hz to 15Hz	15Hz and above
Reinforced or framed structures Industrial and heavy commercial buildings.	50 mm/s at 4 Hz and above	
Unreinforced or light framed structures. Residential or light commercial building types.	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above.

Note 1 Values referred to are at the base of the building.*

Note 2 At frequencies below 4Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded.*

BS 5228-2 and BS 7485-2 state that minor structural damage can occur at vibration magnitudes greater than twice those in Table 9.4 and major structural damage can occur at vibration magnitudes greater than four times those in Table 9.4.

The guide values contained in Table 9.4 relate to predominantly transient vibration which does not give rise to resonant responses in structures, and to low rise buildings.

Human Perception

It is acknowledged that humans are particularly sensitive to vibration stimuli and that any perception of vibration may lead to concern. In the case of traffic, vibration is perceptible at around 0.5mm/s and may become disturbing or annoying at higher magnitudes. Higher levels of vibration, however, are typically tolerated for single events or events of short duration. For example, during piling, one of the primary sources of vibration during construction, vibration levels may typically be tolerated at up to 2.5mm/s. This guidance is applicable to the daytime only; it is unreasonable to expect people to be tolerant to such activities during the night-time (or if they are trying to sleep during the daytime).

BS 5228-2 also provides a useful guide relating to the assessment of human response to vibration in terms of the peak particle velocity (PPV). Table 9.5 below summarises the range of vibration values and the associated potential effects on humans.

Table 9.5: Guidance on effects of human response to PPV magnitudes

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.

Vibration Level, PPV	Effect
1 mm/s	It is likely that a vibration level of this magnitude in residential environments will cause complaint.
10 mm/s	Vibration is likely to be intolerable for any more than a brief exposure to this level

In order to assist with interpretation of vibration thresholds, Table 9.6 presents the significance table relating to potential impacts to building occupants during construction based on guidance from BS5228-2:2009+A1:2014.

Table 9.6: Human Response Vibration Significance Ratings

Vibration Level	Likely Effect (DMRB)	Significance Rating
≥10 mm/s PPV	Major	Moderate to Significant to Very Significant
≥1 to <10 mm/s PPV	Moderate	Moderate to Significant
≥0.3 to <1 mm/s PPV	Minor	Not Significant to Slight
≥0.14 to 0.3 mm/s PPV	Negligible	Imperceptible to Not significant
Less than 0.14 mm/s PPV		Imperceptible

Expected vibration levels from the construction works will be discussed further in Section 9.4.

9.2.3 OPERATIONAL PHASE CRITERIA

In this section, firstly, operational noise criteria are presented for a development of this nature.

9.2.3.1 Dublin Agglomeration Noise Action Plan 2019 – 2023

The Dublin Agglomeration NAP states the following with respect to assessing the noise impact on new residential development:

“Acoustic privacy is a measure of sound insulation between dwellings and between external and internal spaces. Development should have regard to the guidance on sound insulation and noise reduction for buildings contained in BS 8233:2014. The following principles are recommended for minimising disruption from noise in dwellings:

- Utilise the site and building layout to maximise acoustic privacy by providing good building separation within the development and from neighbouring buildings and noise sources*
- Arrange units within the development and the internal layout to minimise noise transmission by locating busy, noisy areas next to each other and quieter areas next to quiet areas*
- Keep stairs, lifts, and service and circulation areas away from noise-sensitive rooms like bedrooms. Particular attention should be paid to the siting and acoustic isolation of the lift motor room. Proposals close to noisy places, such as busy streets may need a noise impact assessment and mitigation plan.”*

9.2.3.2 ProPG: Planning & Noise

The Professional Guidance on Planning & Noise (ProPG) document was published in May 2017. The document was prepared by a working group comprising members of the Association of Noise Consultants (ANC), the Institute of Acoustics (IOA) and the Chartered Institute of Environmental Health (CIEH). Although not a UK or Irish government document, since its publication it has been generally considered as a best practice guidance and has been widely adopted in the absence of equivalent Irish guidance.

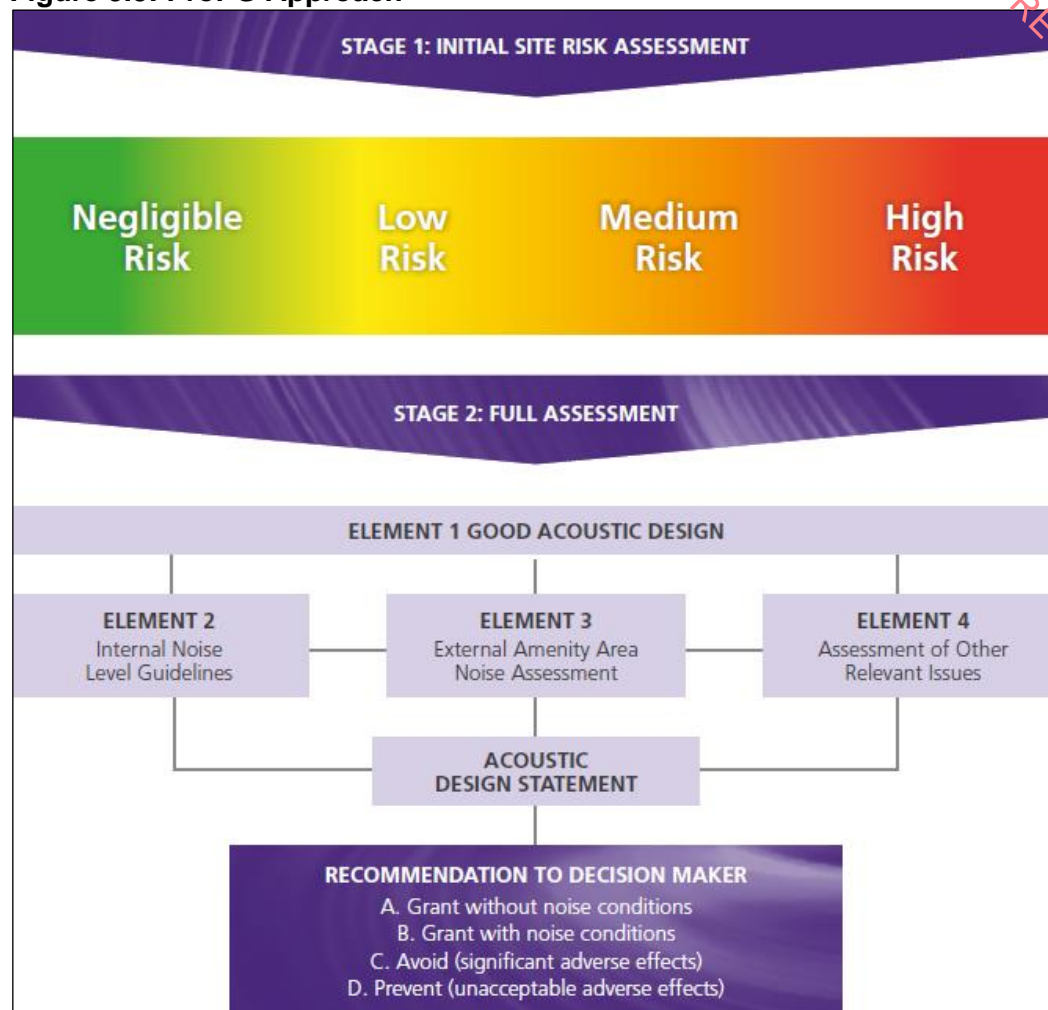
The ProPG outlines a systematic risk-based 2-stage approach for evaluating noise exposure on prospective sites for residential development. The two primary stages of the approach can be summarised as follows:

- Stage 1 – Comprises a high-level initial noise risk assessment of the proposed site considering either measured and or predicted noise levels; and,
- Environmental Stage 2 – Involves a full detailed appraisal of the proposed development covering four “key elements” that include:
 - Element 1 - Good Acoustic Design Process;
 - Element 2 - Noise Level Guidelines;
 - Element 3 - External Amenity Area Noise Assessment, and;
 - Element 4 - Other Relevant Issues.

A key component of the evaluation process is the preparation and delivery of an Acoustic Design Statement (ADS) which is intended for submission to the planning authority. This document is intended to clearly outline the methodology and findings of the Stage 1 and Stage 2 assessments, so as the planning authority can make an informed decision on the permission. ProPG outlines the following possible recommendations in relation to the findings of the ADS:

- A) Planning consent may be granted without any need for noise conditions;
- B) Planning consent may be granted subject to the inclusion of suitable noise conditions;
- C) Planning consent should be refused on noise grounds in order to avoid significant adverse effects (“avoid”); or,
- D) Planning consent should be refused on noise grounds in order to prevent unacceptable adverse effects (“prevent”).

Section 3.0 of the ProPG provides a more detailed guide on decision making to aid local authority planners on how to interpret the findings of an accompanying Acoustic Design Statement (ADS). A summary of the ProPG approach is illustrated in Figure 9.3.

Figure 9.3: ProPG Approach

(Source: ProPG)

9.2.3.3 WHO Environmental Noise Guidelines for Europe

The World Health Organisation (WHO) have published in October 2018 Environmental Noise Guidelines for the European Region. The objective of these guidelines is to provide recommendations for protecting human health from exposure to environmental noise from transportation, wind farm and leisure sources of noise. The guidelines present recommendations for each noise source type in terms of L_{den} and L_{night} levels above which there is risk of adverse health risks.

However, it should be noted that the WHO guideline values referred to here are recommended to serve as the basis for a policy-making process to allow evidence-based public health orientated recommendations. They are not intended to be noise limits and the WHO document states the following regarding the implementation of the guidelines,

“The WHO guideline values are evidence-based public health-oriented recommendations. As such, they are recommended to serve as the basis for a policy-making process in which policy options are considered. In the policy decisions on reference values, such as noise limits for a possible standard or legislation, additional considerations – such as feasibility, costs, preferences and so on – feature in and can influence the ultimate value chosen as a noise limit. WHO acknowledges that implementing the guideline recommendations will require coordinated effort from ministries, public and private sectors and nongovernmental organizations, as well as possible input from international development and finance organizations. WHO will work with Member States and support the implementation process through its regional and country offices.”

It is therefore not intended to refer to the WHO guidelines in an absolute sense as part of this assessment and it will be a decision for national and local policy makers to adopt the WHO guidelines and propose noise limits for use.

9.2.3.4 Internal Noise (BS 8233)

There are no statutory guidelines or specific local guidelines relating to appropriate internal noise levels in dwellings. In this instance, reference is made to BS 8233: 2014: Guidance on sound insulation and noise reduction for buildings.

BS 8233 sets out recommended internal noise levels for several different building types from external noise sources such as traffic. The guidance is primarily for use by designers and hence BS 8233 may be used as the basis for an appropriate schedule of noise control measures. The recommended indoor ambient noise levels for residential dwellings are set out in Table 9.7.

Table 9.7: Indoor Ambient Noise Levels for Dwellings from BS8233: 2014

Activity	Location	Day (07:00 to 23:00hrs) dB $L_{Aeq,16hr}$	Night (23:00 to 07:00hrs) dB $L_{Aeq,8hr}$
Resting	Living room	35	-
Dining	Dining room/area	40	-
Sleeping (daytime resting)	Bedroom	35	30

BS 8233 also provides some guidance on individual noise events, it states:

“Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or L_{AFmax} , depending on the character and number of events per night. Sporadic noise events could require separate values.”

Typically, a 45 dB L_{AFmax} criterion is applied to individual noise events within bedrooms at night. This criterion is generally considered a noise level that should not typically be exceeded.

9.2.3.5 Building Services Plant Noise

The most appropriate standard used to assess the impact of a new continuous source (i.e. plant items) to a residential environment is BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound. This standard describes a method for assessing the impact of a specific noise source at a specific location with respect to the increase in “background” noise level that the specific noise source generates. The standard provides the following definitions that are pertinent to this application:

- “Specific sound level, $L_{Aeq, Tr}$ ” is equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T . This level has been determined with reference to manufacturers information for specific plant items.
- “Rating level” $L_{Ar, Tr}$ is the specific noise level plus adjustments for the character features of the sound (if any), and;
- “Background noise level” is the sound A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T . This level is expressed using the L_{A90} parameter. These levels were measured as part of the baseline survey.

The assessment procedure in BS4142 is outlined as follows:

1. determine the specific noise level;
2. determine the rating level as appropriate;
3. determine the background noise level, and;

4. subtract the background noise level from the specific noise level in order to calculate the assessment level.

The lower the rating level is relative to the measured background sound level, the less likely it is that the specific source will have an adverse impact or a significant adverse impact. A difference of +10dB or more is a likely to be an indication of a significant adverse impact. A difference of around +5dB is likely to be an indication of an adverse impact, dependent on the context. Where the rated plant noise level is equivalent to the background noise level, noise effects are typically considered to be neutral.

9.2.3.6 Additional Vehicular Traffic on Surrounding Roads

In order to consider the potential noise impact associated with the proposed development introducing additional traffic onto the existing road networks and given that vehicle movements on public roads are assessed using a different parameter (the ten-percentile noise level; LA10), it is appropriate to consider the increase in traffic noise level that arises as a result of vehicular movements associated with the development in terms of the LA10 parameter.

In order to assist with the interpretation of the noise associated with vehicular traffic on public roads, Table 9.8 offers guidance as to the likely impact associated with any change in traffic noise level (Source DMRB).

Table 9.8: Likely Impact Associated Change in Traffic Noise Level

Change in Sound Level (dB)	Subjective Reaction	DMRB Magnitude of Impact (Short-term)	EPA Significance of Effect
0-0.9	Inaudible	Negligible	Imperceptible
1 – 2.9	Barely Perceptible		Not Significant
3 – 4.9	Perceptible	Minor	Slight, Moderate
5 – 9.9	Up to a doubling of loudness	Moderate	Significant
10.0+	Doubling of loudness and above	Major	Very Significant

9.2.3.7 Vibration

It is not anticipated that there will be any operational impact associated with vibration.

9.2.4 FORECASTING METHODS

Construction noise calculations have been conducted in accordance with BS 5228: 2009+A1:2014: *Code of practice for noise control on construction and open sites - Noise*.

Prediction calculations for site noise have been conducted in accordance with ISO 9613 (1996): *Acoustics – Attenuation of sound outdoors – Part 2: General method of calculation*.

Changes in road traffic noise on the local road network have been considered using prediction guidance contained within *Calculation of Road Traffic Noise* (CRTN) issued by the Department of Transport in 1988.

9.2.5 DIFFICULTIES ENCOUNTERED

No difficulties were encountered in the preparation of this Chapter.

9.3 BASELINE RECEIVING ENVIRONMENT

9.3.1 BASELINE NOISE SURVEY

An attended noise survey was conducted in proximity to the nearest noise sensitive locations to the site in order to establish the current noise climate and the main contributors to the noise environment in these areas. This was done in conjunction with an unattended survey, which was carried out on the site itself for a period of over 24 hours. The surveys were conducted in general accordance with ISO 1996: 2017: *Acoustics – Description, measurement and assessment of environmental noise*. Specific details are set out below.

9.3.1.1 Measurement Locations

The noise survey locations are described below and illustrated in Figure 9.4.

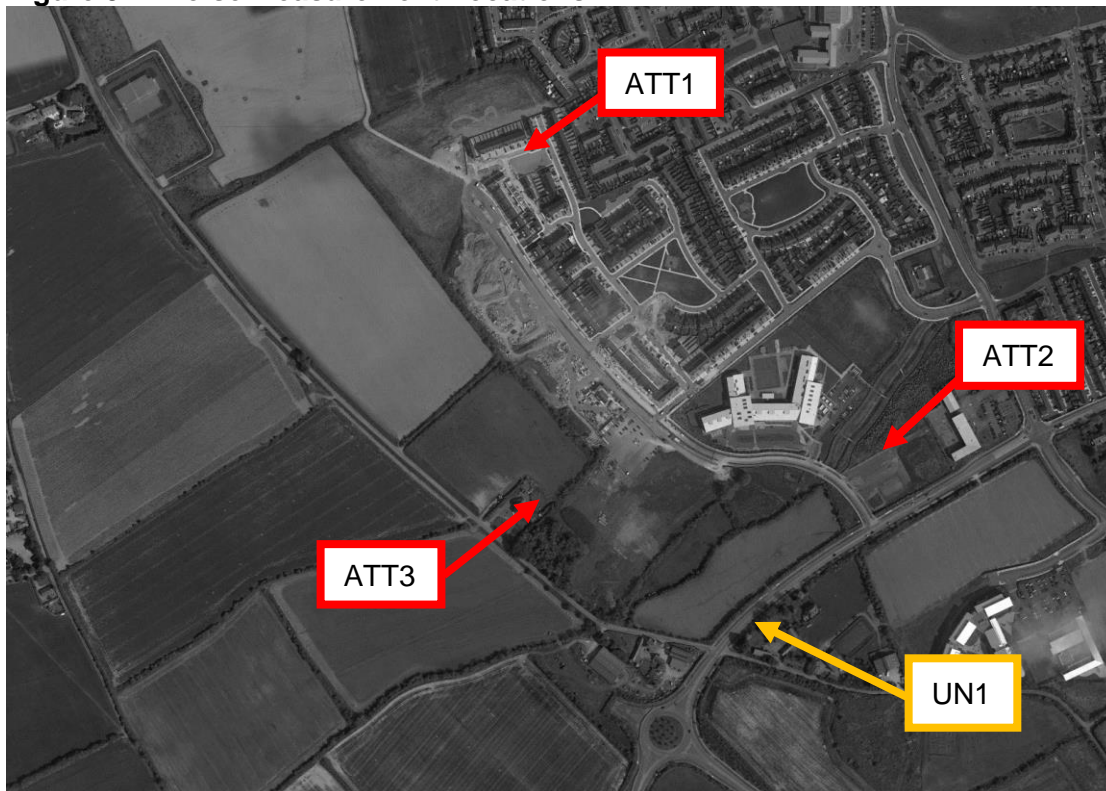
Location ATT1 Attended survey location, located to the northwest of the site, this location characterises the noise environment at the western end of Taylor Hill Gardens Road. It is representative of noise levels outside the houses of the Taylor Hill estate, far away from Clonard road, with a direct line of sight to the proposed development.

Location ATT2 This attended survey location, located to the northeast of the site on of Taylor Hill boulevard characterises the noise environment incident on Coláiste Ghlór na Mara.

Location ATT3 This attended survey location, located to the South of the site on Clonard road, represents the noise environment incident on Helga's Pre-School.

Location UN1 Unattended survey location, located to the southeast corner of the site at the junction where Clonard road merges with the R122. It represents the noisiest environment due to traffic adjacent the site.

Figure 9.4: Noise Measurement Locations



Identified on a Google Earth Aerial Photograph

9.3.1.2 Survey Periods and Instrumentation

The survey was conducted during the following periods.

- Attended measurements: 11:06hrs to 15:04hrs on the 22nd of February 2024, and
- Unattended measurements: 9:55hrs on the 28th of February 2024 to 9:10hrs on the 4th of March 2024.

The measurements were performed using the following equipment:

Table 9.9: Noise Monitoring Equipment Details

Type	Manufacturer	Equipment Model	Serial Number	Microphone	Calibration Date	Calibration Due
Sound Level Meter	NTiAudio	XL2	A2A-11092-E0	A14302	03/05/2022	03/05/2024
Sound Level Meter	Rion	NL-52	1076330	12055	13/01/2023	13/01/2025
Calibrator	Bruel and Kjaer	Type 4231	2205805	N/A	25/10/2023	25/10/2024

Each microphone was protected using a proprietary windshield. Before and after the survey the measurement apparatus was calibrated using the calibrator detailed above.

Each calibrator produces a sound level of 93.8 dB re. 2×10^{-5} Pa, at a frequency of 1kHz. The instrumentation used was calibrated before and after use to an accuracy of ± 0.2 dB. The calibration certificates are available upon request.

9.3.1.3 Survey Periods and Instrumentation

The weather during the daytime survey periods was dry with a clear sky and moderate wind speeds that were measured below 5 m/s.

9.3.1.4 Survey Parameters

The following parameters were measured during the survey.

- L_{Aeq} This is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period (T). It is used to characterise the ambient noise level.
- L_{AFmax} The maximum rms A-weighted sound pressure level occurring within a specified time period. Measured using the “Fast” time weighting.
- L_{AF90} Refers to those A-weighted noise levels in the lower 90 percentile of the sampling interval; it is the level which is exceeded for 90% of the measurement period. It will therefore exclude the intermittent features of traffic and is used to describe a background level.

Noise levels were logged over 15-minute sampling periods over the course of the survey periods.

9.3.1.5 Attended Measurements

Location ATT1

The survey results for Location ATT1 are summarised in Table 9.10.

Table 9.10: Result of Baseline Noise Survey at Location ATT1

Location	Period	Measured Noise Levels, dB re 2×10^{-5} Pa		
		L _{Aeq,15min}	L _{AFmax,15min}	L _{AF90,15min}
Location ATT1	11:06 – 11:21	52	68	51
	12:33 - 12:48	52	69	50
	14:02 - 14:17	53	66	50

The results of the baseline survey at this location were measured in the range of 52 to 53 dB L_{Aeq} with background noise levels measured in the range of 50 to 51 dB L_{A90}. Construction Noise was noted to be the main source of noise at this location with occasional aircraft noise as well as birdsong and continuous distant traffic noise.

Location ATT2

The survey results for Location ATT2 are summarised in Table 9.11.

Table 9.11: Result of Baseline Noise Survey at Location ATT2

Location	Period	Measured Noise Levels, dB re 2×10^{-5} Pa		
		L _{Aeq,15min}	L _{AFmax,15min}	L _{AF90,15min}
Location ATT2	11:36 – 11:51	60	78	54
	12:55 - 13:11	64	79	59
	14:26 - 14:41	65	81	58

Noise levels measured at this location were in the range of 60 to 65 dB L_{Aeq}. The main noise source noted at this location was construction noise with activity directly 20 to 50m from the survey location. Passing road traffic was also audible. The background noise environment was measured in the range of 34 to 58 dB L_{A90}.

Location ATT3

The survey results for Location ATT3 are summarised in Table 9.12.

Table 9.12: Result of Baseline Noise Survey at Location ATT3

Location	Period	Measured Noise Levels, dB re 2×10^{-5} Pa		
		L _{Aeq,15min}	L _{AFmax,15min}	L _{AF90,15min}
Location ATT3	12:06 – 12:21	71	89	54
	13:37 - 13:52	70	86	54
	14:49 - 15:04	70	87	54

Noise levels measured at this location were in the range of 70 to 71 dB L_{Aeq}. The main noise source noted at this location was passing road traffic. Birdsong and continuous distant car traffic were also audible, construction noise was not. The background noise environment was measured in the range of 54 dB L_{A90}.

Unattended Measurements

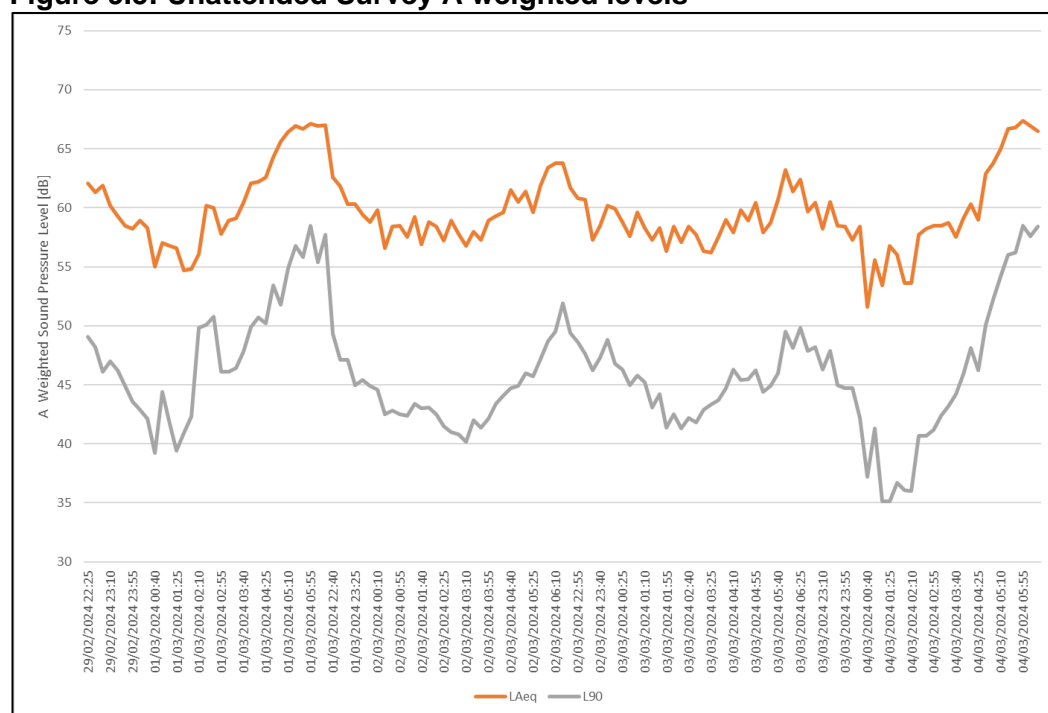
When carrying out the install and collection of the unattended survey kit, traffic noise was dominant and construction noise was distant and only audible at times. The average levels are calculated using arithmetic and logarithmic averages for the L_{A90} and L_{Aeq} respectively. The average levels are presented

in Table 9.13 below for each time period. The L_{Aeq} and the L_{90} recorded over the survey are presented in Figure 9.5.

Table 9.13: Unattended Measurements Results

Time Periods	Noise Levels (dB re. 2×10^{-5} Pa)	
	$L_{Aeq}(1hr)$	L_{90}
Daytime 07:00 to 19:00hrs	67	57
Evening 19:00 to 23:00hrs	64	53
Night 23:00 to 07:00hrs	61	46

Figure 9.5: Unattended Survey A weighted levels



9.3.2 VIBRATION

It is not expected that vibration would be measured of a magnitude to exceed the building damage criteria, or that vibration will be perceptible on site with the potential to cause adverse comment.

9.4 POTENTIAL IMPACTS

9.4.1 CONSTRUCTION STAGE

9.4.1.1 Construction Noise

The construction stage will be undertaken over a number of phases from site preparation through to building construction and internal fit out. In terms of the potential noise and vibration impacts, the key stages and activities are expected to involve:

- Site clearance and demolition of existing structures;
- Ground works (excavation and piling);
- Superstructure Construction; and
- Internal fit out.

The following section discusses typical noise levels associated with the proposed development demolition/construction phase and comments on potential noise impacts at distances to the nearest Noise Sensitive Locations (NSLs) during the key stages and types of activities that will occur on site.

9.4.1.2 Rock Breaking

There will be periods when breakers will be required to break out buried rocks. For this specific activity a total construction noise level of 92 dB L_{Aeq} at 10m has been used for the purposes of indicative calculations.

9.4.1.3 Excavation and Piling

For construction works associated with activities such as excavation and structural works including excavators, loaders, dozers, cranes, generators, concreting works and continuous flight augured piling etc. noise levels are typically in the range of 70 to 82 dB L_{Aeq} at 10m. Non-percussive piling methods will be employed on the site.

9.4.1.4 Construction of Proposed Structure

For construction work areas with lower noise levels such as those associated with superstructure works including site compounds (for storage, offices and material handling, generators etc.), smaller items of mobile plant (excavators, cranes, dozers), landscaping and concreting works with lower noise emissions, a total construction noise level of 80 dB L_{Aeq} at 10m has been used for the purposes of indicative calculations. This would include, for example two items of plant at 75 dB L_{Aeq} and three items of plant at 70 dB L_{Aeq} operating simultaneously within a work area.

9.4.1.5 Indicative Construction Noise Levels

Indictive noise calculations have been undertaken which assume that plant items are operating for 66% of the time. Screening from a standard site hoarding of 2.4m is assumed around all site boundaries. It must be stated that for most of the time, plant and equipment will be a greater distance from the nearest NSLs than those used within the calculations and the “on-time” of plant and equipment will be less than those assumed over a normal working day (i.e. the use of piling rigs or breakers for demolition will be in use for shorter periods than those assumed over a normal working day) and consequently will have lower noise levels. The assessment presented is therefore representative of a best estimate conservative scenario representing construction activities. Table 9.14 presents the calculated noise levels at varying distances.

Table 9.14: Calculated Construction Noise Levels at Varying Distances

Activity	Predicted Construction Noise Level $L_{Aeq}(1hour)$ (dB)					
	10m	20m	30m	40m	50m	100m
Rock Breaking	85	79	75	73	71	65
Excavations and Piling Works	75	69	65	63	61	56
General Site Work including Superstructure and Fit out	73	67	63	61	59	53

Reference to the construction noise levels in Table 9.19 indicate that the CNT of 65 dB $L_{Aeq,T}$ will be exceeded at the closest NSLs when activities are occurring along the closest site boundaries. However, a range of noise levels will occur as works take place across the site.

During rock breaking works, the CNT is likely to be exceeded at the closest NSLs when breakers are operating on site and other high noise activities associated with this phase. This will be the shortest phase of works and the use of breakers will only occur for a portion of this phase at the site.

During piling works noise levels will be within the threshold at receptors NSL2, NSL4 and NSL5 which are located at 30m distance or greater from the site. Construction noise levels at 10m where NSL1 and NSL3 are located, are calculated at 75 dB $L_{Aeq,T}$ which is over the construction noise threshold. Whilst the calculated noise levels are above the potential significance threshold of 70 dB $L_{Aeq,T}$, construction noise levels reaching 75 dB for temporary periods of time, and when only at the boundary of the site can be tolerated once advance notice is given to the NSL of the extent, timing and duration of the works. It should be noted that this will only occur for brief periods when piling occurs at the closest boundary to these receptors. For the majority of the works piling will take place at distances far greater than this and, hence, noise levels will be reduced at these locations.

During the general site construction works involving construction of the site buildings, lower noise levels will be generated on site. There is potential for the CNT to be exceeded by a small margin at NSL1 and NSL3 when works take place immediately along the boundaries. When works are occurring at 25m or greater distances from these NSLs the works are calculated to be within the CNT.

Overall, any rock breaking works are likely to cause a significant impact at bounding receptors, however this will be shortest phase of works and the use of breakers will only occur for a portion of this phase at the site. During this activity the impact is considered to be **negative, moderate to significant and temporary**.

At NSL2, NSL4 and NSL5 the remaining works are calculated to be within the construction noise thresholds and hence for these activities the impact is considered to be **negative, slight to moderate and temporary**.

At NSL1 and NSL3 piling and general construction works have the potential to exceed the threshold when working within 25m of the NSLs. The resultant impact at these locations will range from **moderate to significant**, however it should be noted that for the majority of the construction phases it is expected that noise levels will be below the threshold at these locations, with the threshold only being exceeded for portions of the works taking place immediately adjacent to the receptors.

A suite of mitigation measures is provided in Section 9.5 in order to minimise construction impacts.

9.4.1.6 Construction Vibration

Expected vibration levels during piling assuming augured or bored piles have been determined through reference to published empirical data. The British Standard BS 5228 – Part 2: Vibration, publishes the measured magnitude of vibration of rotary bored piling using a 600mm pile diameter for bored piling into soft ground over rock, (Table D.6, Ref. No. 106):

- 0.54mm/s at a distance of 5m, for auguring;
- 0.22mm/s at a distance of 5m, for twisting in casing; Site clearance and demolition of existing structures;
- 0.42mm/s at a distance of 5m, for spinning off, and;
- 0.43mm/s at a distance of 5m, for boring with rock auger.

Taking into account the distance to the closest off-site sensitive buildings on all perimeters, vibration emissions from this activity will be significantly reduced. Vibration levels at the closest neighbouring buildings will be orders of magnitude below the limits set out in Table 3 to avoid any cosmetic damage to buildings and will be below the thresholds for human perception. The impacts are predicted to be short-term, negative and not significant.

During rock breaking, there is potential for vibration to be generated through the ground. Empirical data for this activity is not provided in the BS 5228-2:2009+A1:2014 (BSI 2014b) standard, however the likely level of vibration from this activity is expected to be significantly below the vibration criteria for building

damage on experience from other sites. AWN Consulting Ltd have previously conducted vibration measurements under controlled conditions, during trial construction works, where breaking was carried out. The trial construction works consisted of the use of the following plant and equipment when measured at various distances:

- 3 tonne hydraulic breaker on small CAT tracked excavator; and
- 6 tonne hydraulic breaker on large Liebherr tracked excavator.

Vibration measurements were conducted during various staged activities and at various distances. Peak vibration levels during staged activities using the 3 Tonne Breaker ranged from 0.48 PPV (mm/s) to 0.25 PPV (mm/s) at distances of 10m to 50m respectively from the breaking activities. Using a 6 Tonne Breaker, measured vibration levels ranged between 1.4 PPV (mm/s) to 0.24 PPV (mm/s) at distances of 10m to 50m respectively.

Whilst these measurements relate to a breaking of concrete, the range of values recorded provides some context in relation typical ranges of vibration generated by construction breaking activity. The vibration levels experienced at surrounding receptors will be well below the criteria of cosmetic building damage, however, it will likely be perceptible when work is taking place at the closest locations to the receptors. Notwithstanding the above, any construction activities undertaken on the site will be required to operate below the recommended vibration criteria set out in Table 9.5.

In terms of disturbance to building occupants, works undertaken within close proximity to the residential receptors on the site perimeter have the potential to emit perceptible vibration levels, hence the impact is considered to be of **slight to moderate and temporary impact**.

Notwithstanding the above, any construction activities undertaken on the site will be required to operate below the recommended vibration criteria set out in Table 9.5 during all activities. Mitigation and management of these works are discussed in 9.5.

9.4.2 OPERATIONAL PHASE OUTWARD NOISE ASSESSMENT

9.4.2.1 Operational Phase Traffic Noise Assessment

A traffic impact assessment relating to the proposed development has been prepared as part of this planning assessment. Information from this report has been used to determine the predicted change in noise levels in the vicinity of a number of roads in the area surrounding the proposed development, for the opening and design years.

For the purposes of assessing potential noise impact, it is appropriate to consider the relative increase in noise level associated with traffic movements on existing roads and junctions with and without the development. Note that this is a cumulative assessment that includes data for every phase of the overall masterplan. The results are presented in Table 9.15 and Table 9.16.

The results indicate that the effect due to noise from a change in traffic volumes will be **imperceptible and long-term**.

Table 9.15: Predicted Change in Noise Level for the Opening Year

Road	AADT Flow		Change in Noise Level (dB)
	DM	DS	
Boulevard Rd	6,594	7,293	+0.4
R122 W	20,129	20,629	+0.1
R122 E	17,633	17,832	+0.0

Table 9.16: Predicted Change in Noise Level for the Opening Year + 15

Road	AADT Flow		Change in Noise Level (dB)
	DM	DS	
Boulevard Rd	6,832	7,530	+0.4
R122 W	23,532	24,031	+0.1
R122 E	20,971	21,170	+0.0

9.4.2.2 Building Services Plant

Once operational, there will be building services plant items required to serve the residential aspect of the development. These will typically be limited to heating and cooling plant and extract units, depending on the building design and user requirements. Given the use of these buildings, the majority of plant items are likely to be required during daytime hours only; however, there may be requirement for a night-time operational plant, depending on specific requirements.

The location or type of building services plant has not yet been established; therefore, it is not possible to calculate noise levels to the surrounding environment. In this instance, is it best practice to set appropriate noise limits that will inform the detailed design during the selection and layout of building services for the development.

These items will be selected at a later stage, however, they will be designed and located so that there is no negative impact on sensitive receivers within the development itself. The cumulative operational noise level from building services plant at the nearest noise-sensitive location within the development (e.g. apartments, etc.) will be designed/attenuated to meet the relevant BS 4142 noise criteria for day and night-time periods as set out in this assessment. Based on the baseline noise data collected for this assessment it is considered an appropriate design criterion is the order of 50 dB $L_{Aeq,15min}$ during the day period, and 45 dB $L_{Aeq,15min}$ during the night period.

In terms of noise associated with day-to-day activities the associated effect is stated to be **negative, not significant, long-term**.

9.4.3 OPERATIONAL PHASE INWARD NOISE ASSESSMENT

9.4.3.1 Stage 1 – ProPG Noise Risk Classification of the Site

Giving consideration to the measured noise levels presented in the previous sections the initial site noise risk assessment has concluded that there is a low to medium level of noise risk across the site.

Additionally, the Stage 1 Noise Risk Assessment requires analyses of the L_{AFmax} noise levels. In the case of the AWN survey, the L_{AFmax} noise levels measured less than 80 dB. ProPG guidance considers 20-night events over 80 dB to be a high risk, therefore this site would be considered a low to medium risk in terms of maxima events.

ProPG states the following with respect to medium risk:

Medium Risk As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised, and which clearly demonstrate that a significant adverse noise impact will be avoided in the finished development.

Given the above an Acoustic Design Strategy is required to demonstrate that suitable care and attention has been applied in mitigating and minimising noise impact to such an extent that an adverse noise impact will be avoided in the final development.

9.4.3.2 Stage 2 – Acoustic Design Strategy

Discussion on Open Windows

In the first instance, it is important to note the typical level of sound reduction offered by a partially open window falls in the region of 10 to 15 dB.

Considering the design goals outlined in Table 9.7 and a sound reduction across an open window of 15 dB, the free-field noise levels that would be required to ensure that internal noise levels do not exceed good (i.e. at or below the internal noise levels) or reasonable internal noise levels (i.e. 5 dB above the internal noise levels) have been summarised in Table 9.17.

Table 9.17: ProPG External Noise Levels to Achieve Reasonable Internal Noise Levels with Windows Open

Activity	(07:00 to 23:00hrs)	(23:00 to 07:00hrs)
Resting	50 - 55 dB $L_{Aeq, 16hr}$	45 dB $L_{Aeq, 8hr}$
Dining	55 - 60 dB $L_{Aeq, 16hr}$	-

In this instance, the external noise levels are such that for properties bounding Clonard Road it will not be possible to achieve the desired good internal noise levels with windows open and therefore appropriate acoustic specifications to windows and passive vents will be provided to ensure these rooms are adequately ventilated and achieve the good internal noise levels detailed here. Properties located further from the existing bounding roads will not require upgraded glazing or ventilation.

External Noise Levels for External Amenity Areas

ProPG provides the following advice with regards to external noise levels for amenity areas in the development:

“The acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50 – 55 dB $L_{Aeq, 16hr}$.”

Generally, the private external amenity space for this proposed development is shielded from heavily trafficked roads like the R122 and so the vast majority of private amenity space will meet the ProPG guideline values. It is noted that there are small number of garden areas that face onto the R122, these spaces have the potential exceed the recommended guidance noise levels. However, the ProPG document allows for the impact of higher than desirable external noise levels to be offset through assessment of a hierarchy of measures including “a relatively quiet, protected, nearby, external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings” or “a relatively quiet, protected, publicly accessible, external amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5 minutes walking distance)”. In there are various communal amenity spaces planned as part of the proposed development that are adequately shielded from the bounding roads, hence they are predicted to meet the external guidelines noise levels.

Overall, the development is predicted to be in line with ProPG guidance for external areas, hence the impact is considered to be not significant.

9.5 MITIGATION MEASURES

9.5.1 CONSTRUCTION PHASE MITIGATION

With regard to construction activities, best practice operational and control measures for noise and vibration from construction sites are found within BS 5228 (2009 +A1 2014) Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2.

BS5228 includes guidance on several aspects of construction site practices, including, but not limited to:

- Selection of quiet plant.
- Control of noise sources.
- Screening (boundary, and or localised plant screening).
- Hours of work.
- Liaison with the public.
- Monitoring.

Detailed comment is offered on these items in the following paragraphs. Noise control measures that will be considered include the selection of quiet plant, enclosures and screens around noise sources, limiting the hours of work and noise monitoring.

9.5.1.1 Selection of Quiet Plant

This practice is recommended in relation to sites with static plant such as compressors and generators. It is recommended that these units be supplied with manufacturers' proprietary acoustic enclosures where possible. The potential for any item of plant to generate noise will be assessed prior to the item being brought onto the site. The least noisy item should be selected wherever possible.

9.5.1.2 Noise Control at Source

If replacing a noisy item of plant is not a viable or practical option, consideration should be given to noise control "at source". This refers to the modification of an item of plant or the application of improved sound reduction methods in consultation with the supplier. For example, resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can often be controlled by fixing resilient materials in between the surfaces in contact.

BS5228 states that "as far as reasonably practicable sources of significant noise should be enclosed". In applying this guidance, constraints such as mobility, ventilation, access and safety must be taken into account. Items suitable for enclosure include pumps and generators.

BS5228 makes a number of recommendations in relation to "*use and siting of equipment*". These are all directly relevant and hence are reproduced below. These recommendations will be adopted on site.

"Plant should always be used in accordance with manufacturers' instructions. Care should be taken to site equipment away from noise-sensitive areas. Where possible, loading and unloading should also be carried out away from such areas.

Machines such as cranes that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum. Machines should not be left running unnecessarily, as this can be noisy and waste energy.

Plant known to emit noise strongly in one direction should, when possible, be orientated so that the noise is directed away from noise-sensitive areas. Attendant operators of the plant can also benefit from this acoustical phenomenon by sheltering, when possible, in the area with reduced noise levels.

*Acoustic covers to engines should be kept closed when the engines are in use and idling. The use of compressors that have effective acoustic enclosures and are designed to operate when their access panels are closed is recommended.**

Materials should be lowered whenever practicable and should not be dropped. The surfaces on to which the materials are being moved could be covered by resilient material."

Other forms of noise control at source relevant to the development works are set out below:

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- For mobile plant items such as cranes, dump trucks, excavators and loaders, the installation of an acoustic exhaust and or maintaining enclosure panels closed during operation can reduce noise levels by up to 10dB. Mobile plant should be switched off when not in use and not left idling.
- For percussive tools such as pneumatic concrete breakers and tools a number of noise control measures include fitting muffler or sound reducing equipment to the breaker 'tool' and ensure any leaks in the air lines are sealed. Erect localised screens around breaker or drill bit when in operation in close proximity to noise sensitive boundaries.
- For concrete mixers, control measures should be employed during cleaning to ensure no impulsive hammering is undertaken at the mixer drum.
- For all materials handling ensure that materials are not dropped from excessive heights, lining drops chutes and dump trucks with resilient materials.
- Demountable enclosures can also be used to screen operatives using hand tools/ breakers and will be moved around site as necessary.
- All items of plant should be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures.

9.5.1.3 Screening

Typically, screening is an effective method of reducing the noise level at a receiver location and can be used successfully as an additional measure to all other forms of noise control. The effectiveness of a noise screen will depend on the height and length of the screen and its position relative to both the source and receiver.

Screening may be a useful form of noise control when works are taking place at basement and ground level to screen noise levels at ground floor adjacent buildings.

In addition, careful planning of the site layout should also be considered. The placement of site buildings such as offices and stores and in some instances materials such as aggregate can provide a degree of noise screening if placed between the source and the receiver. The use of localised mobile (mobile hoarding screens and / or acoustic quilts) to items of plant with the potential to generate high levels of noise are an effective noise control measure. These options should be considered when percussive works are taking place in close proximity to the nearest sensitive perimeter buildings.

9.5.1.4 Liaison with the Public

A designated noise liaison should be appointed to site during construction works. All noise complaints should be logged and followed up in a prompt fashion by the liaison officer. In addition, prior to particularly noisy construction activity, e.g. demolition, breaking, piling, etc., the liaison officer should inform the nearest noise sensitive locations of the time and expected duration of the noisy works.

9.5.1.5 Hours of Work

Construction works will be undertaken within the times below, taken from the Section 6 of the Draft Construction Management Plan:

- Monday to Friday: 07:00 to 19:00hrs
- Saturday: 07:00 to 14:00hrs
- Sunday and Public Holidays: No noisy work on site.

9.5.2 OPERATION PHASE MITIGATION

The British Standard BS EN 12354-3: 2000: Building acoustics – Estimation of acoustic performance of buildings from the performance of elements – Part 3: Airborne sound insulation against outdoor sound provides a calculation methodology for determining the sound insulation performance of the external envelope of a building. The method is based on an elemental analysis of the building envelope and can take into account both the direct and flanking transmission paths.

The Standard allows the acoustic performance of the building to be assessed taking into account the following:

- Construction type of each element (i.e. windows, walls, etc.);
- Area of each element;
- Shape of the façade, and;
- Characteristics of the receiving room.

The principles outlined in BS EN 12354-3 are also referred to in BS8233 and Annex G of BS8233 provides a calculation method to determine the internal noise level within a building using the composite sound insulation performance calculated using the methods outlined in BS EN 12354-3. The methodology outlined in Annex G of BS8233 has been adopted here to determine the required performance of the building facades. This approach corrects the noise levels to account for the frequency content of the source in question. In this instance, rail and road traffic noise, depending on the buildings in question. For properties with cumulative impacts from both rail and road, the frequency content of the dominant source has been used for calculations.

As is the case in most buildings, the glazed elements of the building envelope are typically the weakest element from a sound insulation perspective. Table 9.18 and Table 9.19 provide the calculated specification for glazing and ventilation, respectively. Facades where the glazing and ventilation are required are presented in Figure 9.6.

Table 9.18: Sound Insulation Performance Requirements for Glazing, SRI (dB)

Facade	Octave Band Centre Frequency (Hz)						R _w
	125	250	500	1k	2k	4k	
RED	24	25	32	41	38	46	36

Table 9.19: Sound Insulation Performance Requirements for Ventilation, SRI (dB)

Facade	Octave Band Centre Frequency (Hz)						D _{ne,w}
	125	250	500	1k	2k	4k	
RED	30	33	38	37	36	36	38