

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

VOLUME II - EIAR



**PROPOSED RESIDENTIAL DEVELOPMENT
AT
Bridgeway, Rathgory & Mulladrillen,
Drogheda Road, Ardee, County Louth**

Prepared by



In Conjunction with:

Darmody Architecture, CS Consulting Engineers, Altamar Ecological Services, Awn Consulting, Wildlife Surveys Ireland, Stephen Diamond Associates Landscape Architecture, ASCU Archaeology, Arkmount Construction Limited.

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1.0 INTRODUCTION AND METHODOLOGY

John Spain Associates, Planning & Development Consultants, have been commissioned by The Ardee Partnership, the applicant of the proposed strategic housing development, to prepare an Environmental Impact Assessment Report (EIAR) for a proposed development at Bridgewater, Ardee, County Louth. This chapter of the EIAR was prepared by Ian Livingstone MA Honours, MSc., MRTPI, Associate Director with John Spain Associates and verified by Rory Kunz, BA (MOD), MScERM, MAT&CP, Dip EIA Mgmt., Executive Director with John Spain Associates.

The central purpose of the Environmental Impact Assessment Report (EIAR) 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 EIAR. This is then submitted to the competent/ consent authority to enable it to assess the likely significant effects of the project on the environment. This assessment will then inform the decision as to whether the development should be permitted to proceed.

A full description of the proposed development is provided in Chapter 2 of this EIAR document. In summary, the proposal comprises 272 no. residential dwellings (206 no. houses and 66 no. duplexes), crèche, community building, a public park (c. 3.62 ha) and public space throughout the scheme including a riparian corridor at the realigned Rathgory Tributary, car and bicycle parking and all access, drainage infrastructure and associated works to facilitate the development. Provision is made for road connection with lands to the east in accordance with Louth County Development Plan 2021-2027 Objective SS 42 by the proposed extension of Bridgewater Avenue to the eastern perimeter. The total site area is c. 13.03 ha.

Phases 1-3 at Bridgewater was permitted under Reg. Ref.: 10/174; ABP Ref: PL15.238053 and subsequently amended under Reg. Refs.: 19336, 19353, 19549, 19875 and 211475. The development comprises 155 no. houses, crèche and community building, public park and all associated works and is currently under construction by the applicant and will comprise Phase 4 of the overall development.

On 24th June 2021, Louth County Council granted permission for the extension of duration of the parent permission at the site Reg. Ref.: 10/174; ABP Ref: PL15.238053 until 4th March 2027 under planning register reference 21/535. Reg. Ref: 19336 was extended until 31st December 2025 by Louth County Council on 3rd March 2022.

The proposed development overlaps with and will supersede part of the permitted development including 31 no. dwellings as well as a crèche and community building to provide a total of 396 no. dwellings at the overall development at Bridgewater. An Environmental Impact Statement was submitted with the planning application for Phases 1-3 (Reg. Ref.: 10/174; ABP Ref: PL15.238053). This EIAR assesses the proposed development within the red line boundary of the proposed development extending to c. 13.03 ha. Previous phases at Bridgewater have been taken into account in the EIAR, where relevant.

This EIAR document has been prepared in accordance with the European Union EIA Directive 85/337/EC as amended by Directives 97/11/EC, 2003/4/EC, 2011/92/EU and 2014/52/EU, as well as implementing legislation, i.e., Part X of the Planning and Development Act 2000, as amended (**'the 2000 Act'**), the Planning and Development (Housing) and Residential Tenancies Act 2016 (**'the 2016 Act'**) and Parts 10 and 23 of the Planning and Development Regulations 2001, as amended, (in particular as amended by the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018) ("the 2001 Regulations"). A description of the methodological approach to the preparation of this EIAR is provided in the following sections of this chapter.

1.1 DEFINITION OF EIA AND EIAR

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 (EIAR), and the responsibility of the competent authority to provide reasoned conclusions following the examination of the EIAR 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 new 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;

‘*proposed development*’ means proposed development within the meaning of section 172(1A)(a)’.

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 (2017)¹ provide the following definition:

“A statement of the effects, if any, which proposed development, if carried out, would have on the environment.”

The EIAR is prepared by the developer and is submitted to a CA (Competent Authority) 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 provides a systematic analysis and evaluation of the potentially significant effects of a proposed project on the receiving environment. The amended EIA Directive prescribes a range of environmental factors which are used to organise descriptions of the environment and these factors must be addressed in the EIAR.

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 that are unacceptable, the EIA process aims to quantify and minimise the impact specified 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.

1.2 EIA LEGISLATION

Certain public and private projects that are likely to have significant effects on the environment are subject to EIA requirements derived from EIA Directive 85/337/EC (as amended by Council Directive 97/11/EC, Directive 2003/4/EC, Directive 2009/31/EC, Directive 2011/92/EU and Directive 2014/52/EU, which amends the previous EIA Directives in a number of respects by amending the consolidating Directive 2011/92/EU). 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.

1.3 EIA GUIDELINES

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 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 individual consultant.

We would also note that the pre-application discussions with the Louth County Council and An Bord Pleanála informed the content/ scoping of the EIAR.

¹ *Guidelines on the Information to be contained in an Environmental Impact Assessment Report, Environmental Protection Agency, 2017*

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

Irish
<ul style="list-style-type: none"> • Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, EPA, August 2017 • 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). • Guidelines on Information to be Contained in an Environmental Impact Statement (EPA 2002).
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 • EU Guidance on EIA Screening (DG Environment 2001). • Guidance on EIA Scoping (DG Environment 2001). • EIA Review Checklist (DG Environment 2001). • Study on the Assessment of Indirect & Cumulative Impacts as well as Impact Interaction (DG Environment 2002).

The most recent guidelines are the Draft Guidelines 2017 on the Information to be Contained in Environmental Impact Assessment Reports published by the EPA in 2017.

The EPA draft guidelines have been prepared to help practitioners interpret the amended EIA Directive and are likely to be updated and finalised following the updates to the Planning and Development Act 2000 (as amended) and Planning and Development Regulations 2001 (as amended).

They provide practical guidance to planning authorities, An Bord Pleanála, and other relevant stakeholders, on procedural issues and the EIA process, and outline the key changes introduced by Directive 2014/52/EU.

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, of the 2001 Regulations, as amended by the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018.

1.4 EIA PROCESS OVERVIEW

The main purpose of the EIA process is to identify the likely significant impacts on the human environment, the natural environment and on cultural heritage associated with the proposed development, and to determine how to eliminate or minimise these impacts. The EIAR summarises the environmental information collected during the impact assessment of the proposed development.

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 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 outlines the possible alternative approaches to the proposed development. Consideration of alternative sites and layouts within the final chosen site are 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 6 to 16.

1.5 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.

Schedule 5 (Part 1) of the Planning & Development Regulations 2001 (as amended) transposes Annex 1 of the EIA Directive directly into Irish land use planning legislation. The Directive prescribes mandatory thresholds in respect to Annex 1 projects.

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.

The proposed development falls within category 10(b)(iv) and category 13(a)(ii) of Part 2 of Schedule 5 of the Planning and Development Regulations 2001, as amended:

Category 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.*'

Category 13(a)(ii) refers to '*Any change or extension of development already authorised, executed or in the process of being executed... which would: - (ii) result in an increase in size greater than 25%...*'

The gross site area is approximately 13.03 hectares and will form part of the Bridgewater development by The Ardee Partnership in Ardee. The initial phases of development are currently under construction, comprising 155 no. residential units, a crèche, community building, public park, open space, access and all associated infrastructure with Phase 1 complete and Phase 2 underway.

The proposed development meets the thresholds set out by Category 10(b)(iv) and Category 13(b)(ii) of Schedule 5 (Part 2) of the Planning & Development Regulations 2001 (as amended).

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.

1.6 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:

'determining the content and extent of the matters which should be covered in the environmental information to be submitted in the EIAR'.

The applicant is committed to ensuring that all of its development projects are conducted in a responsible and sustainable manner. A scoping process to identify the issues that are likely to be most important during the Environmental Impact Assessment process was carried out by the applicant, design team and EIAR consultants and informed the format of this EIAR.

Section 7(1)(b) of the 2016 Act, provides that a request for scoping may be submitted to the An Bord Pleanála, however this is not mandatory. The second paragraph of Article 5(2) of Directive 2014/92/EU provides that Member States can choose to make it mandatory that competent authorities have to give a scoping opinion irrespective of whether the developer so requests. The transposition of this provision is optional and the consultation paper from the Department indicates that it is not intended to introduce mandatory scoping.

The 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, Waste and Utilities;
- Archaeology, Architectural and Cultural Heritage;
- Risk Management;
- Interactions of the Foregoing;
- Mitigation and Monitoring Measures;
- Non-Technical Summary.

² Guidance on EIA Scoping, EC, 2001

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.

A series of meetings have taken place with the technical staff of Louth County Council and An Bord Pleanála which assisted in the preparation of this EIAR and the planning application.

1.7 INFORMATION TO BE CONTAINED IN AN EIAR

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;

(a) (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;

(b) (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;

(c) (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 hydro morphological 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.

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.

Article 5(1) 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 results of other such assessments, where relevant, have been considered in each of the chapters.

The likely significant effects in this EIAR are described using the terminology in the Draft EPA Guidelines 2017, 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 all 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 3.3 from EPA Guidelines:

<p>Quality of Effects</p> <p>It is important to inform the non-specialist reader whether an effect is positive, negative or neutral</p>	<p>Positive Effects</p> <p>A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).</p>
	<p>Neutral Effects</p> <p>No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.</p>
	<p>Negative/adverse Effects</p> <p>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).</p>
<p>Describing the Significance of Effects</p> <p>“Significance’ is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful (also see <i>Determining Significance</i> below.).</p>	<p>Imperceptible</p> <p>An effect capable of measurement but without significant consequences.</p>
	<p>Not significant</p> <p>An effect which causes noticeable² changes in the character of the environment but without significant consequences.</p>
	<p>Slight Effects</p> <p>An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.</p>
	<p>Moderate Effects</p> <p>An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.</p>
	<p>Significant Effects</p> <p>An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.</p>
	<p>Very Significant</p> <p>An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.</p>
	<p>Profound Effects</p> <p>An effect which obliterates sensitive characteristics</p>
<p>Describing the Extent and Context of Effects</p> <p>Context can affect the perception of significance. It is important to establish if the effect is unique or, perhaps, commonly or increasingly experienced.</p>	<p>Extent</p> <p>Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.</p>
	<p>Context</p> <p>Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)</p>

<p>Describing the Probability of Effects</p> <p>Descriptions of effects should establish how likely it is that the predicted effects will occur – so that the CA can take a view of the balance of risk over advantage when making a decision.</p>	<p>Likely Effects</p> <p>The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.</p> <p>Unlikely Effects</p> <p>The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.</p>
<p>Describing the Duration and Frequency of Effects</p> <p>‘Duration’ is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful.</p>	<p>Momentary Effects</p> <p>Effects lasting from seconds to minutes</p>
	<p>Brief Effects</p> <p>Effects lasting less than a day</p>
	<p>Temporary Effects</p> <p>Effects lasting less than a year</p>
	<p>Short-term Effects</p> <p>Effects lasting one to seven years.</p>
	<p>Medium-term Effects</p> <p>Effects lasting seven to fifteen years.</p>
	<p>Long-term Effects</p> <p>Effects lasting fifteen to sixty years.</p>
	<p>Permanent Effects</p> <p>Effects lasting over sixty years</p>
	<p>Reversible Effects</p> <p>Effects that can be undone, for example through remediation or restoration</p>
	<p>Frequency of Effects</p> <p>Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)</p>

Describing the Types of Effects	Indirect Effects (a.k.a. Secondary Effects) Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
	Cumulative Effects The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.
	'Do-Nothing Effects' The environment as it would be in the future should the subject project not be carried out.
	'Worst case' Effects The effects arising from a project in the case where mitigation measures substantially fail.
	Indeterminable Effects When the full consequences of a change in the environment cannot be described.
	Irreversible Effects When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
	Residual Effects The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic Effects Where the resultant effect is of greater significance than the sum of its constituents, (e.g. combination of SO _x and NO _x to produce smog).

1.8 PURPOSE OF THIS EIAR

The EPA Guidelines state that the main purpose of an EIAR *'is to identify, describe and present an assessment of the likely significant impacts 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:

- *'Impacts that are both likely and significant;*
- *Impact descriptions 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 An Bord Pleanála, Louth County Council, statutory consultees and the public in assessing all aspects of the application proposals.

1.9 OBJECTIVES OF THIS EIAR

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

- Anticipating, 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 assessment process of the prescribed environmental factors in relation to the proposed development at Bridgewater, Ardee, County Louth.

1.9.1 Anticipating, Avoiding and Mitigating Significant Effects

The anticipation of effects is the most effective means of avoiding adverse effects at the earliest stages of a project. An assessment of anticipated likely and significant impacts was undertaken during the screening, informal scoping and the considerations of alternatives stages of the EIA process. This

involved forming a preliminary opinion, in the absence of complete data, with respect to the approximate magnitude and character of the likely environmental impacts. This assessment was based on the knowledge, experience and expertise of the EIA and project design team with reference to the amended EIA Directive, EIA guidance material and local precedents.

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.

1.9.2 Maintain Environmental Scope and Focus

It is important that the EIAR document remains tightly focussed. This minimises expenses, delays and the potential for a confusing mass of data to obscure relevant facts. The EIA process has been project managed and steered, to ensure that the EIAR documentation and analysis are confined to those topics and issues which are explicitly described in the legislation, and where environmental impacts may arise. Evaluation and analysis have been limited to topics where the indirect, secondary or cumulative impacts are either wholly or dominantly due to the project or development under consideration and remain focused on issues that:

- Are environmentally based;
- Are likely to occur; and,
- Have significant and adverse effects.

1.9.3 Informing the Decision

The EIAR document enables An Bord Pleanála, 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.

1.9.4 Public & Stakeholder Participation

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.

Public participation and consultation are an integral part of the Strategic Housing Development process as outlined in 2016 Act and the Planning and Development (Strategic Housing Development) Regulations 2017, which amend the 2001 Regulations to include provisions relating to Strategic Housing Development.

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 the likely environmental impacts of projects prior to the granting of consent.

Informal scoping of potential environmental impacts was undertaken with the Planning Authority and An Bord Pleanála through pre-application meetings. Direct and formal public participation in the EIA process will be through the statutory planning application process.

1.10 FORMAT AND STRUCTURE OF THIS EIAR

1.10.1 EIAR Structure

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 (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 includes an assessment of the potential cumulative impacts with other existing and planned developments. Environmental aspects considered include:

Chapter 1	Introduction & Methodology
Chapter 2	Project Description & Alternatives Considered
Chapter 3	Population and Human Health
Chapter 4	Biodiversity
Chapter 5	Land and Soils
Chapter 6	Water
Chapter 7	Air Quality & Climate
Chapter 8	Noise & Vibration
Chapter 9	Landscape & Visual Impact
Chapter 10	Material Assets – Traffic
Chapter 11	Material Assets - Waste Management
Chapter 12	Material Assets - Utilities
Chapter 13	Cultural Heritage & Archaeology
Chapter 14	Risk Management for Major Accidents and/or Disasters
Chapter 15	Interactions of the Forgoing
Chapter 16	Summary of EIA Mitigation and Monitoring Measures
Chapter 17	References

- Volume III: Technical Appendices (Volume III contains specialists' technical data and other related reports).

1.10.2 EIAR Volume II Structure

The preparation of an EIAR 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 EIAR document.

The structure used in this EIAR document is a Grouped Format structure. This structure examines each environmental topic³ in a separate chapter of this EIAR document. The structure of the EIAR document is set out in Table 1.2 below.

Table 1.2 – Structure of this EIAR

Chapter	Title	Content
1	Introduction and Methodology	Sets out the purpose, methodology and scope of the document.
2	Project Description and Alternatives Considered	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 In some instances similar environmental topics are grouped.

Chapter	Title	Content
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.
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 recommends mitigation measures.
6	Water	Provides an overview of the baseline position, the potential impact of the proposed development on water quality and quantity and recommends mitigation measures.
7	Air Quality and Climate	Provides an overview of the baseline air quality and climatic environment, the potential impact of the proposed development, the vulnerability of the project to climate change, and recommends mitigation measures.
8	Noise and Vibration	Provides an overview of the baseline noise environment, the potential impact of the proposed development and recommends mitigation measures.
9	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 recommends mitigation measures.
10-12	Material Assets	Describes the existing traffic, waste management and services and utilities of the proposed development and the likely impact of the proposed development on material assets.
13	Cultural Heritage & Archaeology	Provides an assessment of the site and considers the potential impact of the proposed development on the local archaeology, architectural and cultural heritage; and recommends mitigation measures.
14	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.
15	Interactions of the Foregoing	Describes the potential interactions and interrelationships between the various environmental factors
16	Summary of Mitigation and Monitoring Measures	Sets out the key mitigation and monitoring measures included in the EIAR Document for ease of reference.
17	Reference List	List of references within the chapters of the EIAR

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 1.3 – Methodology Employed to Evaluate Environmental Topic

- **Introduction:** Provides an overview of the specialist area and specifies the specialist who prepared the assessment.
- **Study Methodology:** This subsection outlines the method by which the relevant impact assessment has been conducted within that chapter.
- **The Existing Receiving Environment (Baseline Situation):** In describing the receiving environment, the **context, character, significance and sensitivity** of the baseline receiving environment into which the proposed development will fit is assessed. This also takes account of any proposed developments that are likely to proceed.
- **Characteristics of the Proposed Development:** Consideration of the 'Characteristics of the Proposed Development' allows for a projection of the 'level of impact' on any aspect of the proposed environment that could arise. For each chapter those characteristics of the proposed development which are relevant to the area of study are described; for example, the chapter on landscape and visual impact addresses issues such as height and impact on the surrounding landscape.
- The characteristics of projects must be considered, with particular regard to: (a) the size and design of the whole project; (b) cumulation with other existing and/or approved projects; (c) the use of natural resources, in particular land, soil, water and biodiversity; (d) the production of waste; (e) pollution and nuisances; (f) the risk of major accidents and/or disasters which are relevant to the project concerned, including those caused by climate change, in accordance with scientific knowledge; (g) the risks to human health (for example due to water contamination or air pollution).
- **Potential Impact of the Proposed Development:** This section provides a description of the specific, direct and indirect impacts that the proposed development may have. This is provided with reference to both the Receiving Environment and Characteristics of the Proposed Development sections while also referring to the (i) magnitude and intensity, (ii) integrity, (iii) duration and (iv) probability of impacts. Impact assessment addresses direct, indirect, secondary, cumulative, transboundary, short, medium and long-term, permanent, temporary, positive and negative effects as well as impact interactions.
- **Do Nothing Scenario:** 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.
- **Avoidance, Remedial and Mitigation Measures: Avoidance,** remedial and mitigation measures describe any corrective or mitigative measures that are either practicable or reasonable, having regard to the potential impacts. This includes avoidance, reduction and remedy measures as set out in Section 4.7 of the Development Management Guidelines 2007 to reduce or eliminate any significant adverse impacts identified.
- **Predicted Impacts of the Proposed Development:** This section allows for a qualitative description of the resultant specific direct, indirect, secondary, cumulative, transboundary, 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.

- **Monitoring:** This involves a description of monitoring in a post-development phase, if required. This section addresses the effects that require monitoring, along with the methods and the agencies that are responsible for such monitoring.
- **Reinstatement:** While not applicable to every aspect of the environment considered within the EIAR, certain measures need to be proposed to ensure that in the event of the proposal being discontinued, there will be minimal impact to the environment.
- **Interactions:** This section provides a description of impact interactions together with potential indirect, secondary and cumulative impacts
- **Difficulties Encountered in Compiling:** This section provides an indication of any difficulties encountered by the environmental specialist in compiling the required information.

1.11 EIAR PROJECT TEAM

1.11.1 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.

1.11.2 EIAR Competent Experts/Environmental Specialists

Environmental specialist consultants were also commissioned for the various technical chapters of the EIAR document which are mandatorily required as per the EIA Directive and Planning and Development Regulations 2018.

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'.

In order to outline compliance with this requirement of the amended directive and in line with emerging best practice the EIAR states the names of the environmental consultants who have prepared each element of the EIAR and lists their qualifications and relevant experience; demonstrating that the EIAR has been prepared by competent experts.

Each environmental specialist 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.

In accordance with the EIA Directive 2014/52/EU, we confirm that the EIAR has been carried out by fully qualified and competent experts in their relevant fields as outlined in this chapter. Further, each expert has been made aware of and are vigilant to the possibility of accumulation of effects.

The relevant specialist consultants who contributed to the EIAR and their inputs are set out in Table 1.4 below.

Table 1.4 – EIAR List of Competent Experts

Organisation	EIAR Specialist Topics / Inputs
John Spain Associates, Planning & Development Consultants, Ian Livingstone, MA Honours, MSc., MRTPI 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 Summary of EIA Mitigation and Monitoring Measures Non-Technical Summary
Darmody Architecture Jennifer Lynch - Dip.Arch B.Arch.Sc (MRIAI) Sean Barrett - BSc. Arch, Prof. Dip. Arch, BSC Arch Tech	Project Description & Alternatives Considered
Altemar Bryan Deegan – MCIEEM, M.Sc. Environmental Science, BSc (Hons.) in Applied Marine Biology; National Diploma in Applied Aquatic Science Wildlife Surveys Ireland Bran Keeley – BSC (Hons) Zoology Charles McCorkell – BSc. (Hons) Agriculture, MICF, LANTRA	Biodiversity
CS Consulting Engineers Robert Fitzmaurice – BA Civil & Environmental Engineering, Dip. Environmental Engineering, Advanced Dip. Planning & Environmental Law	Land and Soils/ Water
CS Consulting Engineers Gordon Finn – BA/BAI & MAI Civil, Structural, and Environmental Engineering, MIEI	Material Assets - Traffic
AWN Consulting Chonaill Bradley - BSc in Environmental Science, Associate CIWN	Material Assets - Waste Management
AWN Consulting Emma Cross – BA Natural Science, MSc. Environmental Sustainability	Material Assets (Utilities)
AWN Consulting Ciara Nolan – MSc. Environmental Science, BSc. Energy Systems Engineering	Air Quality and Climate
AWN Consulting Dermot Blunnie – BEng (Hons) Sound Engineering, MSc. Applied Acoustics, Dip. Acoustics & Noise Control, MMIEI, MIOA	Noise and Vibration

Organisation	EIAR Specialist Topics / Inputs
Stephen Diamond Associates Harry Osbourne – MILI, CMLI	Landscape and Visual Impacts
ACSU Donald Murphy – MA, MIAI Magda Lyne - MA, MIAI	Cultural Heritage & Archaeology
Arkmount Dualta Conway – H.Dip. Occupational Health and Safety, Grad. IOSH	Risk Management

1.12 NON-TECHNICAL SUMMARY

The EIA Directive requires that one of the objectives of the EIA process is to ensure that the public are fully aware of the environmental implications of any decisions.

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

The 2018 EIA Guidelines 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 been prepared which summarises the key environmental impacts and is provided as a separately bound document in Volume I.

1.13 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 likely implications for the site in view of the site's conservation objectives.

In January 2010 the Department of the Environment, Heritage and Local Government 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.

The Department of the Environment, Heritage and Local Government are introducing further legislation on this issue of Appropriate Assessment. The Department advises that all projects are screened for Appropriate Assessment.

An Appropriate Assessment and Natura Impact Statement screening was undertaken by Altermar 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*’. The AA Screening and NIS is submitted with the planning application.

1.14 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 An Bord Pleanála and the Planning Authority (Louth County Council) at a fee not exceeding the reasonable cost of reproducing the document. A copy of the planning application including the EIAR can also be viewed at www.bridgewaterhd.ie

1.15 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.

It should be noted that, as highlighted above, an important part of the EIA process is preventative action which causes the project design team to devise measures to avoid, reduce or remedy significant adverse impacts in advance of applying for consent. As a result, where no likely significant impacts have been identified where they might reasonably be anticipated to occur, the design and layout of the proposed development has generally been amended to minimise the potential of any likely significant adverse impacts.

1.16 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.

1.17 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 Report⁴ and the Department of Housing, Planning, Community and Local Government have published a consultation paper⁵, 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.

1.18 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.

⁴ *Guidelines on the Information to be contained in an Environmental Impact Assessment Report, Environmental Protection Agency, 2017*

⁵ *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 PROPOSED DEVELOPMENT AND ALTERNATIVES EXAMINED

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 Ian Livingstone MA Honours, MSc. MRTPI, Associate Director with John Spain Associates, and reviewed by Rory Kunz, BA (MOD), MScERM, MAT&CP, Dip EIA Mgmt., Executive Director with John Spain Associates. Inputs to this chapter have also been provided by CS Consulting Engineers (Drainage and Traffic), MandE Consulting Engineers (Energy, Utilities & Lighting), Darmody Architecture (Alternatives Examined), JBA Consulting (Flood Risk).

Figure 2.1 – Applicant Land Ownership (in blue) at Bridgegate, Ardee (indicative subject site in red)

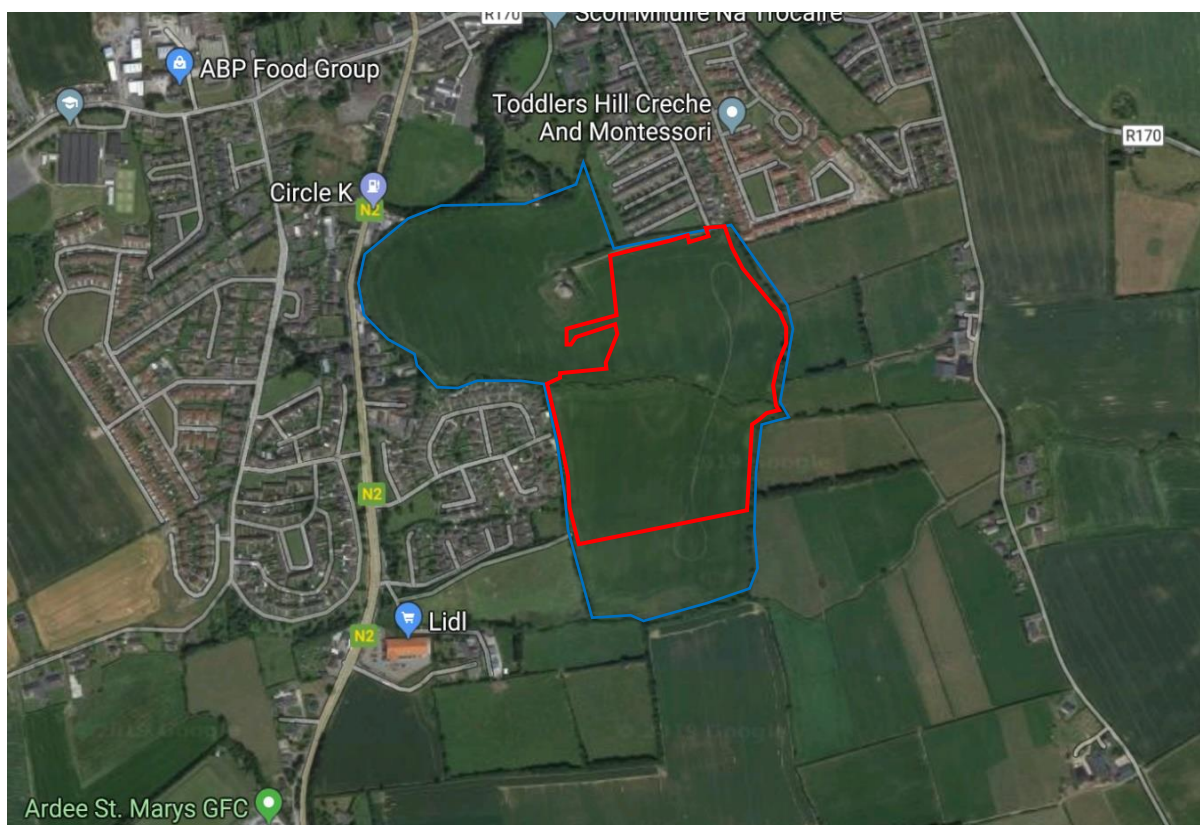


Figure 2.2 – Overall Bridgewater Development including Proposed Development



Source: Darmody Architecture

The proposed development comprises the extension of the Bridgewater development effectively forming 'Phase 4' of the residential area and benefitting from the permitted scheme adjoining to the west by way of roads and drainage infrastructure. The proposal overlaps and will supersede and replace a section of the permitted development in the western area of the site and will enhance the Rathgory Tributary through the creation of an open watercourse and riparian corridor providing a valuable area of amenity and biodiversity for the wider development at Bridgewater. The proposal comprises 272 no. dwellings of various type and scale, as well as community facilities in the form of a community building and crèche and a c. 3.6 ha public park in the northern part of the site which will integrate with the permitted park adjacent to the west. The proposal will implement a sustainable extension to the settlement of Ardee and facilitate potential future links to adjoining lands.

2.2 DESCRIPTION OF THE LOCATION OF THE PROPOSED DEVELOPMENT

The development will consist of the Phase 4 of the residential development at Bridgewater, Rathgory & Mulladrillen, Drogheda Road, Ardee, County Louth extending to c. 13.03 ha which adjoins Phases 1-3 of development on lands to the west, accessed from the N2 Drogheda Road as follows:

The development will consist of:

- A) The construction of 272 no. residential units comprising a mix of 206 no. 2, 3 and 4 bedroom houses (all 2 storeys) including 50 no. 2-bedroom houses (Type 1), 145 no. 3-bedroom houses (Types 2, 3, 6) and 11 no. 4-bedroom houses (Types 4, 5) all with private open space and car parking, alongside 66 no. duplex units (all 3 storeys) including 17 no. 1-bedroom units (Types D5, D8), 24 no. 2-bedroom units (Types D1, D3, D6) and 25 no. 3-bedroom units (Types D2, D4, D7), all with private open space in the form of terrace at upper floor level and external garden space, with 499 sqm of communal open space north of Duplex Blocks A-D (48 no.

- units) (served by 2 no. bin and bike stores [each c. 51 sqm] adjacent) at Bridgewater Avenue, providing a total residential gross floor area of c. 28,168.9 sqm;
- B) A part 1, part 2 no. storey crèche (c. 484.1 sqm) and playground and a single storey community building (c. 165 sqm) located adjacent at a central community hub (with bin and bike store [c. 23 sqm]) accessed from Bridgewater Avenue served by car parking located on Bridgewater Green and Bridgewater Avenue;
 - C) A landscaped Public Park located in the northern part of the site extending to c. 3.6 ha accessed from the community hub and between duplex Blocks B & C at Bridgewater Avenue, with 2 no. pedestrian links to permitted public park adjoining to the west and 1 no. pedestrian footpath extending to the northern perimeter at Hale Street, with a reservation for a future link road to lands to the east facilitated in the northern section of the park;
 - D) Works to the Rathgory Tributary located to the south of Bridgewater Avenue comprising the realignment of the channel and regrading and reprofiling of land (as required), implementation of 2 no. vehicular crossings (including culverts and mammal passes) and the provision of a riparian corridor based around the open watercourse comprising landscaping and planting with safe access to the watercourse provided for maintenance purposes and 1 no. pedestrian and cyclist crossing;
 - E) A series of landscaped public open spaces provided throughout the site with Public Open Space 01 (c. 1.05 ha) and Public Open Space 2 (c. 0.43 ha) located within the linear park (including riparian corridor) adjacent to the Rathgory Tributary with Public Open Space 03 (c. 0.29 ha) centrally located in the southern part of the site; open spaces will provide a mix of hard and soft landscaping, pedestrian and cycle access (cycle lanes provided at POS 1 and POS 2) and a range of activities including fitness spaces, kickabout area, amphitheatre and nature based play areas;
 - F) Provision of shared surfaces, landscaped streetscapes including planting and landscaping at two neighbourhood streets in the southern part of the site, with roads provided to site boundaries to the east, south and west to facilitate possible future connections;
 - G) All landscaping including planting to consolidate treelines and hedgerows forming existing site boundaries with agricultural lands to the east and Cherrybrook residential development to the west and all boundary treatments;
 - H) Roads and access infrastructure taken from Bridgewater Avenue (permitted under Reg. Ref.: 10/174; ABP Ref: PL15.238053 [as amended]), the provision of a bus stop on the south side of Bridgewater Avenue adjacent to community hub and provision of cycle lanes at this location (continued through Public Open Space 01); a total of 480 no. car parking spaces (362 no. serving houses, 84 no. serving duplexes, 23 no. serving crèche and community building and 11 no. visitor and public open spaces), a total of 296 no. bicycle parking spaces (186 no. spaces serving duplexes [80 visitor spaces], 32 no. spaces at the community hub and 60 no. visitor spaces);
 - I) Provision of 2 no. ESB substations, all associated drainage and services infrastructure (surface water, foul and water supply), public lighting, SUDS drainage and works to facilitate the development.

The proposals overlap the boundary of permitted development Reg. Ref.: 10174; ABP Ref: PL15.238053 (as amended) at the western boundary and will supersede granted development in this area which consists of 31 no. dwellings, crèche and community building and public open space.

The proposed development is located on 'A2 New Residential Phase 1' lands to '*provide for new residential neighbourhoods and support community facilities*'. Accompanying text states that A2 zoned land '*is the primary location for new residential neighbourhoods*' and development should be of high-quality design and layout, appropriate mix and sustainable transport links whilst density should be reflective of the location with high densities at more central locations.

2.3 DESCRIPTION OF THE PHYSICAL CHARACTERISTICS OF THE PROJECT

This section is based on information provided by Darmody Architecture. Please refer to the accompanying architectural drawings and Design Statement for further information. This Strategic Housing Development (SHD) application relates to the provision of 272 no. residential dwellings, community building and crèche at a centralised location in the northern part of the site, a public park extending to c. 3.62 ha interconnecting with park to the west permitted under the parent permission at the site (Reg. Ref.: 10174; ABP Ref: PL15.238053), a total of c. 1.8 ha of public open space and all roads and services infrastructure to facilitate development. The Public Park is provided in accordance with ‘Spot Objective 4’ of the Louth County Development Plan 2021-2027 which requires the provision of a 12-acre (4.9 ha) park. This is achieved by the proposed park in combination with the permitted park to the west, equating to a c. 7.2 ha or c. 17.8 acres, considerably in excess of the zoning objective.

A riparian corridor is proposed which will border the realigned open watercourse of the Rathgory Tributary. The proposed development comprises works to realign the watercourse to achieve a more efficient site layout and provide an enhanced element of ecological and recreational benefit to the proposed development and the wider settlement of Ardee.

The development will be accessed from the N2 Drogheda Road and via Bridgewater Avenue at the site’s western boundary. Bridgewater Avenue constructed as part of planning permission Reg. Ref.: 10174 as amended will be extended to meet the eastern site boundary with the internal network crossing the Rathgory Tributary south to serve the residential units at this location. Roads will be extended to site boundaries to facilitate connections to adjoining lands.

The proposal overlaps slightly with the area of the extant permission and will supersede granted development in this area. This will result in a total combined number of 396 no. units at the overall Bridgewater development, including the proposed development and the permitted units at phases 1-3.

The application site extends to c. 13.03 hectares and The EIAR assesses the development proposed within the red line boundary (see figure 2.1) to the east of the extant permission at Bridgewater as well as cumulative development of phases 1-3.

2.3.1 Demolition

There is no demolition of habitable or any other structures relating to the proposed development which is located on a greenfield site.

2.3.2 Residential Dwellings

The site area is approximately 13.03 hectares, including all roads, landscaping and public open space works. The proposal includes a single storey community building of c. 165 sqm and a crèche of c. 484 sqm, which has been designed to be of sufficient scale to cater for the overall development at Bridgewater (396 no. units).

Table 2.1 – Proposed Residential Mix

Proposed Units	1 bed	2 bed	3 bed	4 bed	5 bed	Overall	Percentage of Total
Duplex Apartments	17	24	25	0	0	66	24.3%
Houses	0	50	145	11	0	206	75.7%
Overall Total	17	74	170	11	0	272	
Percentage of Total	6.3%	27.2%	62.5%	4%	0%	100%	

Source: Darmody Architecture

Figure 2.3 – Main Development Site



Source: Darmody Architecture

2.3.2.1 Houses

The 206 no. houses proposed are located in the southern part of the site and south of the Rathgroy Tributary. Houses are provided at a mix of 50 no. 2-bed, 145 no. 3-bed and 11 no. 4-bed units. All houses are 2 no. storeys with private amenity space in the form of a rear garden. Access to the rear of houses sited back-to-back allows the manoeuvre of bins to kerbside collection points. Dual frontage units are provided at corner locations to ensure active frontage and passive surveillance with all dwellings dual aspect. Dwellings are provided as a combined of semi-detached and terraced units. Individual plot layouts provide good separation to ensure privacy and minimise overlooking both within the proposed development and to the west at Cherrybrook.

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 contribute to the specific character of the development, both overall and in each street. The overall provision of 6 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 2.4 – CGI of Residential Dwellings and Central Park



Source: Modelworks

2.3.2.2 Duplexes

The proposed development includes a total of 66 no. duplex units, comprising 17 no. 1-bedroom, 24 no. 2-bedroom and 25 no. 3-bedroom units. All duplexes are provided in 3 storey buildings, with 4 no. duplex blocks located to the north of Bridgeway Avenue at the base of Mulladrillen Hill, providing 48 no. units at this location. The remaining balance of 18 no. duplexes are distributed evenly throughout the southern part of the site marking corner locations, entrances to shared zones and contributing to legibility.

The 18 no. duplex units in southern part of the site benefit from private open space by way of rear garden serving the ground floor unit and private external terrace serving the upper units. South facing terraces are provided at upper level within the 68 no. units at Blocks A-D, with external terraces to the north and south of ground floor units. A total of 499 sqm of external communal space provided to the north of these units within 2 no. landscaped areas with seating and informal recreation. Shared bicycle and bin stores are located centrally between Blocks A and B and Blocks C and D, with a route to the public park to the north located between Blocks B and C. A total of 8 duplex house types are provided.

Figure 2.5 –CGI of Duplex Unit at Neighbourhood Street



Source: Modelworks

2.3.3 Community Hub

The entrance to the proposed development from Bridgewater Avenue is characterised by community uses in the form of a crèche and community building located centrally to the overall development. The buildings are sited alongside one another accessed from Bridgewater Avenue, with 23 no. car parking spaces serving the community uses on Bridgewater Avenue and Bridgewater Green. An additional 11 no. car parking spaces are provided for visitor and public park use.

The single storey community building extends to c. 165 sqm and is located to the west of the part 1 no. part 2 no. storey crèche building which provides a playground (c. 152 sqm) extending from the northern elevation. The main gateway to the public park to the north is located between the crèche and Duplex Block A to the east. The crèche building extends to c. 484 sqm and has been designed to cater for the overall development at Bridgewater, inclusive of Phases 1-3 which are currently under construction to the west, with space for 100 children.

The proposed community hub will supersede the crèche and community building permitted under Reg. Ref.: 19336 (amending parent permission 10174) at the location with the crèche building enlarged to cater for the overall Bridgewater development comprising 396 no. units including the proposed development at Phase 4.

Both buildings are finished in high quality materials with pre-coloured render finish, blue/black roof tiles, PVC fenestration and clad framed windows with metal canopies over entrances and generous elements of glazing to maximise natural light access.

2.3.4 Character Areas

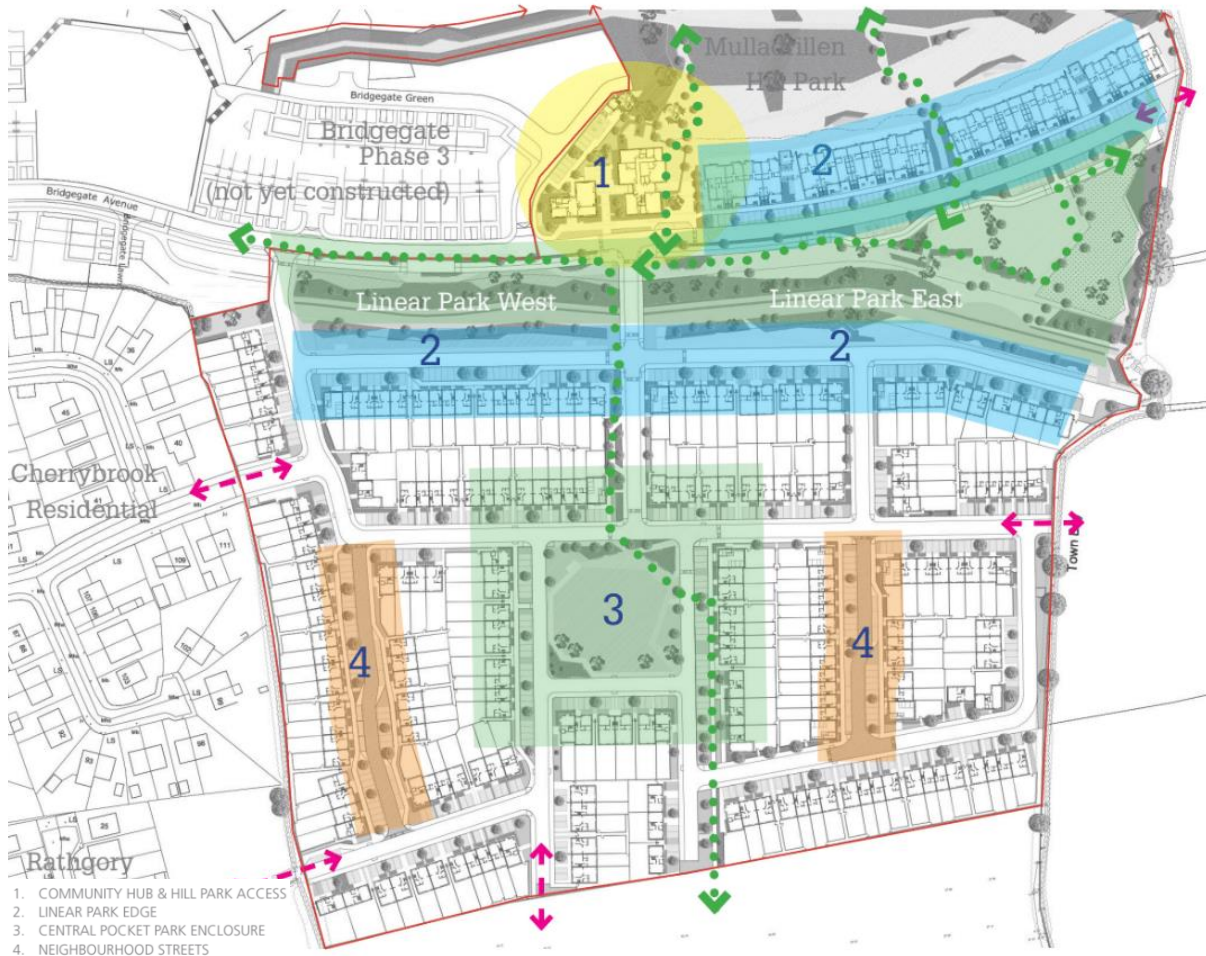
As set out in the Darmody Architecture Design Statement, (extract below) character areas are primarily defined by the community land use and areas of open space and its edge around the riparian corridor at the Rathgory Tributary. Character areas in the southern part of the site are informed by the central area of open space and shared neighbourhood streets.

Character Areas are noted as follows:

1. Community Hub & Hill Park Access
2. Linear Park Edge
3. Central Pocket Park
4. Neighbourhood Streets

The Darmody Architecture Design Statement notes that the creation of new character areas are an essential quality of the new urban form within the proposed development. It is considered that the scheme delivers a coherent urban network of streets and public realm spaces that respond to the existing context in terms of height, scale, uses and open space to integrate appropriately and provide continuity to the permitted initial phases of development at Bridgewater. A green riparian corridor and public open space along the Rathgory Tributary characterises the area south of the community hub and Bridgewater Avenue, with generous provision of open space throughout the site complementing the public park which occupies the northern part of the site.

Figure 2.6 – Character Areas



Source: Darmody Architecture

2.3.4.1 Community Hub & Hill Park Access

The entrance to the proposed development from Bridgegate Avenue is characterised by community use complemented by aspects of the linear park and riparian corridor to the south around Rathgory Tributary. This character area encompasses the crèche and community building as well as the landscaped, gateway access to the public park to the north, acting as a distinct transition zone moving east past the permitted semi-detached 2 storey dwellings to the west and the 3 no. duplex blocks to the east.

As noted within the Darmody Architecture Design Statement, the buildings have been designed collectively to form an attractive entrance courtyard off the public street using similar materials and design language. The prominent south façades of the buildings provide passive surveillance to the Hill Park gateway to the east and the public open space to the south. The tall gabled east façade of the crèche encloses a hard landscaped space with the west façade of the duplex terrace, acting as a 'landing zone'.

The buildings align with the lines permitted to the west and addresses the primary north-south vehicular axis that traverses the linear park opposite. The hub provides an element of legibility to the scheme and a focal point from which to access the public park to the north.

Figure 2.7 – ‘Landing Zone’ CGI



Source: Modelworks

2.3.4.2 Linear Park Edge

The character of this area is defined by the riparian corridor which is the central point of the linear park (comprising Public Open Space 01 and 02) based around the realigned Rathgory Tributary. The character area consists of two linear areas to the north and south of the watercourse and includes the 48 no. duplex units to the north and the dwellings overlooking the linear park to the south. The linear park and riparian corridor optimises the open watercourse and provides a generous area of public open space comprising hard and soft landscaping and range of passive and active recreation.

The landscaping is fully integrated with the sustainable drainage strategy for the site (discussed in greater detail later in the chapter) and provides a distinction from the community hub and 3 storey duplex blocks to the north and the prevalent 2 storey dwellings to the south. In the north, Bridgewater Avenue is extended to the eastern perimeter of the site with open agricultural lands adjacent, with a turning head at this location.

The duplex blocks provide an element of increased density against the backdrop of the elevated Mulladrillen Hill. The street is characterised by a mix of interspersed car parking with landscaping. Bicycle lanes are included adjacent to the south. Bicycle and bin stores are located centrally between Blocks A and B and Blocks C and D, with a secondary entrance to the public park located between Blocks B and C. Dual frontage house types animate the entrances to the public park at the western block as well as centrally and also bookend Block D. Private patio areas enclosed by low level hedging characterise the southern elevations of the ground floor duplex blocks, activating the streetscape. Brick clad projecting two storey duplex bays also add depth & texture to the elevations. Glazing is optimised at the southern elevations to enhance natural light capture and enjoy aspects across the linear park.

To the south of the linear park there are 3 no. groups of terraces of 2 storey houses with 3 storey dual frontage end of terraces that address the edge of the park with neighbourhood streets.

Figure 2.8 – Linear Park Edge at Bridgeway Avenue



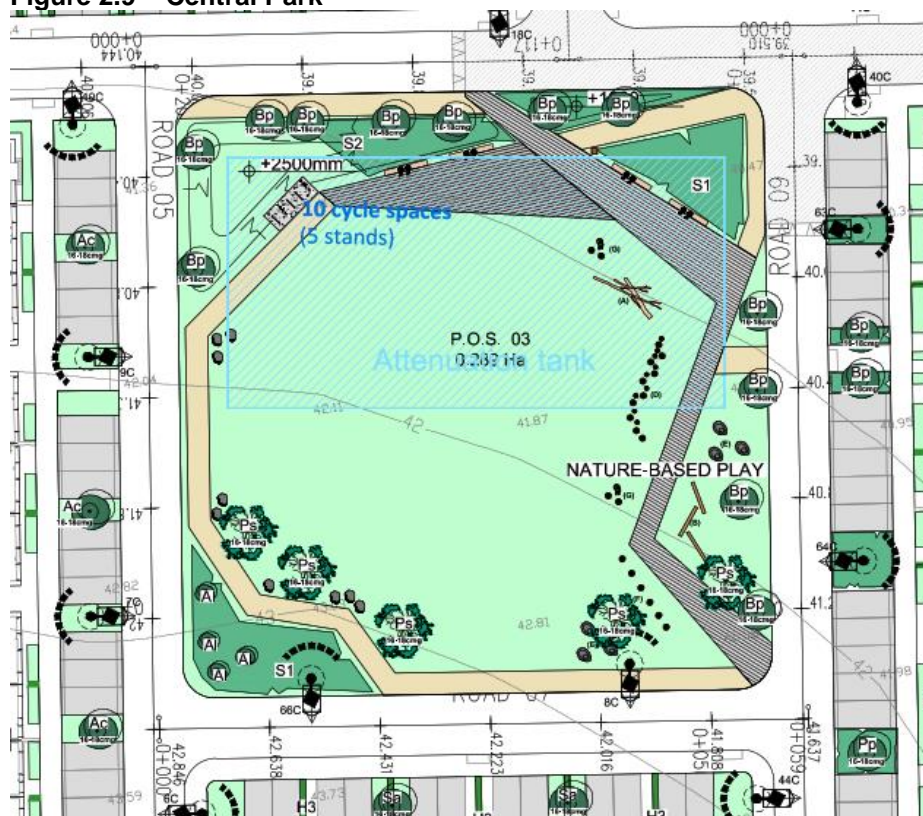
Source: Modelworks

2.3.4.3 Central Pocket Park Enclosure

The third character area is defined by Public Open Space 03, extending to c. 0.29ha, located centrally within the south part of the development and surrounded on 4 sides by dwellings enjoying views across this area. The park has been strategically located to be within 150m of all dwellings south of the linear park. The north-eastern edge of the park is characterised by 2 no. 3 storey duplex units, with a mix of 2 storey dwellings providing variety in visual appearance adjacent to the area.

The eastern edge of the park is characterised by a tree lined route and shared surface which encourages low speeds and promotes walking and cycling. This forms part of a green corridor which links the 3 no. areas of public open space and extends to meet the southern perimeter. The central park is characterised by a large area of public green space alongside a nature based play area, seating areas and passive recreation with tree-lined edges providing a sense of place and enclosure whilst benefitting from passive surveillance from adjacent dwellings.

Figure 2.9 – Central Park



Source: Stephen Diamond Associates

2.3.4.4 Neighbourhood Streets

The development includes 2 no. areas of neighbourhood streets located within the southern part of the site. This concept provides residential streets which the road space is shared between motor vehicles and other users. Neighbourhood streets are located at the most westerly north-south link road, the and the adjacent parallel street to the east of the central park.

Neighbourhood streets prioritise people over vehicular movements, are consistent with the principles of DMURS and are characterised by surface finishes distinct to standard roads, making drivers aware of the change in environment. The areas are considered by Darmody Architecture to be more enclosed small scale urban spaces that are defined by 2/3 bedroom terraced and semi-detached housing row, providing a mix of wide and narrow plots with a continuous 2 storey eave and roofline to ensure visual continuity, with each zone presenting an individual character.

Street materials and layout will encourage a neighbourhood street type character with the public open spaces within easy walking distance encouraging permeability and movement between the surrounding residential areas. Streets are of generous widths consistent with DMURS with wide footpaths and a mix of parallel and perpendicular parking arrangements, providing shared surfaces and active use by cyclists and pedestrians.

2.3.5 Car Parking and Cycle Parking Provision

Car parking will be provided as follows, detailed further in the Traffic & Transport Assessment prepared by CS Consulting. Proposed car parking levels has been informed by the Louth County Development Plan 2021-2027.

- One (1) car parking space to each two-bedroom house;
- Two (2) car parking spaces to each three and four-bedroom house;
- One (1) car parking space for one-bedroom duplex units;
- 1.2 car parking spaces for two-bedroom duplex units;

- 1.5 car parking spaces for three-bedroom duplex units;
- 17 no. car parking spaces for the crèche;
- 6 no. car parking spaces for the community building; and
- 5 no. car parking spaces for the public park.

Resident parking will be provided in the form of curtilage and on-street 90-degree angled and parallel parking with community and public parking provided by perpendicular and parallel parking adjacent to the community hub.

Table 2.2 – Car Parking Schedule

CAR PARKING SCHEDULE	Number / Size	Car Parking
Duplex Units	66 no.	84
Houses	206 no.	362
Crèche	483 sqm	17
Community Building	165 sqm	6
Public Park & Visitor	3.6 ha	11
Total		480 spaces

Source: CS Consulting TTA

A total of 446 no. car parking spaces are provided for the residential element of the development equating to 1.64 spaces per unit. As noted in the accompanying Traffic & Transport Assessment prepared by CS Consulting, parking has been allocated to dwellings based on the dwelling type and number of bedrooms. 2-bed houses have been allocated 1no. space while 3-bed and 4-bed houses have been allocated 2no. spaces. Parking for 1-bed duplex units has been provided at a rate of 1 no. space per unit while parking for 2-bed and 3-bed duplex units has been provided at a rate of 1.2 no. and 1.5 no. spaces per unit respectively.

The development also includes a bus stop on Bridgegate Avenue which can be utilised by a local service, with bicycle lanes also provided. A total of 23 no. spaces are located at the community hub, with 11 no. spaces provided for visitors / users of the public park. It is noted that 112 accessible spaces are provided.

Short and long stay bicycle parking is provided at the community building and crèche in the form of Sheffield stands, comprising 32 spaces. The 66 no. duplex units are served by 204 no. spaces (88 no. within bike stores) with 60 visitor spaces (Sheffield stands) adjacent to the duplex units and the open spaces throughout the site, with rear gardens and internal storage provided at Duplex D7 and D8 units types. An additional 60 visitor bicycle parking spaces are provided throughout the site for public use and those accessing the public open space and park. This provides a total of 296 no. spaces proposed for duplex apartments and community uses, with additional 412 spaces provided on curtilage for long and short stay. This is significantly in excess of the development plan standard and increased significantly from the 178 spaces proposed at pre-application stage.

Table 2.3 – Bicycle Parking Schedule

BICYCLE PARKING SCHEDULE	Number / Size	Bike Parking
Houses	206	Rear Gardens (412)
Duplex Units	66 no.	204

Crèche	476 sqm	12
Community Building	165 sqm	20
Public Park & Visitor	3.6 ha	60
Total		296 (708) spaces

Source: CS Consulting TTA

In the case of the houses within the development, ample space for the secure storage of bicycles shall be available within the curtilage of each dwelling; this is considered to satisfy the bicycle parking development plan requirements.

2.4 LANDSCAPING

2.4.1 Introduction

This section is based on information provided by Stephen Diamond Landscape Architecture. Please refer to accompanying landscape drawings and Design Report for further details. The design approach to the landscape architectural proposal is site-generated, with careful consideration given to the site's history, geology, ecology, microclimate, landscape and its context. Emphasis was placed on creativity and rigorous conceptual development in our search for robust design proposals, developed to imbue the site with distinct character.

The landscape design concept was developed from the site's existing levels and proposed road levels to site.

The landscape design is intended to create and reinforce qualities and characteristics in the open spaces enjoyed in nature such as change, surprise, awareness of transition and movement; weather, seasonal change, use and maturing. Pockets of nature are created within the hard-landscaped open spaces of the development, which are surfaced in durable attractive and hard-wearing materials to give the external spaces textural character.

As noted within the accompanying Stephen Diamond Associates Landscape Report, landscape proposals for the site are intended to contribute towards:

- A unique sense of place;
- A site-specific design proposal generated from existing landscape elements and context;
- A high-quality environment;
- A permeable layout that assists ease of movement for pedestrians and vehicular traffic;
- A development that acknowledges the local landscape character and integrates well into the receiving environment.
- A development that promotes beneficial effects on biodiversity by providing new habitat.

Issues that have been considered throughout the landscape design are:

- Connection to the existing landscape, adjacent land use, proposed buildings, pedestrian and vehicular circulation, shared space;
- The appropriate selection of hard and soft landscape materials;
- Boundary treatments that are in keeping with the surrounding landscape;
- Mitigation of the proposed development, its buildings, access roads and associated services structures.
- Specification of native tree species and plants to enhance biodiversity and visual amenity.

Public Open Space is provided as follows:

- Public Park at Mulladrillen Hill (c. 3.6 ha) provided in accordance with Spot Objective 4 of the Louth CDP 2021-2027

- Public Open Space 01 (c. 1.05 ha) occupying the eastern part of the linear park
- Public Open Space 02 (c. 0.42 ha) occupying the western part of the linear park
- Public Open Space 03 (c. 0.29 ha) pocket park in the south part of the site

Excluding the Public Park at Mulladrillen Hill, the proposed development provides c. 18.6% of the site area as public open space in excess of the 15% required by the development plan.

Communal & Private Open Space

In addition to the generous provision of public open space, a total of 499 sqm of communal open space is provided to the north of the duplex blocks accessed from Bridgegate Avenue, with all residential units provided within private amenity space in the form of garden or terrace (at all duplex units).

The proposed development is therefore consistent with the development standards in relation to open space provision which contributes to a residential development characterised by open recreational space which reflects the site's edge of town location and provides a resource to the wider community in Ardee and the surrounding areas.

2.4.2 Mulladrillen Hill Public Park

The proposed landscaping scheme is focused on the Mulladrillen Hill Park in the northern part of the site extending to c. 3.6 ha which adjoins the permitted public park at the initial phases of Bridgegate to the west. Taken together, the combined park provides c. 7.2 ha or c. 17 acres of public open space, exceeding the requirement of 12 acres (4.9 ha) as set out by Spot Objective 4 of the Louth CDP 2021-2027.

This significant area of public recreation will contribute positively to the character of the development and provides a resource for the residents of Ardee and the surrounding hinterland. Pedestrian connections are made through the proposed park to the permitted park to the west via a pedestrian footpath to the north of Bridgegate Green, whilst also providing a pedestrian footpath to the northern perimeter at Hale Street. A proposed connection to the permitted public park to the west has been routed to the north of Bridgegate Green, as well as at the northwest perimeter of the site linking to the permitted internal road and footpath layout at Bridgegate Drive. The public park includes a range of activity areas such as a dog park, nature-based play area and areas of seating, together with a varied range of planting, lawns, meadows and tree lines, bisected by universally accessible pedestrian routes.

An indicative potential route is shown in the northern part of the site extending from the permitted road at Bridgegate Drive at the northwest perimeter of the subject site. The landscaping scheme identifies an indicative route extending across the site to meet the eastern perimeter. This a potential route and is indicative in nature. Bridgegate Avenue to the south of the public park extends to the eastern boundary of the site in accordance with Objective SS 42 of the Louth CDP 2021-2027 and provides the most efficient route through the site.

The public park is accessed via the main gateway located at the community hub between the crèche and western end of duplex Block A, with a secondary entrance located between duplex Blocks B and C. A footpath is provided to the northern perimeter adjacent to Hale Street. Connections are proposed to the adjoining public park permitted under the parent application at Phases 1-3 at Bridgegate, taken from the southwest corner of the park adjacent to Bridgegate Green and to the northwest at Bridgegate Drive. These routes have been chosen to connect with permitted paths on the lands to the west and enhance permeability through the area. This ensures connectivity throughout the wider public park which extends to c. 7.2 ha and potential links to adjoining lands. The area of the proposed public park excluding the indicative road reservation (occupying 0.225 ha) equates to c. 3.4 ha, with the total park area extending to c. 6.947 ha, in excess of the land zoning objective requirements.

Figure 2.10 – Landscape Drawing of Proposed Public Park



Source: SDA Landscape Architects

2.4.3 Linear Park (Public Open Space 01 & 02)

The proposed linear park is focused on the Rathgory Tributary watercourse which bisects the site flowing east to west. The planning application proposes works to realign the watercourse to provide a legible development area and a more efficient in-stream flow. The watercourse will be open in order to provide a high-quality landscaped feature which will provide a riparian corridor 10m either side of the watercourse contributing to biodiversity within the development.

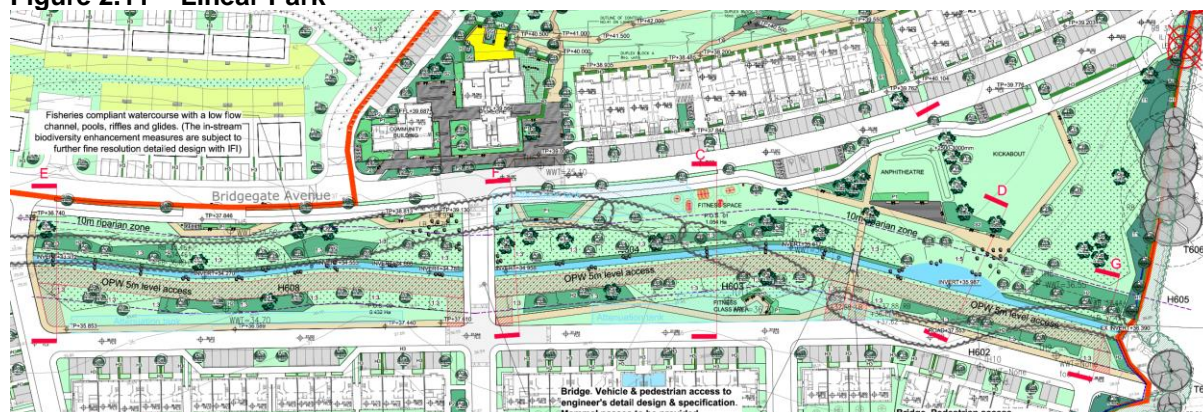
Public Open Space 01 is located to the east of the central crossing point of the Rathgory Tributary which extends south from the community hub to the southern area of the site. The area includes a range of passive and active recreation including fix gym equipment, fitness class area, various elements of seating, an amphitheatre and cycle lanes running through the northern part of the area. An informal kickabout area is also provided in the northeast corner. The open space area contributes c. 1.05 ha to the total open space provided on site. A pedestrian crossing is included in the central part of the open space, with a network of pedestrian paths included. The area is bordered by car and bicycle parking at the northern perimeter with interspersed planting. The landscaping strategy comprises a range of semi-mature tree, hedgerow and shrub planting, as well as a wildflower meadow and retained boundary hedge at the eastern perimeter of the site consolidated by supplementary planting of hazel, blackthorn and holly.

Public Open Space 02 occupies the western part of the linear park and provides continuity in design in terms of the riparian corridor and permeable pedestrian and cycle links which extend through the area which provides c. 0.43 ha of public open space. The area is characterised by a footpath which follows the western perimeter and skirts the southern boundary of the site. Similarly, to POS1, a range of tree and shrub planting is included, primarily in the area north of the watercourse with element of staggered willow planting lining the southern bank. A bus stop is included at Bridgewater Avenue with seating positioned adjacent to this.

The combined linear park provides a focal point of the development for recreation and activity directly adjacent to proposed residential dwellings, also benefitting from passive surveillance. Taken in combination, the area provides c. 1.5 ha of public open space which represents almost 85% of the total

servicing the proposed development, excluding the public park to the north. Figure 2.11 notes the proposed realignment of the watercourse relative to this as currently existing.

Figure 2.11 – Linear Park



Source: SDA Landscape Architects

2.4.4 Pocket Park (Public Open Space 03)

The remaining area of public open space is provided in the southern part of the site and consists of a c. 0.29 ha square centrally located and within 150m of all dwellings proposed. The central link road extending south from the community hub provides a landscaped corridor which leads to the park, which is characterised by semi-mature tree planting along the northern and eastern edges, a pedestrian path which circumvents the central area of lawn and a nature-based play feature including natural stone boulders and street furniture in the eastern part of the site. Areas of seating are located at the northern edge of the park orientated south, with a mix of surface finishes including concrete block paving and hard compacted gravel as provided throughout the site. This is shown in Figure 2.9 above.

All public open spaces within the development, benefit from good levels of passive surveillance from adjacent dwellings, promoting safe and inclusive use for family activity. The comprehensive landscaping scheme comprises the planting of c. 453 new trees throughout the site which is considered to more than compensate for the removal of a limited number of trees and hedgerows (as detailed in the accompanying Arboricultural Report), resulting in a net increase of 446 trees at the site. Tree planting mainly consists of oak, willow, alder, silver and downy birch, mountain ash and Scot's pine, complemented by a range of ornamental shrub planter beds consisting of a range of flowering, evergreen and deciduous perennials selected due to suitability of site conditions.

In addition to the public open spaces distributed throughout the proposed development, a significant quantum of planting of trees and native hedgerow is proposed at site perimeters to consolidate existing mature hedgerows to the eastern and western boundaries and new hedgerow in the form of blackthorn, hazel, holly and hawthorn at southern site boundary alongside perimeter fencing.

2.4.5 Communal Open Space

The quantum of space for each duplex apartment has been designed in accordance with the DoHPLG Planning Guidelines for Design Standards for New Apartments 2020. The accompanying Schedule of Accommodation prepared by Darmody Architecture sets out the provision of communal open space as required to serve the 66 no. duplex apartments proposed.

The minimum requirement is set out as follows:

- 17 no. 1-bed apartments* 5 sqm = 85 sqm
- 24 no. 2-bed (4 person) apartments* 7 sqm = 168 sqm
- 25 no. 3-bed apartments* 9 sqm = 253 sqm

Total = 478sqm

Figure 2.12 – Communal Open Space

Communal Amenity Space - (478sqm minimum required)	
Duplex Communal Amenity Space	499 sqm
TOTAL	499 sqm

Source: Darmody Architecture

Communal open space is provided within 2 no. landscaped areas adjacent to the north of the 4 no. duplex blocks accessed from Bridgeway Avenue. The areas include lawns and pedestrian footpaths with seating and planting provided at central areas. This is in addition to the private amenity spaces provided at each duplex unit by way of external garden or terrace, in accordance with Appendix 1 of the Apartment Guidelines.

2.4.6 Materials, Finishes and Landscaping

The landscaping strategy includes a comprehensive range of materials and finishes to create an enhanced, attractive and user-friendly experience throughout the site. Spatial design proposals are developed to encourage social interaction, engagement with the external environment and the full utilisation of external spaces. Such proposals involve the integration of seating/meeting areas, external reading areas and paving layouts to define a hierarchy of open spaces suitable to a variety of use requirements. These spaces will play a pivotal role in the delivery of a successful development.

The use of native plants will provide optimum biodiversity and aesthetic values. This varied profile is designed to provide a diversity of landscape and habitats throughout the site.

Hard and soft landscape and streetscape elements will be fully detailed and completed to the required level to meet current building regulations and best practice provided by the relevant guidance documentation e.g., Technical Guidance Document Part M – Access and Use Building Regulations (2010) and ‘Building for Everyone: A Universal Design Approach’ by the National Disability Authority.

A range of concrete paving and compressed gravel finishes are included, alongside soft landscape features including grass lawn and wildflower meadows with a wide variety of planting comprising woodland, scrubland and ornament features whilst preserving and protecting existing trees and hedgerows on site. Hedgerows will be retained and consolidated at eastern and western boundaries to provide a landscape buffer with adjacent lands. A range of street furniture and nature based play areas enliven public open spaces complemented by strategically placed seating to enjoy sunlight. The landscaping strategy provides activities for a wide demographic with a focus on play.

2.4.7 Boundary Treatments

The boundary treatments for the proposed development are identified on SDA Landscape Architects drawing no. 20-547-SDA-PD-DR-001 and Landscape Design Report.

Types of boundary treatments proposed are as follows:

- To site boundary: Existing dense hedge retained and managed as dense boundary. New proposed hedge to south site boundary. New proposed hedge at eastern boundary replacing previous.
- To front housing: 1m high hedge.
- Between rear gardens: 1.8m high concrete post, concrete kicker and vertical timber panel.
- Between rear gardens and public areas: 1.8m brickwork wall or rendered block wall.

2.5 ACCESS AND ROAD LAYOUT

2.5.1 Roads & Street Layout

This section is based on information provided by CS Consulting Engineers. The proposed development will be accessed from the N2 Drogheda Road via Bridgeway Avenue permitted in the initial Phases 1-3 of Bridgeway under Reg. Ref.: 10174, as amended. The proposed Phase 4 will extend Bridgeway

Avenue as far as the eastern perimeter and will facilitate access to the southern part of the site via two crossings of the Rathgory Tributary.

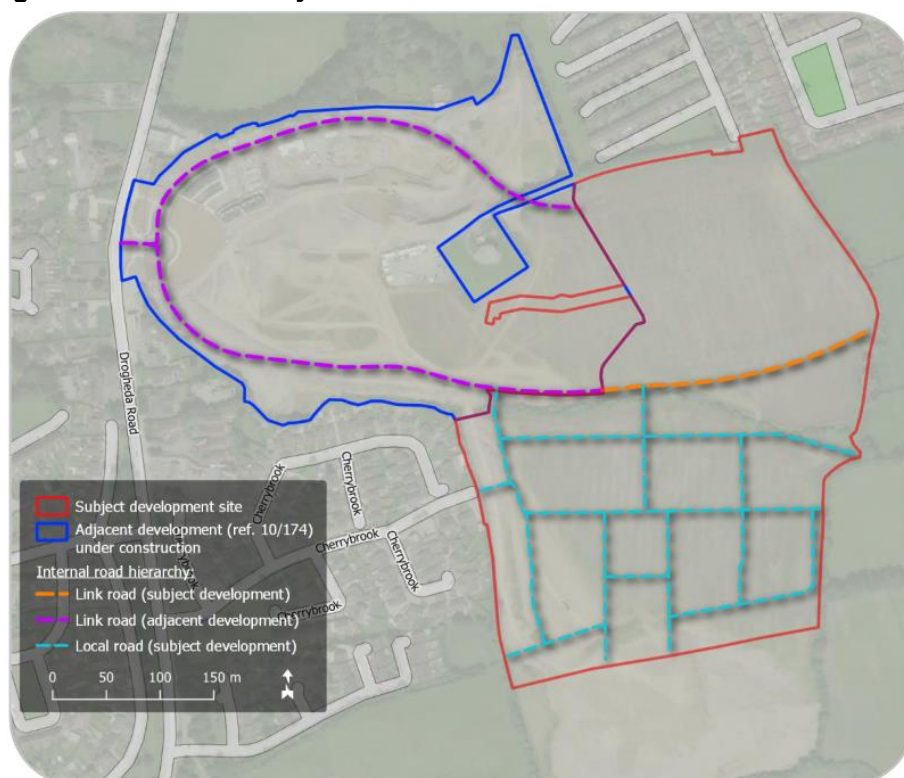
The internal road network has been designed to prioritise legibility and ease of navigation whilst promoting sustainable modes of transport. A bus stop is proposed at the southern side of Bridgesgate Avenue opposite the community hub which will facilitate a local service, enhancing accessibility and providing a link to Ardee town centre and beyond.

As confirmed by CS Consulting, design measures have been implemented to support the above objectives in accordance with the core principles of the Design Manual for Urban Roads and Streets (DMURS). The design of the road infrastructure within the subject development is primarily informed by principles contained within DMURS. Reference has also been made to the following documents:

- Louth County Development Plan 2021-2027
- National Cycle Manual 2011
- Traffic Signs Manual 2019
- DN-GEO-03060: Geometric Design of Junctions
- Sustainable Urban Housing: Design Standards for New Apartments (Guidelines for Planning Authorities)
- National Cycle Manual 2011

The internal road layout of the proposed development comprises a network of local streets, connecting to a link street (Bridgesgate Avenue) that traverses the development site along an east-west axis, extending from Phases 1-3 of the adjacent permitted development, Reg. Ref: 10174 which is currently under construction). This link street within the adjacent development in turn connects to the access junction on the N2 Drogheda Road, to the west which provides the vehicular access to the overall development from the public road network.

Figure 2.13 – DMURS Layout



Source: CS Consulting Engineers

Vehicular and pedestrian access to the development shall be via the internal roads of the adjacent permitted development to the northwest (Reg. Ref.: 10174), which is currently under construction. The adjacent development in turn has vehicular and pedestrian access onto the N2 Drogheda Road.

Provision is also made for a potential future road link to Cherrybrook residential development to the west, as well as to adjoining lands to the south and east, with roads proposed to be constructed to site boundaries within the southern part of the site. We understand that Louth County Council are currently considering an application to take Cherrybrook in charge. The proposed development is not reliant on this for access.

Pedestrian permeability provided at the western boundary to link with Bridgegate Drive and Bridgegate Grove to connect with the public park permitted under Reg. Ref.: 10174, with a footpath meeting the northern perimeter of the site adjacent to Hale Street.

All internal roads within the development have been designed for a vehicular traffic speed of 30km/h in order to prioritise movement of vulnerable road users. In accordance with DMURS, kerb radii at internal junctions have generally been restricted to a maximum of 6m. This serves to discourage high vehicle speeds, while also allowing for the occasional circulation of large vehicles such as refuse collection trucks and fire tenders.

All internal roads have a carriageway width of 5.5m (with the exception of Bridgegate Avenue, which has a carriageway width of 6m), comprising one traffic lane in either direction and generally be flanked to either side by a 2m wide pedestrian footpath. Some sections of road include a 5.6m wide perpendicular parking bay to one side of the street, while others include both a 5.6m wide perpendicular parking bay and a 2.4m wide parallel parking bay. These sections of road will still incorporate a 2m wide footpath, at least on one side, in order to facilitate pedestrian permeability.

Footpath widths within the proposed development have been designed in accordance with DMURS. It is proposed to provide a footpath width of 2.0m along internal roads, allowing space for two people to pass comfortably. Kerb radii at internal junctions have generally been restricted to a maximum of 6.0m, in order to discourage high vehicle speeds. Turning heads are provided at cul-de-sacs and traffic calming measures are incorporated into the design of the internal local streets, in the form of raised tables at junctions and horizontal deflections. On-street car parking for the residential units is arranged along the internal roads. It has been ensured that forward visibility splays of at least 24m are achieved at internal junctions, in compliance with DMURS requirements.

2.5.2 Pedestrians & Cyclists

Pedestrian and cyclist access to the proposed development shall initially be facilitated at 2 no. locations at the N2 Drogheda Road, via the access junction and internal road network of the adjacent permitted Bridgegate development to the north-west (currently under construction), with a pedestrian footpath provided to meet the northern perimeter at Hale Street. Provision is also made for a potential future additional access to the development via the existing adjacent Cherrybrook estate, to the west.

Raised footpaths are provided along all internal roads of the development. Further footpaths provide pedestrian connectivity between internal roads, as well as to the development's public open spaces and to the public park located at the centre of the development.

Cycle tracks are provided along the full length of Bridgegate Avenue, in order to provide suitable facilities for cyclists in the event that this forms part of an east-west connector road in the future. Marked pedestrian crossings of the internal roads are provided at several locations, with raised junctions, raised streets, and horizontal deflections to calm vehicular traffic. A total of 296 no. bicycle parking spaces are provided throughout the development as follows:

- 204 no. spaces serving duplexes
- 60 no. visitor spaces
- 32 no. non-residential spaces serving the community hub

Bicycle parking is provided by secure stores between duplex Blocks A and B and C and D, with visitor spaces conveniently locations close to dwellings and interspersed with public open space, with those serving the community hub located within that area adjacent to buildings.

2.5.3 Proposed Bus Stop

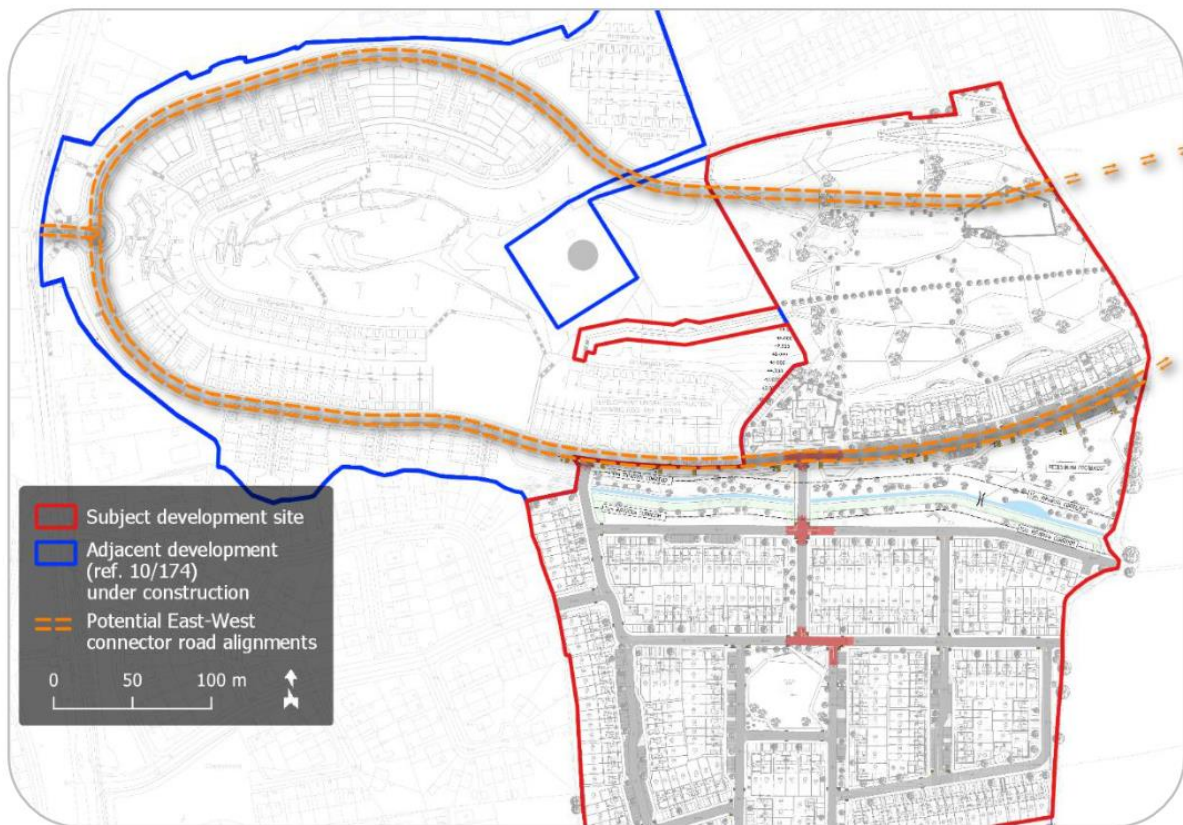
A new bus stop is proposed to be constructed on the southern side of Bridgeway Avenue opposite the community hub at a location within 400 m of all dwellings within the site. This will facilitate the potential future provision of a local bus service through the subject development. The development's internal road layout permits a bus of the type typically used by Local Link services to follow a looped route through the development, servicing this bus stop. This will enhance access and connectivity of the development and provide an alternative to private car use, mitigating pressure on the local road network within Ardee.

2.5.4 Potential for Future Road Link to East

Policy SS 42 of the Louth County Development Plan 2021-2027 seeks to 'facilitate the provision of a new link road from Rathgory and Mulladrillen to Black Road' through the application site. The proposed development is in compliance with this policy as it includes an extension of Bridgeway Avenue to meet the eastern perimeter and has therefore been designed to facilitate the provision of this road on the subject lands. In addition, an indicative road reserve route through the public park in the northern part of the site is provided for a potential future link. It is noted that the lands adjoining to the east are outside the ownership of the applicant and zoned 'L1 Strategic Reserve'.

These potential routes are shown below.

Figure 2.14 – Potential Connections to Lands to the East



Source: CS Consulting Engineers

It is noted that the applicant is not in ownership of the agricultural lands outside the red line boundary to the east. The routes shown through these lands are indicative and dependent on third party agreement and the future development of the road link by Louth County Council. They do not form part of this application.

The proposed development provides the extension of Bridgeway Avenue to the eastern boundary south of the public park, in compliance with Objective SS 42 of the Louth County Development Plan 2021-2027.

2.6 SERVICES

2.6.1 Foul Drainage

This section is based on information provided by CS Consulting and JBA Consulting. The proposed development will make optimal use of the in-situ drainage infrastructure permitted under Reg. Ref.: 10174 and as amended under Reg. Ref.: 19336 and 19353. The current site is not currently developed and as such no sewers are located on the subject lands. All effluent generated in Ardee is conveyed to the Regional Wastewater Treatment Plant (EPA Licence Number D0117/01). The Regional Treatment Plant has recently been upgraded and has expanded capacity from 5,000 PE (population equivalent) to 10,000 PE.

The development will require a new separate foul drainage network to collect and convey the effluent generated by the proposal, connecting to existing network on the N2 Drogheda Road. It is proposed to connect to the stormwater sewer permitted under Reg. Ref.: 10174 (as amended by Reg. Ref.: 19336) adjoining to the west which is currently under construction. The permitted development's foul drainage network has been designed to cater for the flows from the subject site, relating to this SHD application, in addition to its own.

Irish Water have confirmed acceptance of the proposed drainage strategy via a Letter of Design Acceptance having previously issued Confirmation of Feasibility that the development can connect to Irish Water infrastructure. The applicant acknowledges the commentary of Irish Water set out within the Confirmation of Feasibility on the upgrades required to the wastewater network to cater for the additional proposed load. It is understood that the upgrades do not require third party permission (or any other consents) and it will be under the remit and control of Irish Water to implement the upgrade works through the applicant's connection application process following any grant of planning permission.

The drainage strategy has been designed in accordance with the Greater Dublin Strategic Drainage System Guidelines and has been accepted in principle by Louth County Council Infrastructure Services.

2.6.2 Surface Water Drainage & Attenuation/SUDS

At present the subject lands does not have any engineered drainage system in place. The open nature of the site and the natural existing gradients has led the majority of the site to drain to the south into the Rathgory Tributary watercourse.

In accordance with the requirements of Louth County Council, the proposed development shall incorporate Sustainable Drainage Systems (SUDS) principles. These require a two-fold approach to address storm water management on new developments.

The first aspect is to reduce any post development run-off to predevelopment discharge rates (i.e. greenfield runoff rates). The development is to retain storm water volumes predicted to be experienced during extreme rainfall events. This is defined as the volume of storm water generated during a 1-in-100-year storm event, increased by 20% to account for the predicted effects of climate change.

The second aspect requires that storm water quality be improved before disposal and, where applicable, that storm water be permitted to infiltrate into the ground on site rather than discharging to the public drainage system or to watercourses. Infiltration testing has been carried out however it was found that the lands are not viable for infiltration.

Surface water and runoff will be attenuated to 4 no. Stormtech storage units located beneath areas of public open space and subject to treatment before being discharged at greenfield rates by a hydrobrake control to the realigned Rathgory Tributary.

The objective of SUDS is to provide an effective system to mitigate the adverse effects of storm water runoff, through enhanced quality systems and on local infrastructure to aid in preventing downstream flooding. The features proposed are designed to reduce run-off volumes, pollution concentrations and

enhance groundwater recharge and biodiversity. The proposed SUDS features within the subject development consist of:

- Low water usage sanitary appliances;
- Water butts to retain rainwater for re-use for landscaping and maintenance purposes; and
- Permeable paving for car-parking bays

2.6.3 Site Specific Flood Risk Assessment & Rathgory Tributary Realignment

A Site Specific Flood Risk Assessment (SSFRA) has been prepared by JBA Consulting and accompanies this application. The majority of the application site is located within Flood Zone C (including all dwellings). The eastern part of the site is located within Flood Zone A in the context of the latest OPW mapping tool found at www.floodinfo.ie which proposed as wildflower meadow in the proposed landscaping scheme. No hard standing development is proposed within this area.

The Rathgory Tributary flows through the site in a westerly direction. There are no records of previous flooding on the application site. The SSFRA concludes that:

'Risk to the site is managed in accordance with the Louth County Development Plan guidance. Floor levels are set to the 1% AEP climate change water level, plus a freeboard allowance of at least 1.25m. Further, the finished floor level provide a minimum of 150mm above surrounding ground levels to provide protection against pluvial flooding. All residential buildings have also been located in Flood Zone C, further minimising the risk of inundation. The part of the site within Flood Zone A/B is kept as a meadow/open space and the riparian corridor is also provided. Overall there is a small decrease in the peak flood flows downstream of the site and there are no negative impacts elsewhere.'

All recommendations have been taken into consideration in the design of the proposals.

The proposed development includes the realignment of the Rathgory Tributary to optimise the in-stream flow, regularise the internal access and layout of the proposed development and provide a riparian corridor within a linear park which will contribute positively to the environment of the development and enhance biodiversity.

As set out in the Site Specific Flood Risk Assessment prepared by JBA, the stream's hydraulic conveyance will be maintained and OPW hydraulic requirements (under Section 9 of the Arterial Drainage Act) applied for after any grant of planning permission. Section 50 applications will also be made in due course for the culverts to be placed within the watercourse. JBA have undertaken hydraulic modelling of the realigned stream based on OPW mapping. The SSFRA notes that:

- All residential development is located in Flood Zone C.
- No displacement of flood waters will be encountered as part of the proposed design.
- Finished Floor Levels have been set above the 1-in-1,000-year event level, plus freeboard of 500mm.

This is detailed further within Chapter 6 – Water.

2.6.4 Water Supply

The proposed watermain network system has been designed in accordance with the specifications and requirements of Irish Water. The subject development's potable water supply network has been designed to be connected into the adjacent permitted development (Reg. Ref.: 10174 and 19/336) to the west, which is currently under construction.

As per the Irish Water Confirmation of Feasibility letter, a connection to the existing water network can be facilitated, with the exact connection location and requirements to be agreed at connection application stage.

The water main layout and details are in accordance with the *'Irish Water Code of Practice for Water Infrastructure'* and the *'Irish Water Code of Practice for Wastewater Infrastructure'*.

2.6.5 ESB Supply

The proposed development site is greenfield and does not have a current connection into the local ESB network. The subject lands currently has a live ESB Electrical network supply to the west of the site.

The power supply infrastructure for the proposed development site will require an extension of the existing power supply infrastructure currently in place and under construction for the permitted residential development to the west of the site. ESB Networks have been contacted in preparation of this application.

There are existing ESB overground MV/LV line crossing through the northern area of the proposed site. This area of the site is a landscaped area, no residential development is proposed for this area as part of this application. There is no known existing ESB overground and underground infrastructure located in the area of the proposed residential development.

Two new ESB sub stations are required to cater for the electrical requirement of the residential development, the substations have been designed into the proposed residential scheme. A formal application to confirm the nature of the ESB supply is made once the formal address of the residential development is agreed with the Planning Authority

2.6.6 Telecommunications

The proposed development site is greenfield and does not have a current connection into the local Broadband EIR network. The proposed development currently has a live EIR network supply to the west of the site.

The telecommunication infrastructure for the proposed development site will require an extension of the existing infrastructure currently in place and under construction for the permitted residential development to the west of the site. EIR have been contacted in preparation of this application. There is no known existing EIR infrastructure located in the proposed residential development. Subject to formal agreement with EIR it is envisaged that EIR will provide a service through the link road to the proposed residential development, the EIR services shall be designed within the proposed residential scheme in accordance with EIR requirements for residential developments.

The proposed development site is greenfield and does not have a current connection into the Virgin Media Broadband network. The proposed development site is greenfield and does not have a current connection into the local network. There is no local Virgin Media telecom network currently under construction in the local area. Virgin Media have been contacted and they confirmed they are unable to provide a VM service in the area in the short to medium term.

The proposed development site is greenfield and does not have a current connection into the SIRO network. The proposed development site is greenfield and does not have a current connection into the local network. There is no local SIRO telecom network currently under construction in the local area. SIRO have been contacted and they confirmed they are unable to provide a SIRO service in the area in the short to medium term.

2.6.7 Gas

The proposed development site is greenfield and does not have a current connection into the local gas network. The proposed development currently has a live gas supply to the west of the site.

The gas supply infrastructure for the proposed development site will require an extension of the existing supply infrastructure currently in place and under construction for the permitted residential development to the west of the site. There is no known existing gas network infrastructure located in the area of the proposed residential development.

2.7 CONSTRUCTION MANAGEMENT STRATEGY

This section is based on information provided by CS Consulting. An outline Construction Management Plan has been prepared by CS Consulting and accompanies this submission. It is envisaged that the

development of the lands will occur over 6 phases as detailed within the outline CMP. The proposed development site is greenfield and does not have a current connection into the local gas network. The proposed development currently has a live gas supply to the west of the site.

The gas supply infrastructure for the proposed development site will require an extension of the existing supply infrastructure currently in place and under construction for the permitted residential development to the west of the site. There is no known existing gas network infrastructure located in the area of the proposed residential development.

2.7.1 Main Stages/Phases of Construction

The applicant proposes to deliver the development in 6 no. phases.

Phase 1 will consist of the part of the crèche and community building, associated parking and infrastructure in the northern part of the site on Bridgeway Avenue, as well as the central spine branching to the south which provides a connection to the southern part of the site via the watercourse crossing. Dwellings extending across the southern boundary of the open space is included. This will include 40 no. dwellings, parking, landscaping, open space at POS1 and POS2, including pedestrian watercourse crossing, part of the crèche and community building and associated infrastructure. A total of 4 no. Part V units will be delivered in this phase.

Phase 2 will comprise public open space POS3, including 45 no. dwellings, parking, landscaping, access and associated infrastructure at the central part of the site. A total of 6 no. Part V units will be delivered in this phase.

Phase 3 will comprise the balance of the crèche (with cumulative demand arising in later phases to ensure the viability of the creche when operational), Bridgeway Avenue extending east and the Public Park and communal open space to the north of the duplex blocks, including 48 no. dwellings, parking, landscaping, access, part crèche and public park and associated infrastructure. A total of 4 no. Part V units will be delivered in this phase.

Phase 4 will comprise the eastern part of the proposed development including 49 no. dwellings, parking, landscaping, access and associated infrastructure. A total of 10 no. Part V units will be delivered in this phase.

Phase 5 will comprise 46 no. dwellings, parking, landscaping, access and associated infrastructure at the southern perimeter of the site. A total of 2 no. Part V units will be delivered in this phase.

Phase 6 will comprise the balance of 44 no. units at Bridgeway Way at the western part of the site, including parking, landscaping, access and associated infrastructure. A total of 2 no. Part V units will be delivered in this phase.

The 28 no. Part V units are distributed throughout the site and will be built out in accordance with each phase. Public open space and the community facilities will be constructed in development Phase 1, 2 and 3.

Figure 2.15 – Phasing Plan



Source: CS Consulting CMP

Archaeological monitoring of earthmoving works for site preparation will be undertaken to ensure that any features of an archaeological nature that may be revealed are identified, recorded and fully resolved in accordance with the recommendation set out in Chapter 13 of this EIAR.

Chapter 5, Land and Soils provides detailed information on excavation material and mineralogy. Chapter 11, Waste Management contains more detailed information on Resource and Waste Management associated with the project. Mitigation measures to minimise environmental impacts are described in the relevant sections of the EIAR.

2.7.2 Construction Traffic

Access to the development site for construction traffic shall be from Bridgeway Avenue; this is the primary link street running through the southern section of the adjacent permitted development to the northwest (Reg. Ref.: 10174), which is currently under construction. The adjacent development in turn has vehicular access onto the N2 (Drogheda Road) to the west via a recently constructed simple priority junction. From the N2, construction traffic can access the M1 motorway, via the R170 and the N33, bypassing Ardee town centre.

A temporary priority-controlled junction will be created on Bridgeway Avenue, at the western corner of the subject development site which will be used by all construction traffic entering and exiting the site. Bridgeway Avenue is also to be continued eastward as part of the subject development, and this will form the public access to all completed phases of the subject development while construction works are ongoing in other phases.

All vehicular access routes during the construction phase will be laid out in accordance with the requirements of Chapter 8 of the Traffic Signs Manual. Security personnel will be present at the site entrance/exit to ensure that all traffic exiting the construction site does so safely. A wheel wash will be

installed at the exit from the site, to prevent excess dirt being carried out into the public road. If necessary, a road sweeper will be used to keep the public road around the site clean.

Construction-related vehicle movements will be minimized through:

- Consolidation of delivery loads to/from the site and scheduling of large deliveries to occur outside of peak periods;
- Use of precast/prefabricated materials where possible;
- Reuse of 'cut' material generated by the construction works on site where possible, through various accommodation works;
- Provision of adequate storage space on site;
- Development of a strategy to minimise construction material quantities as much as possible;
- Promotion of public transport use by construction personnel, in order to minimise staff vehicle movements.

All deliveries to site will be scheduled to ensure their timely arrival and avoid the need for storing large quantities of materials on site. Deliveries will be scheduled outside of rush hour traffic to avoid disturbance to pedestrian and vehicular traffic in the vicinity of the site.

2.7.3 Hoarding and Fences

Prevention of unauthorised access to the site is a very high priority and will be vigorously managed throughout the construction period. When the contractor is appointed, the site will be secured with site barriers and hoardings in accordance with the final Detailed Construction Management Plan. Any hoardings and signboards to the perimeter of the site will comply with the requirements of the relevant authorities and the relevant Health and Safety Acts. The contractor will be required to erect a single project signboard to the hoarding at the main entrance points to identify the site.

2.7.4 Storm Water and Waste Management

Storm water and wastewater management will be constructed as per the conditions of the approved planning permission. The purpose of these procedures is to ensure that storm water and wastewater runoff is managed and that there is no off-site environment impact caused by overland storm water flows.

The project environmental management plan will be developed in detail to include:

- Silt control on the roads;
- Discharge water from dewatering systems;
- Diversion of clean water;
- Treatment and disposal of wastewater from general clean-up of tools and equipment;
- Spills control;
- A buffer zone of at least 20m separating working machinery from watercourses;
- A prohibition on machinery entering watercourses;
- Refuelling of machinery off-site or at a designated bunded refuelling area;
- Silt trapping or oil interception (to be considered where surface water runoff may enter watercourses).

2.7.5 Noise Monitoring

Noise monitoring will be established on site throughout the project. Noise monitoring shall be carried out for a period of at least 2 weeks prior to any works commencing, in order to establish a baseline, and the results communicated to Louth County Council in the form of baseline reports.

2.7.6 Air Quality Monitoring

Appropriate Air Quality and Dust monitoring will be carried out on a regular basis in accordance with planning conditions and records will be kept of all such monitoring for review by the Planning Authority.

The following measures are proposed to mitigate any air pollution problems that site activity may cause:

- Selection of all operating plant on the basis of incorporating noise reducing systems, with a minimum requirement that effective exhaust silencers be fitted.
- Fitting of compressors with acoustically lined covers, which will remain closed while the machines are in operation.

2.7.7 Construction Works to Riparian Corridor

The proposed diversion of and installation of the culverts in, the Rathgory Tributary will be carried out in the dry, prior to carrying out any instream works, in order to mitigate the silt disruption caused from the installation of the proposed culverts. The installation of culverts will take approx. 5-7 days. During the works period, a project ecologist/senior environmental advisor will be in attendance to monitor sensitive works (instream/connection works). Culvert installation will be carried out in the dry. The Rathgory Tributary will be connected to its new course following the installation under the supervision of the project ecologist and in accordance with Inland Fisheries Guidelines as set out in the Construction & Environmental Management Plan prepared by Altemar and detailed within Chapter 4 – Biodiversity with mitigation measures specified.

2.7.8 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.

2.7.9 Hours of Working

It is anticipated that normal working hours may be 8am to 8pm Monday to Friday and 8am to 4pm on a Saturday. However, it may be necessary to work outside of these hours at night and at weekends during certain activities and stages of the development (e.g. concrete pouring) which will be subject to agreement with the Planning Authority.

Deliveries of material to site will be planned to avoid high volume periods. 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 for the project prior to commencement.

2.7.10 Construction Traffic Management Plan

A Construction Traffic Management Plan (CTMP) will be prepared by the main contractor and agreed with the Planning Authority prior to commencement of development in the event of a grant of permission. An outline CTMP, prepared by CS Consulting Engineers is included with the planning application forming part of the Outline Construction Management Plan and further detailed in Chapter 10 of the EIAR: Material Assets -Traffic. The CTMP will implement the mitigation measures detailed in the EIAR (including the outline CMP).

In summary, the access to the development site for construction traffic shall be from Bridgegate Avenue; this is the primary link street running through the southern section of the adjacent permitted development to the northwest (planning ref. 10174), which is currently under construction. The adjacent development in turn has vehicular access onto the N2 (Drogheda Road) to the west via a recently constructed simple priority junction (see Figure 13 of the CS Consulting TTA). From the N2, construction traffic may access the M1 motorway, via the R170 and the N33, bypassing Ardee town centre.

A temporary priority-controlled junction will be created on Bridgegate Avenue, at the north-west corner of the subject development site; this junction will be used by all construction traffic entering and exiting the site. Bridgegate Avenue is also to be continued eastward as part of the subject development, and this shall form the public access to all completed phases of the subject development while construction works are ongoing in other phases.

2.8 ENERGY STATEMENT

This section is based on information provided by MandE Consulting Engineers. As detailed in the submitted Energy Report prepared by MandE Consulting Engineers, 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 2011, Conservation of Energy & Fuel (hereinafter referred to as Part L) and anticipated future revisions.

The current edition of the Building Regulations Technical Guidance Document Part L – Conservation of Fuel and Energy – Dwellings 2019 sets out the requirements for the minimum fabric and air permeability requirements, maximum primary energy use and carbon dioxide (CO₂) emissions as well as the minimum amount of energy derived from renewable sources, as calculated using the Domestic Energy Assessment Procedure (DEAP) methodology. The compliance with the requirements of this document is compulsory for all new dwellings.

Three design aspects demonstrate compliance:

1. The quality of building fabric
2. The limitation of primary energy use and CO₂ emissions
3. The use of energy from renewable sources

The current edition of the Building regulations “TGD-L 2019” published in July 2019 sets out the design requirements for Nearly Zero Energy Buildings (NZEB). In accordance with the requirements of The European Energy Performance of Buildings Directive Recast (EPBD) all new buildings must achieve the Nearly Zero Energy Building (NZEB) standard.

As part of the development’s efforts to further reduce energy consumption, the residential units shall target a minimum BER rating of ‘A2’ and commercial unit an A3 rating.

The practical implementation of the Design and Material principles has informed the design of the building envelope, internal layouts, facades and detailing has informed the materiality of the proposed development.

The proposed dwellings and buildings are designed in accordance with the Building Regulations, in particular Part D ‘Materials and Workmanship’, which includes all elements of the construction. The Design Principles and Specification are applied to the housing units and the communal / amenity parts of the development.

2.8.1 Renewable Technologies

In order to demonstrate the compliance with the Building Regulations Part L, each dwelling is required to have a portion of its energy requirements provided from a source of renewable energy.

In addition to heat pumps additional Solar PV panels on the roof of the residential buildings may be provided as required to ensure building regulation compliance subject to detailed design.

2.8.2 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 this EIAR sets out the potential impacts and mitigation measures associated with the proposed development in respect of air quality and climate.

2.9 EMISSIONS AND WASTE

This section is based on information provided by CS Consulting and AWN Consulting.

2.9.1 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 or released to the Rathgory Tributary at greenfield equivalent rates. Details of the impacts and remedial and mitigation measures for surface water and foul drainage are recorded at Chapter 6 of this Environmental Impact Assessment Report.

2.9.2 Municipal Waste/Waste Management

A Construction Waste Management Plan and an Operational Waste Management Plan (both prepared by AWN) are included with the application.

The purpose of the Construction Waste Management Plan plan is to provide information necessary to ensure that the management of construction waste at the site is undertaken in accordance with current legal and industry standards including the *Waste Management Acts 1996 - 2011* and associated Regulations, *Protection of the Environment Act 2003* as amended, *Litter Pollution Act 1997* as amended and the *Eastern-Midlands Region Waste Management Plan 2015 – 2021*. In particular, the Plan aims to ensure maximum recycling, reuse and recovery of waste with diversion from landfill, wherever possible. It also seeks to provide guidance on the appropriate collection and transport of waste from the site to prevent issues associated with litter or more serious environmental pollution (e.g. contamination of soil and/or water).

This Construction WMP includes information on the legal and policy framework for construction and demolition waste management in Ireland, estimates of the type and quantity of construction and demolition waste to be generated by the proposed development and makes recommendations for management of different waste streams.

The National Construction and Demolition Waste Council (NCDWC) was launched in June 2002, as one of the recommendations of the Forum for the Construction Industry, in the Task Force B4 final report. The NCDWC subsequently produced '*Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects*' in July 2006 in conjunction with the then Department of the Environment, Heritage and Local Government (DoEHLG). The guidelines outline the issues that need to be addressed at the pre-planning stage of a development all the way through to its completion. These guidelines have been followed in the preparation of this document and include the following elements:

- Predicted C&D wastes and procedures to prevent, minimise, recycle and reuse wastes;
- Waste disposal/recycling of C&D wastes at the site;
- Provision of training for waste manager and site crew;
- Details of proposed record keeping system;
- Details of waste audit procedures and plan; and
- Details of consultation with relevant bodies i.e. waste recycling companies, Louth County Council (LCC) etc.

Section 3 of the Guidelines identifies thresholds above which there is a requirement for the preparation of a C&D Waste Management Plan for developments, which applies to the current proposal at Bridgeway.

2.9.3 Non-Hazardous Wastes

CS Consulting have estimated that the quantity of excavated material that will be generated has been estimated to be c. 42,096 m³. Any suitable excavated material will be temporarily stockpiled for reuse as fill, where possible, but reuse on site is expected to be limited to c. 7,865m³. It is expected that the remaining c. 34,231m³ of excavated material is to be removed off site for appropriate reuse, recovery and/or disposal.

During the construction phase there may be a surplus of building materials, such as off-cuts of timber, plasterboard, insulation and plastic ducts, broken concrete blocks, bricks, tiles and metal waste. There may also be excess concrete during construction which will need to be disposed of. A significant volume of cardboard and soft plastic waste will be generated from packaging.

Waste will also be generated from construction workers e.g. organic/food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and potentially sewage sludge from temporary welfare facilities provided onsite during the construction phase. Waste printer/toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated infrequently from site offices.

2.9.4 Contaminated Soil

Site investigations were undertaken at this site, which was previously a green field, in March 2018 by Ground Investigations Ireland. Soil samples were collected for analysis against the Waste Acceptance Criteria (WAC). In addition, a site investigation was undertaken on the subject site in June 2021 by Ground Investigations Ireland. The report is submitted with the application and notes the following:

“Based on a review of the data in the context of the 2020 EPA Guidance on waste acceptance criteria at authorised soil recovery facilities the naturally occurring material including the backfill material from the adjacent site which occupies the majority of the site does meet the EPA definition of uncontaminated and therefore does satisfy the “not lead to overall adverse environmental or human health impacts” criteria to be considered a by-product. The material if removed from site should be removed from site as a by-product. Asbestos was not detected in the soil samples.”

If any potentially contaminated material is encountered, it will need to be segregated from clean/inert material, tested and classified as either non-hazardous or hazardous in accordance with the EPA publication entitled ‘Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous’¹² using the *HazWasteOnline* application (or similar approved classification method). The material will then need to be classified as clean, inert, non-hazardous or hazardous in accordance with the *EC Council Decision 2003/33/EC*, which establishes the criteria for the acceptance of waste at landfills.

2.9.5 Hazardous Materials and Substances

As fuels and oils are classed as hazardous materials, any on-site storage of fuel/oil, all storage tanks and all draw-off points will be bunded (or stored in double-skinned tanks) and located in a dedicated, secure area of the site. Provided that these requirements are adhered to and site crew are trained in the appropriate refuelling techniques, it is not expected that there will be any fuel/oil wastage at the site.

Waste paints, glues, adhesives and other known hazardous substances, if generated, will be stored in designated areas. They will generally be present in small volumes only and associated waste volumes generated will be kept to a minimum. Wastes will be stored in appropriate receptacles pending collection by an authorised waste contractor.

In addition, WEEE (containing hazardous components), printer toner/cartridges, batteries (Lead, Ni-Cd or Mercury) and/or fluorescent tubes and other mercury containing waste may be generated during C&D activities or temporary site offices. These wastes (if encountered) will be stored in appropriate receptacles in designated areas of the site pending collection by an authorised waste contractor.

2.9.6 Waste Management Options

Waste materials generated will be segregated on site, where it is practical. Where the on-site segregation of certain waste types is not practical, off-site segregation will be carried out. There will be skips and receptacles provided to facilitate segregation at source where feasible. All waste receptacles leaving site will be covered or enclosed. The appointed waste contractor will collect and transfer the wastes as receptacles are filled. There are numerous waste contractors in the region that provide this service.

All waste arising's will be handled by an approved waste contractor holding a current waste collection permit. All waste arising requiring disposal off-site will be reused, recycled, recovered or disposed of at a facility holding the appropriate registration, permit or licence, as required.

Some of the sub-contractors on site will generate waste in relatively low quantities. The transportation of non-hazardous waste by persons who are not directly involved with the waste business, at weights less than or equal to 2 tonnes, and in vehicles not designed for the carriage of waste, are exempt from the requirement to have a waste collection permit (Ref. Article 30(1)(b) of the Waste Collection Permit Regulations 2007 as amended). Any sub-contractors engaged that do not generate more than 2 tonnes of waste at any one time can transport this waste offsite in their work vehicles (which are not design for the carriage of waste). However, they are required to ensure that the receiving facility has the appropriate COR / permit / licence.

Written records will be maintained by the contractor(s) detailing the waste arising throughout the C&D phases, the classification of each waste type, waste collection permits for all waste contactors who collect waste from the site and COR/permit or licence for the receiving waste facility for all waste removed off site for appropriate reuse, recycling, recovery and/or disposal.

Dedicated bunded storage containers will be provided for hazardous wastes which may arise such as batteries, paints, oils, chemicals etc, if required.

The nominated waste manager will be given responsibility and authority to select a waste team if required, i.e. members of the site crew that will aid them in the organisation, operation and recording of the waste management system implemented on site. The waste manager will have overall responsibility to oversee, record and provide feedback to the client on everyday waste management at the site. Authority will be given to the waste manager to delegate responsibility to sub-contractors, where necessary, and to coordinate with suppliers, service providers and sub-contractors to prioritise waste prevention and material salvage.

The waste manager will be trained in how to set up and maintain a record keeping system, how to perform an audit and how to establish targets for waste management on site. The waste manager will also be trained in the best methods for segregation and storage of recyclable materials, have information on the materials that can be reused on site and be knowledgeable in how to implement the Construction WMP.

2.9.7 Operational Waste Management

The typical non-hazardous and hazardous wastes that will be generated at the proposed development will include the following:

- Dry Mixed Recyclables (DMR) - includes wastepaper (including newspapers, magazines, brochures, catalogues, leaflets), cardboard and plastic packaging, metal cans, plastic bottles, aluminium cans, tins and Tetra Pak cartons;
- Organic waste – food waste and green waste generated from internal plants/flowers;
- Glass; and
- Mixed Non-Recyclable (MNR)/General Waste.

Wastes should be segregated into the above waste types, as appropriate, to ensure compliance with waste legislation and guidance while maximising the re-use, recycling and recovery of waste with diversion from landfill wherever possible. The waste segregation, storage and collection arrangements for each use (i.e. residential and crèche) are described in detail below.

The 48 no. duplex units south of Mulladrillen Park will share two no. shared Waste Storage Areas located at ground level. The crèche will have a separate WSA located at ground level adjacent to the creche. Houses and duplexes units with external access to their back gardens will store their bins in their rear garden, while units without external access to the rear yard will store bins in a shielded bin store at the front of their unit.

Space will be provided in the residential units to accommodate 3 no. bin types to facilitate waste segregation at source. Residents in the duplex units with shared WSAs will be required to take their segregated waste materials to their designated WSA and dispose of their segregated waste into the appropriate bins. Signage will be erected by facilities management, above or on the bins to show exactly which wastes can be put in each. Bins/containers will also be colour coded to avoid cross contamination of the different waste streams.

Houses and duplexes units with external access to their back gardens will store their bins in their rear garden, while units without external access to the rear yard will store bins in a shielded bin store at the front of their unit. It is anticipated that DMR, MNR, organic waste and glass will be collected on a weekly basis.

All waste from the shared residential WSAs and the creche WSA will be transferred from the WSAs by personnel nominated by facilities management company (or waste contractor, depending on arrangement) to the designated temporary collection point located between street carparking and landscaped area. Following collection, bins will promptly be returned to the WSAs by personnel nominated by the facilities management company (or waste contractor, depending on arrangement).

House and duplex residents with individual WSAs will be required to convey their own bins to the curb at the front of their unit for collection on the agreed collection days and to return their bins to the designated holding area after emptying.

It is recommended that bin collection times/days are staggered to reduce the number of bins required to be emptied at once and the time the waste vehicle is onsite. This will be determined during the process of appointment of a waste contractor.

2.9.8 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. Car parking for motor vehicles is provided at surface levels. In general, it is noted that approximately 80% of all cars in Ireland run on unleaded fuel which can be expected to have a reductive effect on air emissions. It is expected therefore that the potential impact will be negligible.

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 8 of this EIAR sets out the potential noise and vibration impacts and mitigation measures associated with the proposed development.

2.10 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 3-15 which deal with '*Aspects of the Environment Considered*'. No significant adverse impact is predicted to arise from the use of natural resources.

2.11 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 Chapters 3-15 which deal with '*Aspects of the Environment Considered*'. There will be no significant direct or indirect effects arising from these sources.

2.12 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, 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.

2.13 TRANSBOUNDARY IMPACTS

Large-scale transboundary projects¹ 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 Ardee, within the administrative area of Louth County Council, transboundary impacts on the environment are not considered relevant in this regard.

2.14 ALTERNATIVES 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 an outline of the main alternatives examined throughout the design and consultation process. This serves to indicate the main reasons for choosing the development proposed, taking into account and providing a comparison of 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).*

¹ 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/Transboundary%20EIA%20Guide.pdf>

Pursuant to Section 3.4.1 of the Draft 2017 EPA Guidelines, the consideration of alternatives also needs to be cognisant of the fact that *“in some instances some of the alternatives described below will not be applicable – e.g. there may be no relevant ‘alternative location’...”*

The Draft 2017 Guidelines are also instructive in stating:

“Analysis of high-level or sectoral strategic alternatives cannot reasonably 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 subject scheme is for the construction of residential units, community, crèche, public park, open space and road and service infrastructure on greenfield agricultural lands which are zoned for residential use and for the provision of a public park in the Louth County Development Plan 2021-2027, sequentially located adjacent to existing development and considered by the Planning Authority as a logical extension of the settlement. Having regard to the above it was not considered necessary to consider alternative sites for the proposed development.

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.

2.14.1 Alternative Locations

Do-nothing Alternative

The site is zoned ‘A2 New Residential Phase 1’ lands park in the Louth County Development Plan 2021-2027 and as such, consideration of alternative sites is not pertinent. Spot Objective 4 of the Louth CDP seeks to provide a public park also retained at the lands. The applicant is currently on site at Phases 1-3 of Bridgeway (Reg. Ref.: 10174) which is under construction.

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 and a public park in Ardee. 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 Ardee which are immediately adjacent to Phase 1-3 at Bridgeway and considered a logical extension to the settlement, commensurate with established residential developments to the west at Cherrybrook and to the north at De La Salle Crescent and Hale Street. The suitability of the lands for development, within an established development area of the County were also key considerations. In a *“do-nothing”* scenario the subject site would continue to remain vacant and undeveloped, representing an inefficient use of scarce urban zoned land. This would fail to achieve the policies and the Core Strategy of the Louth CDP 2021-2027 which zones the site for residential development to facilitate the sustainable growth of the settlement of Ardee.

The Draft EIAR Guidelines 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.”

On the strategic or *‘higher’* matters of already determined policy, we refer to the extant Louth County Development Plan 2015-2021, Ardee Local Area Plan 2010-2016 and the draft Louth County Development Plan 2021-2027 which make reference to policies which support residential growth in Ardee. The results of the Strategic Environmental Assessment of the Plans, which was undertaken in

accordance with the SEA Directive (2001/42/EC) and the results of the AA Screening of the LAP, have been taken into account in preparing this report.

This is of relevance to the proposed development of the site. Planning application Reg. Ref.: 10174; ABP Ref: PL15.238053 originally proposed a development of 281 no. residential dwellings (1 to 4 storeys), community building and neighbourhood centre comprising commercial units at Phases 1-3 at Bridgeway which included the northern section of the subject site. Louth County Council issued a decision to grant planning permission for this development (reduced to 270 units). An Bord Pleanála granted permission for 144 no. units on lands now known as Phases 1-3 of Bridgeway, with the northern part of the subject site excluded due to infrastructure constraints which have now been resolved. The parent permission Reg. Ref.: 10174; ABP Ref: PL15.238053 included an Environmental Impact Statement.

The parent permission has been subject to 4 no. amendment permissions (Reg. Refs.: 19336, 19353, 19549, 19875 and 211475) which has resulted in a total of 155 no. dwellings at Phases 1-3 alongside a crèche and community building located in the southeast part of the site.

2.14.2 Alternative Uses

In addition to residential use, there are other land uses which are permitted in principle on these lands. However, these are complementary to the primary use of the lands and include elements of community facilities, crèche and park (all of which are proposed). It is not considered that an alternative comprising an 'open for consideration' use such as utilities infrastructure or guesthouse would result in the best use of these lands, particularly having regard to the need for housing and the zoning of the majority of the lands for residential development. The environs of the subject site are largely residential in nature, with established residential developments at Cherrybrook to the west and De La Salle Crescent to the north. Educational facilities are located to the north of permitted Phases 1-3 at Bridgeway. 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 which is considered a logical extension of the settlement of Ardee.

2.14.3 Description of Alternative Processes

This is not considered relevant to this EIAR having regard to the nature of the proposed (residential) development.

2.14.4 Comparison of Alternative Designs

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 Building Height' (2018), 'Design Standards for New Apartments' (2020) and 'Sustainable Residential Development in Urban Areas' (2009) as well as where relevant the Louth County Development Plan 2021-2027 and has been the subject of pre-application discussions with the Planning Authority and An Bord Pleanála prior to lodgement of the planning application.

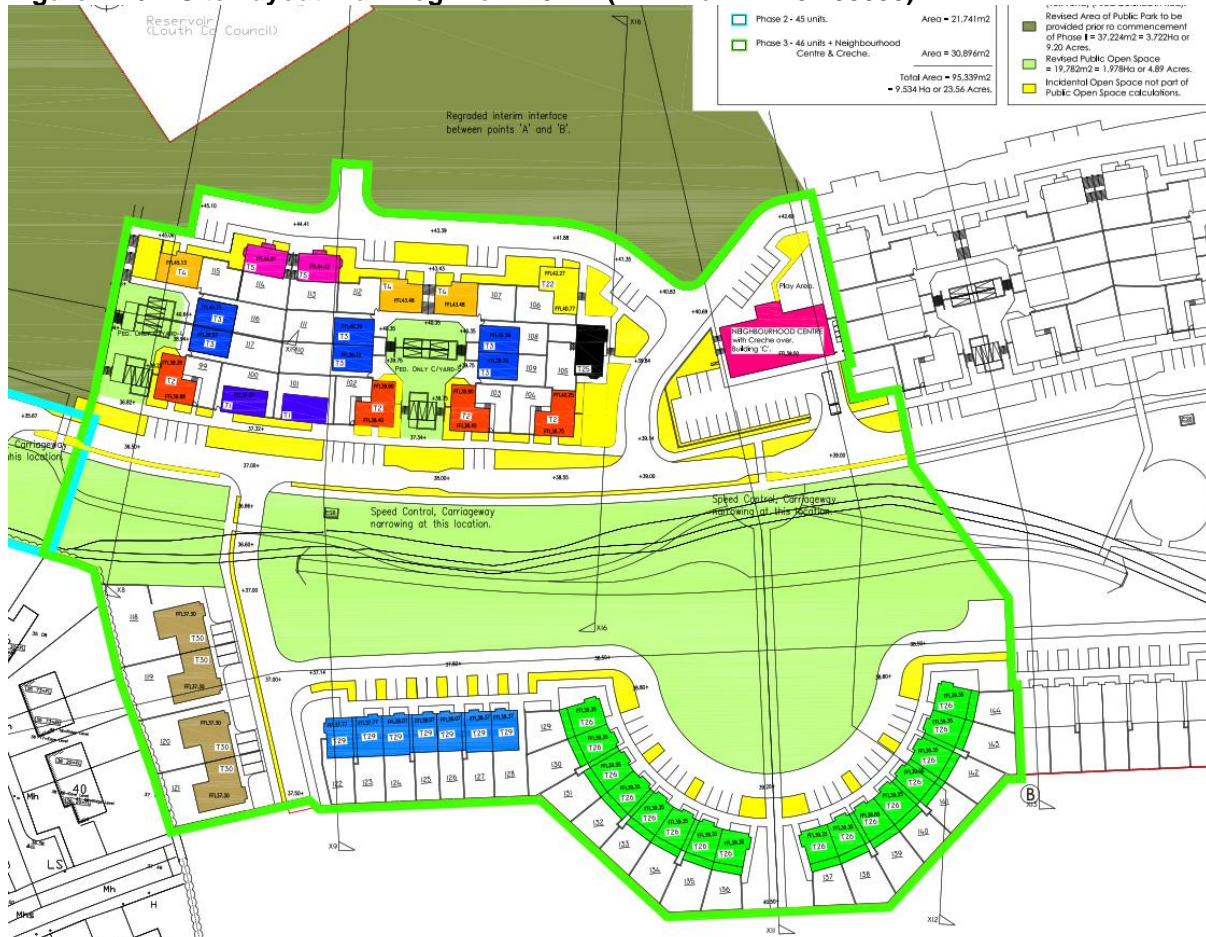
Alternative site layouts and siting progressed throughout the design process in order to minimise the impact on the receiving environment at the earliest opportunity. The initial stage involved a constraints analysis of the land within the proposed development site to identify all high-level constraints and aggregate them against the site to allow a suitable layout to be developed. This has been informed by the extent of the permitted development at Phases 1-3 at Bridgeway (Reg. Ref.: 10174; ABP Ref: ABP Ref: PL15.238053), as amended.

The following analyses alternative development options considered for the site which were incorporated into the scheme as the proposals progressed through pre-application discussions with the Planning Authority. Minutes of meetings with Louth County Council are included at Appendix 1 of the accompanying Statement of Consistency & Planning Report prepared by John Spain Associates.

2.14.4.1 Alternative No. 1 – Permitted Development Reg. Ref. 10174 (ABP Ref: PL 15.238053)

The first alternative considered by the design team was to consider the permitted layout under Planning Reg. Ref. 10174 (ABP Ref: PL 15.238053) granted in February 2012. The permitted site layout as relevant to the subject lands is shown below in Figure 2.29. The area shown illustrates the western section of the subject site.

Figure 2.16 – Site Layout Plan Reg. Ref.: 10174 (ABP Ref: PL 15.238053)

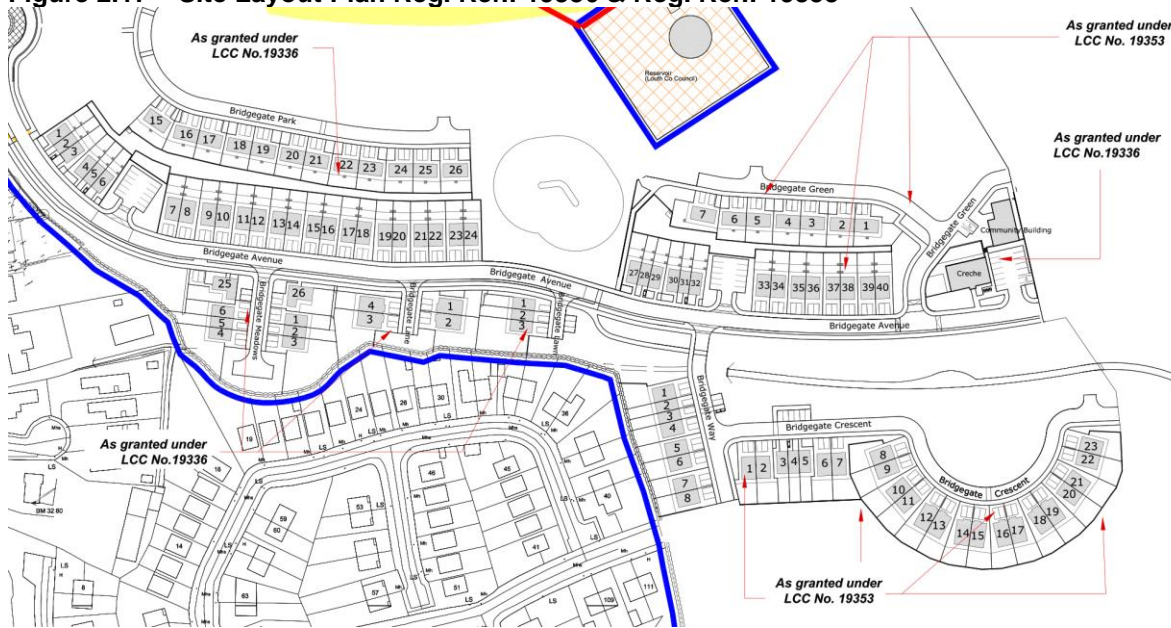


Source: FAA Architects

2.14.4.2 Alternative No. 2 – Permitted Development Reg. Ref. 10174 (ABP Ref: PL 15.238053), as amended under Planning Reg. Ref.: 19336 and Reg. Ref.: 19353

This layout permitted under the parent permission was later amended under Planning Reg. Ref.: 19336 and Reg. Ref.: 19353. The amendment applications proposed a community building and crèche on the site of the neighbourhood centre granted under the parent permission. Amendment application 19353 also included the reconfiguration of the dwellings at Bridgeway Green to promote legibility and buildability having regard to the levels at the locations, as well as increasing the number of dwellings by no. 15 units from 144 no. to 159 no. units.

Figure 2.17 – Site Layout Plan Reg. Ref.: 19336 & Reg. Ref.: 19353



Source: COMMA Architects

Having reviewed the permitted development it was considered that the layout of Bridgegate Crescent would not be conducive to the legibility of the roads and plot layout of the southern part of the application site. The crescent layout would present challenges with the layout on adjacent lands to the site and would be an inefficient use of land in this area of the application site.

The current proposal seeks to make optimum use of the Rathgory Tributary by ensuring this watercourse remains open with a riparian corridor extending from both banks within a larger linear park. This will provide a high quality public open space acting as a focal point to the development and improving levels of biodiversity at the site. The realignment of Bridgegate Crescent on the east-west axis benefits the internal layout on adjoining lands to the south, allowing uniform building lines and passive surveillance looking north across the linear park.

The crèche and community building layout was considered to be inefficient having regard to the site levels at this part of the site at the base of Mulladrillen Hill. The car parking area located in the southern part of the plot as permitted would result in a disjointed layout looking south onto Bridgegate Avenue and would require substantial excavation and reprofiling of land.

2.14.4.3 Alternative No. 3 – Design Development Layout

An alternative layout was prepared by Darmody Architecture in preparation for the pre-application discussions with Louth County Council and An Bord Pleanála for Phase 4 of the development at Bridgegate. This layout was subject to a number of iterations through design development by Darmody Architecture.

Figure 2.18 – Design Development Layout



Source: Darmody Architecture

The design development layout excluded the permitted crèche and community building, open space and the dwellings at Bridgegate Way, whilst including a new crèche east of the community hub. The red line site overlaps with the permitted development at Bridgegate Crescent (Reg. Ref.: 19353), with duplex units provided north of Bridgegate Avenue with 2 no. U-shaped layout blocks and third adjacent to the eastern boundary. To the south of the realigned watercourse, dwellings are sited on the north-south axis at the eastern boundary, with a home zone provided at this location, optimising surveillance to POS1 to the north. A landscaped corridor is proposed orientated south from Bridgegate Avenue linking to a central open space at POS2.

The layout is considered to provide a strong combination of open spaces benefiting from good levels of passive surveillance creating a positive environment for future residents, with home zones introduced to enhance streetscapes and activities.

On review, the layout was not preferable due to the siting and roads layout at Bridgegate Avenue, with roads branching north requiring significant levels of excavation and infrastructure. It was considered that a uniform frontage to Bridgegate Avenue would be preferable and more efficient at this location and would minimise encroachment to the public park adjoining to the north. It was also considered inefficient to exclude the community building and crèche within the red line boundary. The site layout included duplex units at unfavourable locations, with an informal housing cell arranged at the southern part of the site with excessive areas of space. As a result, the proposal was subject to further development prior to engagement and presentation to Louth County Council & An Bord Pleanála.

2.14.4.4 Alternative No. 4 – Pre-Application Consultation Request to ABP

The proposal submitted at Pre-Application Consultation (PAC) Request stage to An Bord Pleanála consisted of 278 no. residential units (212 no. houses, 66 duplex units), crèche and community building, public park, linear park and public open spaces as well as all associated infrastructure. This is shown below.

Figure 2.19 – Proposed Phase 4 Site Layout as per Pre-Application Consultation Request



Source: Darmody Architecture

The site boundary has been amended to overlap with an area of the parent permission at its southern perimeter. The proposed layout as submitted at PAC stage includes a more legible internal road and dwelling layout to the south of a realigned Rathgory Tributary fully compliance with the principles of DMURS. The open watercourse characterises the site northern part of the site to the south of Bridgegate Avenue. It provides the opportunity to implement a sense of place in this location by the design of the linear park which includes a range of passive and active activities and areas of seating etc. as well as pedestrian links through the area.

The siting of units to the north of Bridgegate Avenue have been amended to implement a coherent and legible frontage to the road to the south and to optimise aspects south across the linear park. The layout incorporates a new central community hub to provide a gateway to the northern environment around the public park.

Bridgeway Avenue extends to the eastern boundary in order to facilitate a connector link road through lands to the east in accordance with Objective SS 42 of the Louth CDP 2021-2027. An indicative potential route through the northern part of the public park was also included as an alternative. The

southern part of the site adopts a strong, legible grid format with an additional area of public open space in the centre of this area. The location of home zones and internal layout is considered to have been improved to the design development stage. Potential future links to lands to the south and east are included, as well as to the west at Cherrybrook.

To the north of the Rathgory Tributary, the community hub area is redesigned to that permitted to include a gateway entrance to the public park to the north located to the east of the crèche and west of duplex Block A. Car parking (parallel and perpendicular) is provided at Bridgegate Green to the northwest and along Bridgegate Avenue, with a generously scaled public plaza area providing an attractive entrance to the public park to the north. The layout was however considered to include some elements of irrational street alignment.

2.14.4.5 Alternative 5 - Proposed Site Layout as Submitted to An Bord Pleanála

Following pre-application discussions with Louth County Council and An Bord Pleanála and receipt and consideration of opinions by both authorities, the design team developed an updated site layout for final submission to An Bord Pleanála. The main changes to the layout to that submitted at pre-application stage are as follows:

- Reconfiguration of dwellings at the western boundary of the site to ensure adequate separation distance from the open watercourse of the Rathgory Tributary.
- Redesigned road orientation through the northern part of the public park informed by engineering feasibility study, ensuring most efficient route.
- Improved activation of the internal streetscape network and dual frontage to animate all corners and urban edges.
- Amended design and siting of the crèche and community building at the community hub translates a clear and important transition zone to the public park to the northern.
- Appropriate access and landscaping at the linear park to provide maintenance to the Rathgory Tributary.
- Enhanced pedestrian links between the proposed and permitted public park by the introduction of 2 no. additional connections.
- Introduction of bus stop on Bridgegate Avenue and amended internal road layout.

Figure 2.20 – Proposed Site Layout



Source: Darmody Architecture

The proposed layout now submitted to An Bord Pleanála has been designed to respond appropriately to the opinions of the Board and Louth County Council whilst also meeting the requirements of various statutory bodies which the design team have consulted with in preparation for the submission. This has included the Office of Public Works, Transport Infrastructure Ireland, Irish Water and Inland Fisheries Ireland.

The design team met with Louth County Council in February 2021 to discuss a drainage and flooding solution for the development following feedback at pre-application stage. The design team set out a proposed approach to storm and surface water attenuation within the development which was noted as acceptable and further developed by JBA Consulting and CS Consulting Engineers following the meeting. The design team met again with LCC in April 2021 with a developed drainage proposal which was deemed as acceptable in principle, with the Planning Authority having reviewed the drainage strategy and site specific flood risk assessment prior to lodgement. Consultation with the OPW contributed to a design amendment to the south of the Rathgory Tributary to provide level access of 5 metres immediately adjacent to the channel. A 10 metre clearance from the watercourse has been provided on both sides free of hardstanding development which forms a riparian corridor at this location. Dwellings at the western perimeter have been re-sited to respect adequate separation distances.

Enhanced pedestrian links to the permitted public park to the west are included in the proposal to link with the permitted pedestrian footpath network on the lands adjacent. These links are provided in the northwest perimeter connecting to Bridgeway Drive and at the southwest of the park to the north of the community hub. The red line site boundary has been amended appropriately to provide this link to Bridgeway Green and varied at the southern perimeter to align with the 'A2' land use zoning objective for the site set out in the Louth CDP 2021-2027, resulting in a reduction of 6 units to a total of 272.

The internal road layout has been slightly amended following comments by the Planning Authority infrastructure section and the completion of a Road Quality Audit submitted alongside this application. This has ensured that the proposed layout is compliant with DMURS. A bus stop has also been included on the southern side of Bridgewater Avenue opposite the community hub to facilitate a local bus service and enhance accessibility of the development. The community hub has been subject to amendment to minimise excavation at the site.

2.14.5 Comparison of Environmental Effects of Proposed Preferred Alternative

The proposed development has been designed with the objective of producing an overall high-quality designed scheme that 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. This section outlines an indication of the main reasons for selecting the chosen option with regards to their environmental impacts.

In summary, the design of the proposed development takes into account all environmental effects raised with respect to previous design alternatives and provides for a development that has been optimised to include positive environmental effects whilst reducing negative environmental impacts wherever possible.

With reference to Population and Human Health, the potential impacts are positive for the proposed preferred layout as the permeability of the site improved for future residents, promoting a walkable and sustainable neighbourhood which connects to the permitted public park to the west as well as providing a footpath to meet the northern perimeter at Hale Street. The enhanced public park design and landscaping strategy at the linear park adjacent to the Rathgory Tributary encompasses comprehensive new planting. The uniform building lines to the north and south of the watercourse ensure that the public open space within the linear park benefits from good levels of passive surveillance. This is a positive design intervention having regard to the permitted layout in this area which included a culverted watercourse and curved building line at Bridgewater Crescent which would have resulted in an efficient use and format of land on the adjoining application site to the south. The provision of a bus stop at Bridgewater Avenue will enhance the accessibility of the overall development at Bridgewater and will facilitate connections to Ardee town centre and the surrounding area, providing an alternative mode of travel to the private car.

Air and noise impacts in respect of the alternatives are broadly similar and neutral and long term. The provision of a bus stop may assist in a reduction in car use and mitigate noise impacts whilst improving air quality within the development.

The inclusion of enhanced pedestrian links through the northern part of the site, facilitating access to the north and the permitted public park ensures the development integrates appropriately with the initial phases of development at Bridgewater and is a positive aspect of the proposal, compared to previous alternatives, which did not provide as much permeability. The potential impacts relating to archaeology are considered to be broadly similar for all of the alternatives. With regard to Material Assets (Utilities and Waste Management), it is considered the alternatives are similar as they would require servicing and also ESB etc.

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 key environmental and practical considerations which have influenced the design of the proposed development and the alternative layouts on the subject lands have been influenced by the following:

- The need to achieve an appropriate density in the context of the Sustainable Residential Development in Urban Areas Guidelines for Planning Authorities (2009) having regard to the location of the site.

- The need to ensure any residential development provides a broad and sustainable mix of housing typologies which meet current market demand and which are deliverable in the short to medium term.
- The need to provide a sustainable level of housing provision on the residential zoned lands.
- The requirement to provide a future connector link road to the lands to the east in accordance with Objective SS 42 of the Louth County Development Plan 2021-2027.
- The requirement to provide part of a 12-acre Public Park in accordance with Spot Objective 4 of the Louth County Development Plan 2021-2027.
- The need to include an open watercourse and riparian corridor within the linear park around the Rathgory Tributary to enhance biodiversity on site.
- To have regard to the site's topography and to ensure the design the residential development and associated infrastructure respects the existing features and limits the impacts on the land.
- Protection of existing trees and hedgerows and consolidate boundaries through significant additional planting to enhance the amenity of the area.
- The quality of the urban environment to be delivered and the associated impact on human health.
- The need to provide 10% social housing on site.

Alternative site layouts were considered with the objective of producing an overall high quality designed scheme accommodating in a complementary but clearly demarcated manner in a legible format within a high-quality residential development, which has undergone a robust consideration of relevant alternatives having regard to the comparison of environmental effects.

The preferred alternative was positive in relation to excavation of soils as the overall levels of cut and fill was reduced, whilst also ensuring the realigned watercourse is provided with sufficient landscaped buffers to both sides and accessed appropriately. This will improve levels of biodiversity and enhancing the environment within the development.

With reference to the final layout the iterative process outlined above considered how the permitted layout could integrate with the brief of the proposed development. The design development phase focused on providing an open watercourse at the site to contribute positively to the recreational and ecological quality of the development. This is considered a superior alternative to the permitted layout which incorporated a culverted watercourse which would offer little in terms of biodiversity. The application has considered the feedback and opinions of An Bord Pleanála and Louth County Council in arriving at the submitted layout.

The environmental issues which informed the design process related to ecology, landscape, water, traffic and material assets. These considerations have informed the consideration of alternative layouts, open space, the issue of road and access arrangements up to the submission of the current scheme.

In summary, the design of the proposed development takes into account all environmental effects raised with respect to previous design alternatives for a development that has been optimised to amplify positive environmental effects whilst reducing negative environmental impacts wherever possible.

2.15 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 including a linear park around a realigned watercourse, a public park alongside community facilities including a community building and a crèche at Phase 4 of

the overall Bridgewater development. 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 EIA document; and relate to Population and Human Health, Biodiversity, Water, Lands & Soils, Landscape and Visual Impact and Noise and Air impacts associated with the traffic generated and the realignment of the Rathgory Tributary.

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 have been addressed in the content of this EIA.

2.15.1 Description of Changes to the Project

Draft Guidelines on the information to be contained in environmental impact assessment reports were published by the EPA in August 2017.

The draft guidelines 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 lifecycles 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 growth) does not imply permission for such growth, its identification and consideration can be an important factor in the determination of the application.

- *Descriptions of changes may cover:*
- *Growth*
- *Decommissioning*
- *Other Changes.”*

As per the draft 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.

The proposed development is located within the southern boundary of the Ardee settlement envelope and is surrounded by agricultural lands to the south and east. The subject site is located on lands zoned for the purposes of residential and public park uses. It is noted that lands adjacent to the south and east are zoned ‘L1 Strategic Reserve’ within the Louth County Development Plan 2021-2027 with no likelihood of the development of these lands in the short term. It is noted that these lands are under third party ownership and are not considered viable for development by The Ardee Partnership.

The proposed development has regard to the objectives of the Louth County Development Plan 2021-2027 including Objective SS 42 which requires a road connection between Rathgory / Mulladrillen and Black Road to the east. The proposal includes the extension of Bridgewater Avenue to meet the eastern perimeter which is considered to achieve compliance with this objective. The proposed development also includes a substantial element of public park which benefits the wider community of Ardee and the wider surrounding area in compliance with Spot Objective 4 of the Louth CDP.

The parameters for the future development of the area in the vicinity of the subject site are governed by the Louth County Development Plan 2021-2027. 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. It is noted that no adjoining land is currently zoned for development in the short term.

2.15.2 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.

2.15.3 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”*.

Construction Phase Mitigation

With reference to the construction phase of the proposed development, the objective of the Construction Waste Management Plan 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.

An Environmental Management Plan and Construction Health and Safety Plan will be developed to include relevant mitigation measures outlined in the EIAR.

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 which is located c. 400m west of the subject site. This will serve to mitigate impacts arising from the construction phase of development. The vast majority of the works are away from the public road in a controlled environment. A Construction Traffic Management Plan will be prepared and agreed with Louth County Council, by the contractor prior to the commencement of development. The objective of the CTMP (which will include relevant mitigation contained in this EIAR) which is to minimise the short-term disruption to local residents and reduce the potential for accidents.

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. Construction Traffic Management is detailed further in EIAR Chapter 10: Traffic.

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, contained in the engineering report prepared by JBA Consulting. The

main area of the site where development is proposed is not at risk of fluvial, pluvial or groundwater flooding.

2.16 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. However, all cumulative, secondary and indirect impacts are unlikely to be significant and have been addressed in the content of this EIAR document.

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 and permitted developments (Phases 1-3 are currently under construction to the west) will be minimal.

Other permitted developments include permission Reg. Ref.: 10174; ABP PL15.238053 as amended by permissions:

- Reg. Ref.: 19336
- Reg. Ref.: 19353
- Reg. Ref.: 19549
- Reg. Ref.: 19875
- Reg. Ref.: 211475

These developments form Phases 1-3 of the Bridgegate development on lands to the west of the proposal with the application site overlapping slightly with permitted development at the western perimeter. The proposed development will supersede the permitted development in this area of the site (comprising 31 no. dwellings, open space, crèche and community building) and provide a total of 272 no. units, crèche, community building and open space. This will result in a total of 396 no. dwellings in the overall Bridgegate development subject to a grant of the proposed development.

The potential environmental impacts of permitted developments at Phases 1-3 of Bridgegate have been considered alongside the proposed development in terms of cumulative effect, with impacts considered unlikely to be significant. This is detailed further within the following chapters of the EIAR.

3.0 POPULATION AND HUMAN HEALTH

3.1 INTRODUCTION

The 2014 EIA Directive (2014/52/EU) has updated the list of topics to be addressed in an EIAR and has replaced 'Human Beings' with 'Population and Human Health'. This chapter of the EIAR was prepared by Ian Livingstone MA Honours, MSc. MRTPI, Associate Director with John Spain Associates and reviewed by Rory Kunz, BA (MOD), MScERM, MAT&CP, Dip EIA Mgmt., Executive Director with John Spain Associates. This chapter also reflects findings within other EIAR chapters prepared by the EIAR team as set out below.

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. In preparing this chapter, the assessment is based, where relevant, on the other inputs to this EIAR including, in particular, the chapters prepared by relevant consultants addressing Traffic (CS Consulting), Air Quality and Climate (AWN Consulting), Noise and Vibration (AWN Consulting), and the separate reports addressing Construction and Demolition Waste Management (AWN Consulting), and the Construction and Environmental Management Plan (AWN Consulting). A Human Health Assessment prepared by Dr. Martin Hogan FRCPI FFOMI Occupational & Environmental Physician is provided at Appendix 3.1 and should be read alongside this chapter.

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 EIAR 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 guidance from the EU Commission on the 2014 EIA Directive to indicate in detail how the new term 'Human Health' should be addressed. The 2017 European Commission Guidance on the preparation of Environmental Impact Assessment Reports (2017) states the following in relation to Population and 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.”

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 biodiversity, land and soils, water, air quality, noise, traffic, material assets 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 Draft Guidelines on the information to be contained in environmental impact assessment reports, published by the EPA in August 2017.

Moreover, the content of the Institute of Environmental Management and Assessment [IEMA] high level primer document (2017), which was prepared having considered the provisions of the 2014 EIA Directive, has also been considered in the preparation of this chapter. The IEMA document posits that human health spans environmental, social and economic aspects and does not merely represent an absence of disease. A broad conception of human health is put forward, that should encompass factors such as local economy and community, rather than relying on a narrower focus on biophysical health factors and determinants. In this regard, the current chapter seeks to address population and human health in a holistic manner, including consideration of economic factors, settlement patterns, landscape and visual impact, and land-use.

The 2018 EIA Guidelines published by the DoHPLG state that there is a close interrelationship between the SEA Directive and the 2014 EIA Directive. The Guidelines state that the term ‘Human Health’ is contained within both of these directives, and that a common interpretation of this term should therefore be applied.

To establish the existing receiving environment / baseline, site visits were undertaken to appraise the location and consider any likely and significant potential impact upon human receptors. A desk-based study of published reference documents such as Central Statistics Office Census data, the ESRI Quarterly Economic Commentary, the Regional Spatial and Economic Strategy for the Eastern and Midlands Regional Assembly, the Louth County Development Plan 2021-2027 has also been undertaken. The Strategic Environmental Assessments (SEA) for the Louth County Development Plan has also been reviewed, to provide a consideration of Population and Human Health.

It should be noted that there are numerous inter-related environmental topics described throughout this EIAR document which are also of relevance to Population and Human Health. Issues such as the potential likely and significant impacts of the proposed development on landscape and visual impact, biodiversity, archaeology and cultural heritage, air quality and climate, noise and vibration, water, land and soils, material assets including traffic and transport impacts, residential amenity etc. are of intrinsic direct and indirect consequence to human health. For detailed reference to particular environmental topics please refer to the corresponding chapter of the EIAR.

The Draft Guidelines on the information to be contained in environmental impact assessment reports, published by the EPA in 2017 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, 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.

3.3 THE 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 European Commission, 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, traffic 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 & Employment Activity;
- Social Patterns;
- Land-Use and Settlement Patterns;
- Employment;
- Housing
- Health & Safety; and
- Risk of Major Accidents and Disasters.

3.3.2 Economic & Employment Activity

The CSO's Labour Force Survey for Q4 2021, reflects the continuing impacts of the Covid-19 public health crisis, which has had a significant impact on employment and economic activity both national and internationally.

At the end of December 2021, the COVID-19 Adjusted Measure of Employment, or lower bound of the number of persons aged 15 years and over in employment, is estimated to have been 2,439,099 with an associated COVID-19 Adjusted Employment Rate of 70.9% for those aged 15-64 years.

Looking at the standard LFS labour market measures based on the ILO criteria, there was an annual increase in employment of 229,000 (+10.1%) in the year to the fourth quarter of 2021, bringing total employment to 2,506,000.

In terms of unemployment, the LFS notes the unadjusted number of persons aged 15-74 years who were unemployed in Q4 2021 stood at 195,313 with an associated Unemployment Rate of 7.4%, increasing to 202,027 at the end of January 2022.

In terms of the labour force survey, the total number of persons in the labour force was up 8.9% or 214,800 to 2,633,300 from Q4 2020. The number of persons not in the labour force was 1,411,800 and that was down 10.3% or 161,300 from a year earlier. Increased employment levels resulted in 6.8 million extra hours worked per week in Q4 2021 compared to Q4 2020.

The situation with regard to employment and economic activity is rapidly evolving. The medium to long terms impacts of the Covid-19 emergency on the economy are being seen to as significant on the economy, with the CSO noting that *'the Covid-19 pandemic is continuing to have a considerable impact on the Irish labour market'*.

The quarterly economic commentary from ESRI (for Q4 2021) forecasts that the Irish economy, in Modified Domestic Demand (MDD) terms, is set to register growth of 6.2 per cent in 2021, with unemployment set to fall to 7% by the end of the year. ESRI believe that the economy will continue to grow strongly in 2022, with GDP set to increase by 7%. However, ESRI notes that inflationary pressures in the economy are picking up and price increases over the next year may be greater than previously expected with economic uncertainty predicted.

3.3.3 Social Patterns

The CSO data (Census 2016) illustrates that the population of the Irish State increased between 2011 and 2016 by 3.8%, bringing the total population of the Irish State to 4,761,865. The rate of growth slowed from 8.1% in the previous intercensal period, attributable to the slower economic activity in the early part of the census period resulting in a reduced level of immigration, albeit offset to a degree by strong natural increase.

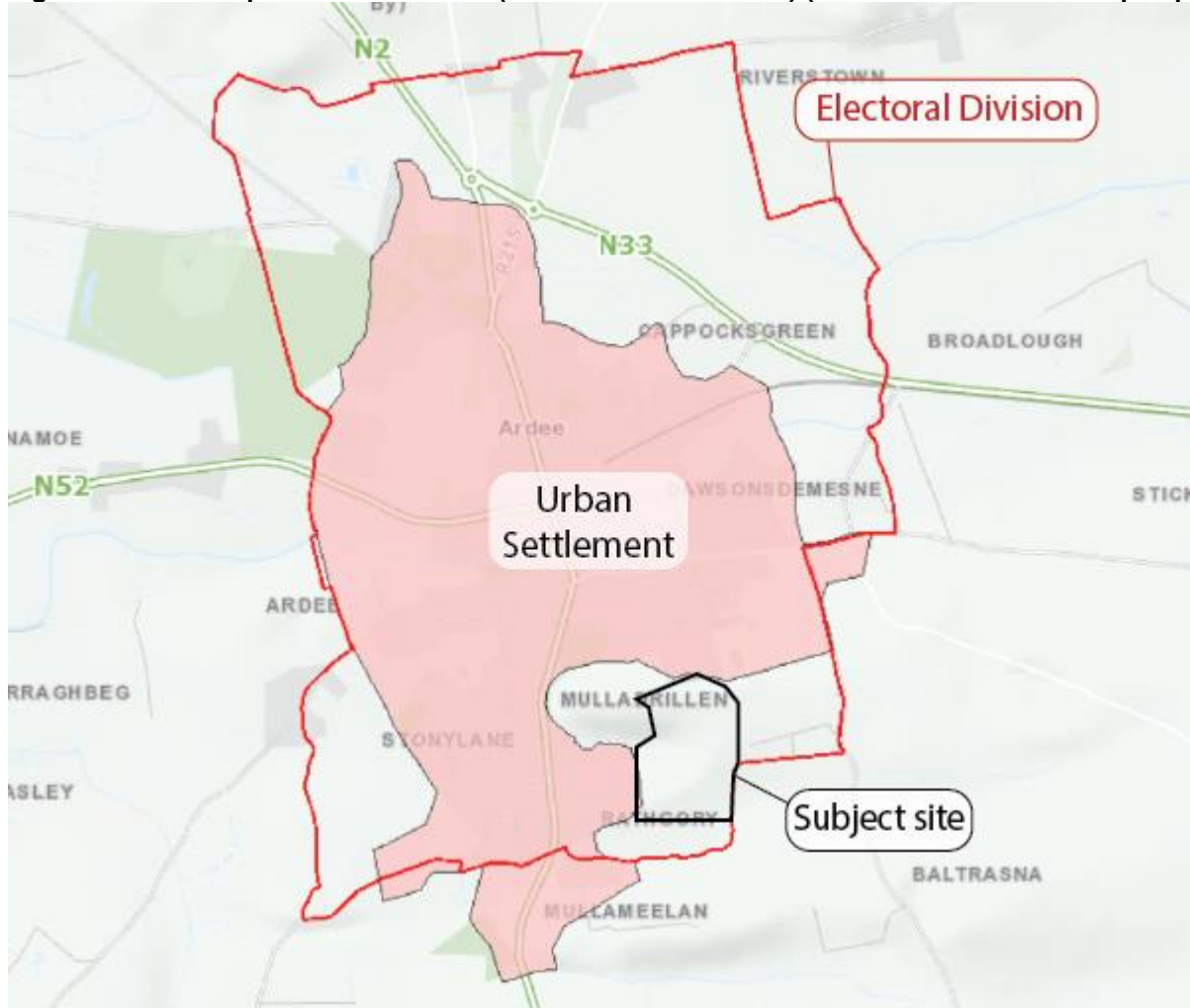
Growth within County Louth was higher than the State average during the 2011-2016 intercensal period at 4.9%. Population growth within the Urban Settlement of Ardee was nominal, however, within the area of the Ardee Urban Electoral Division there was a higher population growth, of c. 7.4%.

The economy had recovered in recent years with consequent population growth predominantly attributed to natural increase, greater economic activity, increased job opportunities and continued immigration. The impact of the ongoing Covid-19 crisis is as yet unknown in terms of population in the medium term. The subject site lies sequentially adjacent to the urban settlement of Ardee, (as defined by the built up area for the purposes of the census), and within the electoral division of Ardee, Urban, which takes in the existing built up areas of Ardee and some of the surrounding area.

Table 3.1: Population change in the State, Louth County, Ardee Settlement and Ardee Urban Electoral Division Level 2011-2016 (Source: CSO)

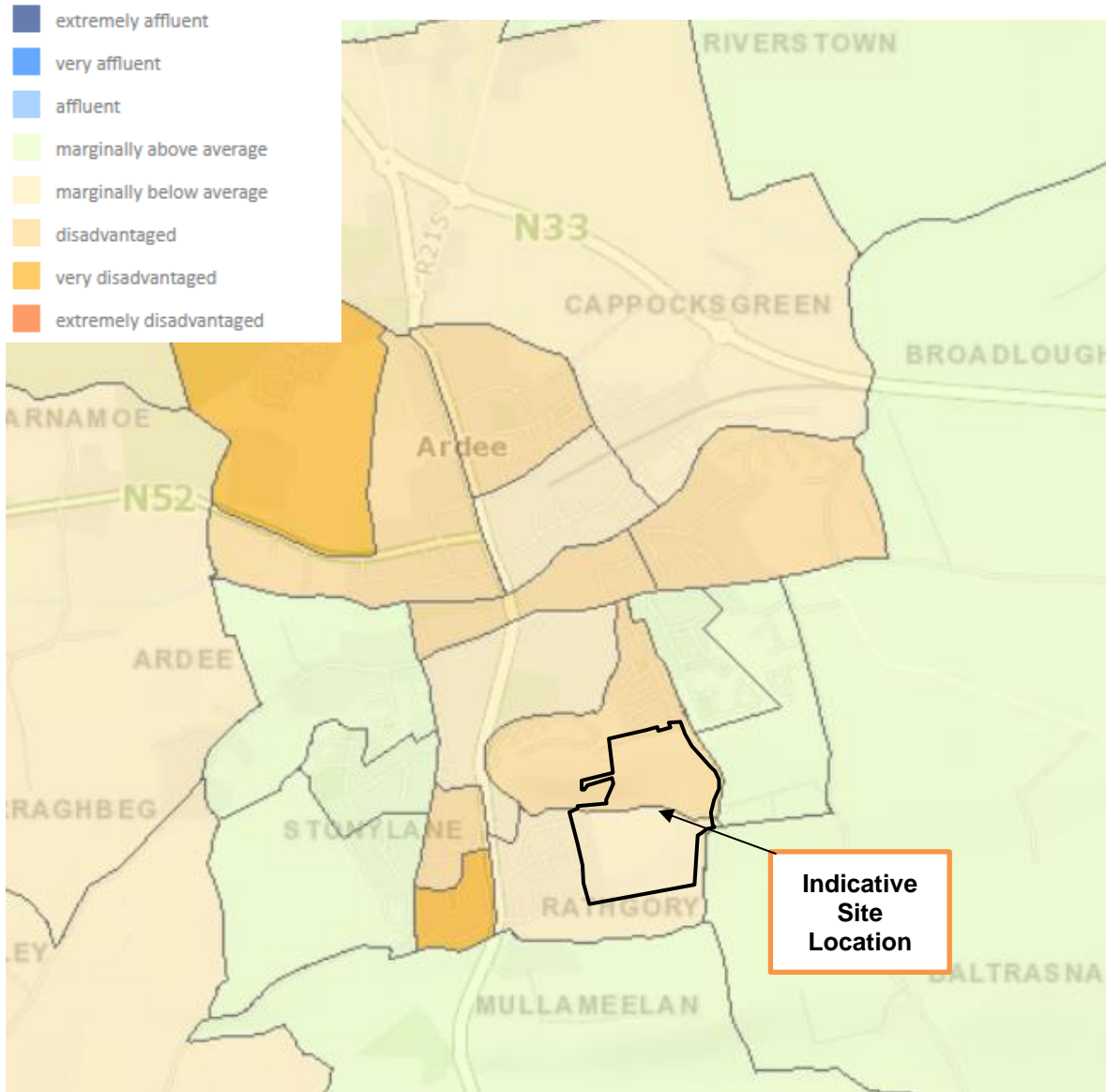
Area	Number of Persons		
	2011	2016	% change 11-16
Ireland - State	4,588,252	4,761,865	3.8
Louth County	122,897	128,884	4.9
Ardee Settlement	4,927	4,928	0
Ardee, Urban, Electoral Division	4,554	4,919	7.4

Figure 3.1: SAP Map of the Ardee Area (indicative site location) (Source census.cso.ie/sapmap_2016/)



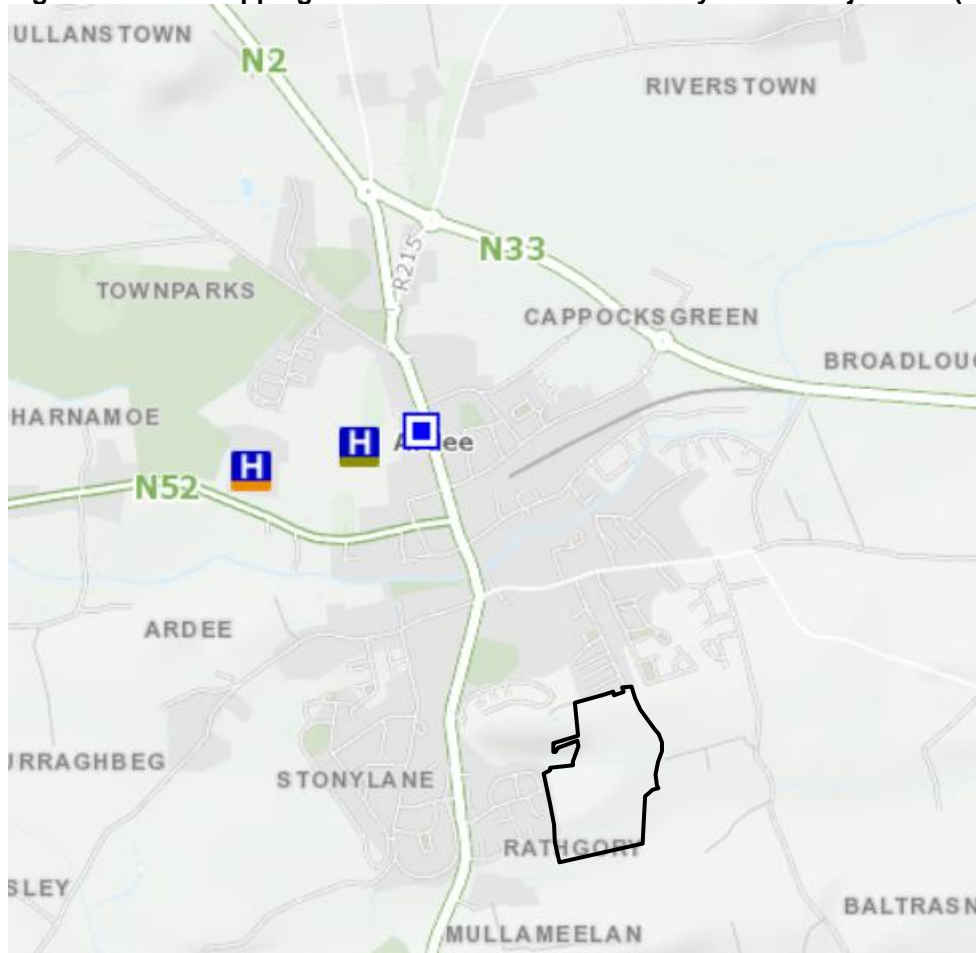
Pobal deprivation mapping of the area surrounding the subject site (see Figure 3.2 below) reveals an area surrounding the subject site which is generally marginally below average. The site itself is between marginally below average and disadvantaged. There are some pockets of very disadvantaged within the area. The data represented in the figure below originates from the 2016 census and is represented by small area.

Figure 3.2: Pobal deprivation mapping of the area surrounding the subject site.



OSI mapping of the area identifies one HSE medical centre in the vicinity of the subject site, and also notes the location of St. Joseph’s Hospital and St. Brigid’s Hospitals in Ardee.

Figure 3.3: OSI Mapping of health centres in the vicinity of the subject site (indicative location)



3.3.4 Land Use & Settlement Patterns

The subject site is located c.1km south of Ardee town centre, to the east of the N2 Drogheda Road. The subject site is located to the east of the N2 Drogheda Road and adjoining the existing residential developments at Cherrybrook and Bridgegate. The site's primary site entrance is via the N2 Drogheda Road via Bridgegate Avenue which forms part of the permitted development at Phase 1-3 of the development (Reg. Ref.: 10174; ABP Ref: PL15.238053), with access to Hale Street provided at the northeast corner of the site. A future potential access to Cherrybrook to the west is provided for by the layout of the internal road network, subject to landowner agreement. These connections provide access to Ardee town centre to the north and the wider transport network to the south. The surrounding area is characterised by agricultural, residential and educational land uses and convenience retail.

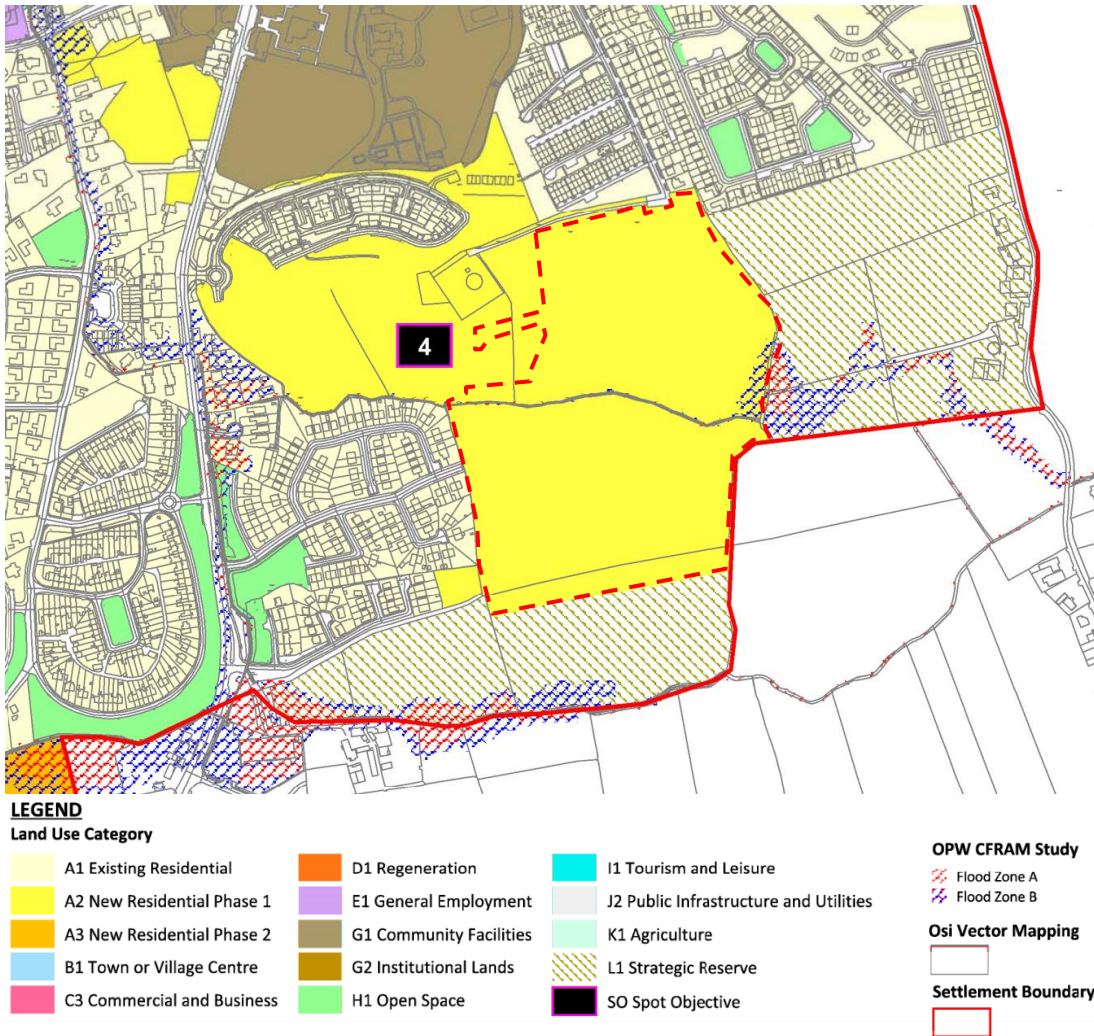
The site is bound by agricultural lands to the south and east, with residential development (mainly single and 2 no. storey in character) located adjacent to the north at De La Salle Crescent and west at Cherrybrook, with the site considered to be a logical extension of the settlement (noted by LCC during pre-application discussion: refer to Appendix 1 of Statement of Consistency). The N2 Drogheda Road is located to the west, from which Bridgegate is accessed. The initial phases of development at Bridgegate are under construction (by the applicant) to the northwest comprising 155 no. dwellings, open space and public park. Scoil Mhuire Na Trocaire and National School are located adjacent to the north. Bus stops are located on the N2 Drogheda Road in close proximity to the site, with a bus stop proposed within the subject site on Bridgegate Avenue to serve the development and enhance accessibility in the local area.

The development will consolidate the existing and permitted urban built form and provides a new area of residential use which benefits from good links to the town centre, which respects the character being established within the area by established and new neighbourhoods to the north and north and is located in proximity to local schools to the north as well as a range of recreational (GAA) and retail uses (Lidl supermarket) to the

south, in addition to those provided between the subject site and the town centre. The site is well served by existing local facilities and services.

The proposed development, cumulatively with the permitted scheme at Phases 1-3 at Bridgegate, will provide a significant element of public infrastructure in the form of a c. 7.2 ha public park, of which c. 3.6 ha will be located within the subject site. The proposal will also provide roads infrastructure to facilitate a potential future connection to Jumping Church Road / Black Road via third party lands to the east. These elements of the development will be implemented in accordance with the objectives of the Louth County Development Plan 2021-2027 and will benefit the wider community by providing enhanced public facilities, also including a crèche and community building. The indicative outline of the subject site is shown below in dashed red line.

Figure 3.4 – Land Use Zoning Map



(Source: Louth County Development Plan 2021-2027)

3.3.5 Housing

In terms of housing delivery, the proposed development is located at a location which is zoned for residential development (as outlined in figure 3.4) and which is appropriate for the uses proposed. There is a significant and established housing need in the Eastern and Midlands Region 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 the Housing for All – A New Housing Plan for Ireland 2021.

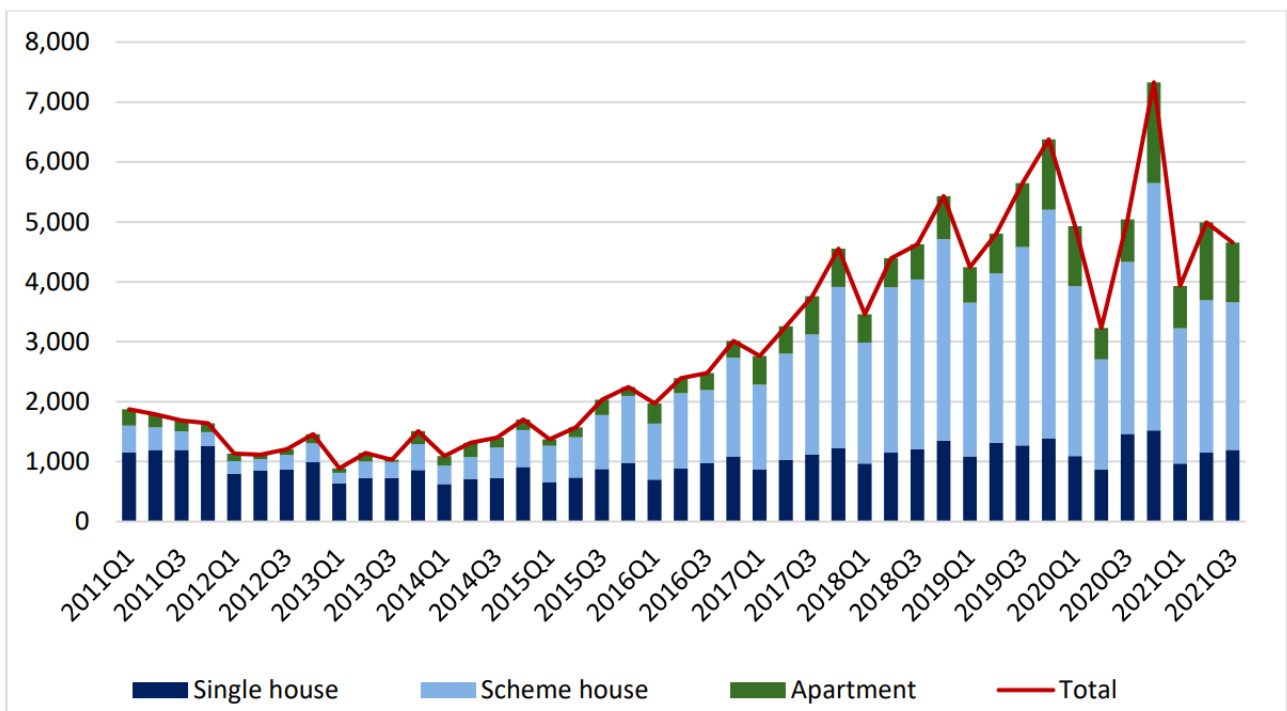
Recent trends show that population growth is set to continue in the wider Eastern and Midlands Region having regard to the Region’s young demographic profile and a return to net inward migration as the country returned to economic growth after a severe economic downturn from 2007. The level of in-migration to Ireland

experienced over the last two years was in the order of 30,000. This trend is set to continue due to the ongoing impacts of the Covid-19 pandemic.

While the number of residential units being completed yearly nationally has rebounded, the level of completions remains significantly less than the estimated equilibrium demand for housing in the State. Moreover, the current level of housing need and demand is not at equilibrium, being significantly augmented by the extremely low level of housing completions in the decade since 2010. Over this period, a significant shortfall in housing has amassed year on year, which is reflected in the data collected in Census 2016 – which revealed overcrowding and increasing numbers of households living in cramped conditions.

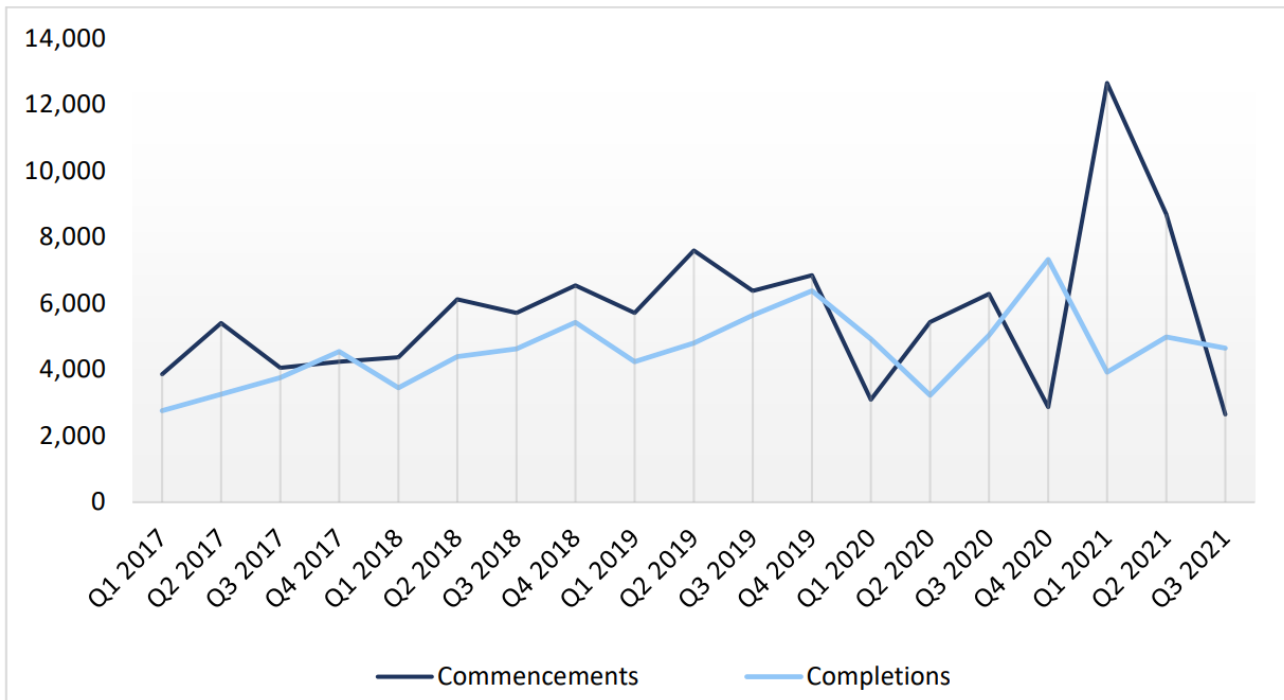
It is further noted that the number of housing completions in the state is reduced significantly in 2020, due to Covid-19, recovering well in 2021, with ESRI noting an expectation of close to 21,000-unit completions in 2021, with estimated growth of c. 26,000 units in 2022. This is dependent on the availability and costs of labour and materials which are contributing to a challenging industrial environment at present. While the level of house building has increased, it is still well below the target of c. 33,000 units per annum envisaged in Housing for All (2021).

Figure 3.5 – Yearly residential completions for the State (ESRI Quarterly Commentary Winter 2021)



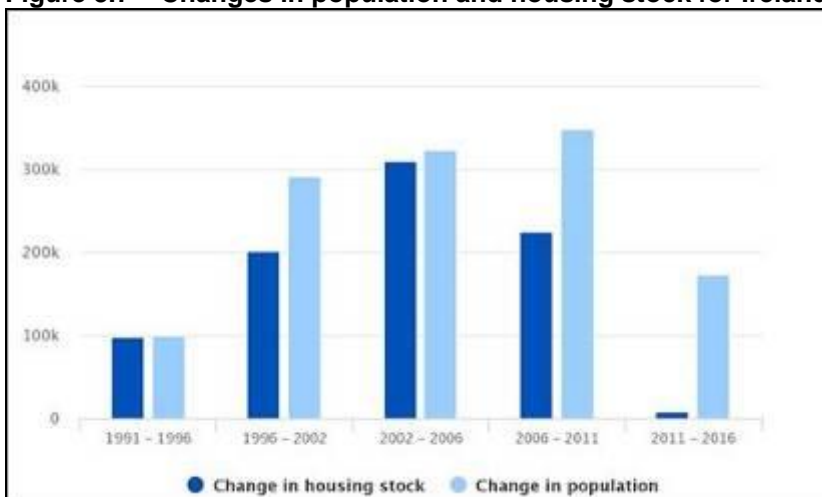
ESRI's Quarterly Commentary for Winter 2021 noted a marked decline in housing commencements in Q2 2020, rebounding strongly at Q1 2021 before falling thereon.

Figure 3.6 – Residential Commencements 2017-2021 (ESRI Quarterly Commentary Winter 2021)



Census 2016 revealed an increase in the national housing stock of just 8,800 units during the five-year intercensal period (taking into account obsolescence during that period) representing an increase of just 0.4 percent (as shown in the figure below). Whilst reducing the deficit somewhat in the five-year period to 2021, the next Census is expected to show an acute continued need for housing due to a rising population. Almost 40% of these additional units were one off houses, the majority of which would never have come to market. Census 2016 also revealed a rise in the average household size (from 2.73 to 2.75) (CSO, 2017). This was attributed to household formation falling behind population growth, another indicator of lacking housing availability and increasing housing need.

Figure 3.7 – Changes in population and housing stock for Ireland, 1991-2016

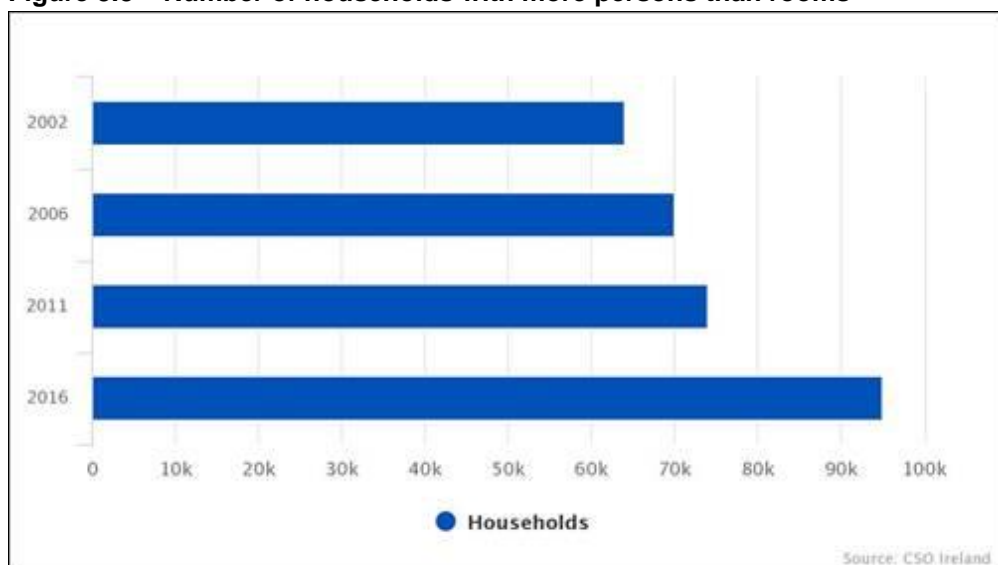


Source: Central Statistics Office, 2017

The 2011-2016 intercensal period also saw a notable increase in the number of households with more persons than rooms in their dwelling (see figure below). There were 95,013 permanent households with more persons than rooms according to Census 2016, a 28 per cent rise on the equivalent number in 2011 (73,997).

Close to 10 per cent of the population resided within these households in 2016 at an average of 4.7 persons per household. This is an indicator of increased overcrowding (and housing need) which may be attributed to lack of housing availability and rising costs.

Figure 3.8 – Number of households with more persons than rooms



Source: Central Statistics Office, 2017

These figures set out above all point to a significant and increasing housing need in the state which is not being met at present.

The Central Bank of Ireland has published a study in December 2019 entitled ‘Population Change and Housing Demand in Ireland’, which includes the following key points:

- “Growth in population has significantly exceeded the increase in the housing stock since 2011 and the average household size has risen, reversing a previous long-running trend.
- To keep pace with population growth and changes in household formation, our estimates indicate that an average of around 27,000 dwellings would have been required per annum between 2011 and 2019.
- Assuming unchanged household formation patterns and net inward migration close to current levels, around **34,000 new dwellings would be required each year until 2030.**”

3.3.6 Health & Safety

The surrounding context consists of a mix of residential, employment, retail and recreational 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.

3.3.7 Risk of Major Accidents and Disasters

The 2018 EIA Guidelines state that an EIAR must include the expected effects arising from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project. Recital 15 of the EIA Directive states that:

In order to ensure a high level of protection of the environment, precautionary actions need to be taken for certain projects which, because of their vulnerability to major accidents, and/or natural disasters (such as flooding, sea level rise, or earthquakes) are likely to have significant adverse effects on the environment. For such projects, it is important to consider their vulnerability (exposure and resilience) to major accidents and/or disasters, the risk of those accidents and/or disasters occurring and the implications for the likelihood of significant adverse effects on the environment. In order to avoid duplications, it should be possible to use any relevant information available and obtained through risk assessments carried out pursuant to Union legislation, such as Directive 2012/18/EU of the European Parliament and the Council¹ and Council Directive

2009/71/Euratom2, or through relevant assessments carried out pursuant to national legislation provided that the requirements of this Directive are met.

The 2017 EPA Draft Guidelines on the information to be contained in an EIAR refer to major accidents and/or disasters in a number of sections:

Characteristics of the Project – the draft guidelines state that the project characteristics should include “a description of the Risk of Accidents – having regard to substances or technologies used.”

Impact assessment - the draft guidelines state that the impact assessment should include “the risks to human health, cultural heritage or the environment (for example due to accidents or disasters)”.

Likelihood of Impacts - the draft guidelines state the following:

“To address unforeseen or unplanned effects the Directive further requires that the EIAR takes account of the vulnerability of the project to risk of major accidents and / or disasters relevant to the project concerned and that the EIAR therefore explicitly addresses this issue. The extent to which the effects of major accidents and / or disasters are examined in the EIAR should be guided by an assessment of the likelihood of their occurrence (risk). This may be supported by general risk assessment methods or by systematic risk assessments required under other regulations e.g. a COMAH assessment.”

The chapter identifies and assesses the likelihood and potential significant adverse impacts on the environment arising from the vulnerability of the proposed development to risks of major accidents and / or natural disasters. It considers whether the proposed development is likely to cause accidents and / or disasters and its vulnerability to them.

In this respect, taking cognisance of the other chapters contained within this EIAR document, it is not considered that the proposed development site or the existing context presents risks of major accidents or disasters, including external man made or natural disasters.

Standard construction practices will be employed throughout the construction phase. The subject lands are not proximate to or within the consultation zone for any Seveso/COMAH designated sites. The closest Seveso site is the Red Barns, Drumcar Road, Dunleer, Co. Louth, which is approximately 11 kilometres from the subject site. This places the subject site significantly outside the consultation zone for this Seveso site (600 metres).¹ Accordingly, it was concluded that the proposed development will *not* be located within the distance listed in column 2 of Table 2 of Schedule 8 to the Planning and Development Regulations 2001-2021 from an establishment of the corresponding type listed in column 1 of Table 2, or be located within such distance from a particular establishment as has been specified by the Health and Safety Authority in technical advice provided under article 7 of the Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 or would be in the vicinity of, or impact on, an establishment and be relevant to the risk or consequences of a major accident. As a result, reg. 300 of the Planning and Development Regulations, which applies in the case of major accident hazards from strategic housing developments, does not apply.

The majority of the site is location in Flood Zone C with the exception of lands to the east, located in Flood Zone A, as confirmed within the Site-Specific Flood Risk Assessment Report submitted with the application prepared by JBA Consulting Engineers. The North-Western Neagh Bann CFRAMS indicates that there is a risk of fluvial flooding in the eastern boundary of the site. The SSFRA notes no known risk of groundwater, pluvial or tidal flooding at the site. As set out within the Planning System and Flood Risk Management Guidelines 2009, lands within flood zone C are suitable for all types of land use including residential development which is classified as ‘highly vulnerable’ to flooding under the Guidelines.

The SSFRA sets out mitigation measures to flood risk on site including:

- Setting floor levels to the 1% AEP climate change water level, plus a freeboard allowance of at least 1.25m
- Finished floor levels providing a minimum of 150mm above surrounding ground levels
- All residential buildings located in Flood Zone C
- Design of part of the site in Flood Zone A/B as meadow as part of a riparian corridor

¹ See Table 2 in Schedule 8 to the Planning and Development Regulations 2001-2020.

- Stormwater system designed to manage surface water with attenuation tank designed to retain a 1 in 100-year flood event with a 20% allowance for climate

The SSFRA notes that the proposed strategy results in *'a small decrease in the peak flood flows downstream of the site and there are no negative impacts elsewhere'*. The mitigation measures included in the SSFRA ensures that the development proposal is in compliance with the core principles of the Planning System and Flood Risk Management Guidelines and has been subject to a commensurate assessment of risk.

The proposed development is not considered particularly vulnerable to major accidents and/ or disasters, and therefore the expected effects are considered to be negligible, as considered in greater detail at Section 3.5 below.

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 environment that could arise. In this chapter the potential impact on population and human health is assessed.

A full description of the proposed development is provided in Chapter 2 of this EIAR. In summary the proposed development consists of the following:

The proposed development comprises 272 no. residential units, a community building, a series of public open spaces, public park (c. 3.6 ha), a crèche and community building on a site of c. 13.03 hectares at Bridgewater, Ardee, Co. Louth. The 272 no. residential units proposed consist of 206 no. houses and 66 no. duplex units. The proposed childcare facility is a one and two storey building with a GFA of 484 sqm and a 165 sqm single storey community building. The proposed houses are 2 storeys in height and duplex blocks are 3 storeys in height. The proposal includes the realignment of the Rathgory Tributary which bisects the site on the east-west axis with a riparian corridor and area of public open space provided immediately adjacent to the watercourse.

The development includes associated site and infrastructural works including all associated road infrastructure, foul and surface / storm water drainage, surface water management and storage features, car parking spaces, public open space including a realigned watercourse and riparian corridor, a public park, bin and bike stores, substations, landscaping and boundary treatments and all ancillary works.

Based on current average household size projections, expected by the National Planning Framework to decline to 2.5 per household by 2040, a population of 680 may arise from the proposed development. This may be slightly greater in the short term, with a household size of 2.6 expected by the end of the current Louth CDP period to 2027 (Housing Strategy - Appendix 3 of CDP).

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, the European Commission, and the Department of Housing, Planning and Local Government 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.

For a more detailed assessment of potential impacts associated with other environmental factors, please refer to specific chapters of the EIAR which assess the environmental topics outlined in the EIA Directive.

3.5.2 Economic Activity

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 construction sector (including associated services) was documented as one of the most adversely impacted sectors of the Irish economy following the economic downturn in 2008 and Covid-19 downturn in 2020-21. The sector has recovered during 2021, however the emergence of new variants contributed to a 7.7% decline on residential completions in Q3 2021 and a 14% decline in housing (ESRI Quarterly Report Winter 2021), with commencements peaking in Q1. The construction of 272 no. residential dwellings, community building, childcare facility and all associated infrastructure will precipitate a positive impact on construction-related employment for the duration of the construction phase.

It is anticipated that up to c. 80 staff will be working at the site at all times during the construction period.

The construction phase will also have secondary and indirect 'spin-off' impacts on ancillary support services in the 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 beneficial impacts on economic activity 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 which consists of six phases and likely to span 4-5 years.

The proposed development could have a slight short term negative 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 Chapter 7 – Air Quality and Climate, Chapter 8 – Noise and Vibration, Chapter 10 – Traffic, Chapter 11 – Waste Management of the EIAR and in the Traffic and Transportation Assessment, Construction Management Plan, Construction and Environmental Management Plan and the Construction Waste Management Plan which accompany the application. These issues are mitigated further due to the location of the site away from a public road which will result in a lower level of disturbance.

Operational Phase

The operational phase of the proposed development will result in the provision of 272 no. residential units, community building and a childcare facility, public associated open space and public park. This will provide accommodation for approximately 748 persons, based upon an estimated occupancy rate of c. 2.75 persons per unit. This population may be lower in reality owing to a projected decrease in average household size as noted by the National Planning Framework which expects this average figure to reach 2.5 by 2040. 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. The development will provide much needed residential accommodation at an accessible location in Ardee in accordance with the projected growth targets for the County set out in the Regional Spatial & Economic Strategy for the Eastern & Midland Region and will contribute to achieving National Strategy Outcomes of the National Planning Framework.

3.5.3 Social Patterns

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 population may arise from construction activity. However, these impacts are imperceptible, temporary in nature and therefore not considered significant.

Such impacts will be short term, and in the longer term the completed scheme will have beneficial impacts for local businesses, residents and the wider community. Any disturbance is predicted to be commensurate with the normal disturbance associated with the construction industry where a site is efficiently, sensitively 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 Management Plan and Construction and Environmental Management Plan has been prepared and is submitted with this planning application.

Operational Phase

The addition of new residents to the area will improve the vibrancy and vitality of the area and will help to support existing community and social infrastructure. The subject lands will be accessed from Bridgewater to the

northwest (permitted under Reg. Ref.: 10174), with a pedestrian and bicycle path extending to the northern perimeter at Hale Street. The proposal makes provision for a future potential link to Cherrybrook to the west. As set out within the Statement of Consistency and Planning Report and the Socio-Economic & Housing Supply Report submitted with this application, there is a considerable range of existing and planned community and social infrastructure in close proximity to the site in the settlement of Ardee and this part of County Louth which the proposed development can avail of. The proposed development will provide new homes, including a range of family dwelling types and sizes, in this area of the County, which will help cater for the considerable unmet demand in the area.

Based on current average household size projections, expected by the National Planning Framework to decline to 2.5 per household by 2040, a population of 680 may arise from the proposed development. This may be slightly greater in the short term, with a household size of 2.6 expected by the end of the current Louth CDP period to 2027 (Housing Strategy - Appendix 3 of CDP).

The proposed development includes elements of key public infrastructure in the form of a c. 3.6 ha public park located in the northern part of the site and the provision of a road infrastructure by the extension of Bridgegate Avenue to meet the eastern boundary of the site. These features of the development are provided in accordance with the site's land use zoning objective, Spot Objective 4 and Objective SS 42 of the Louth CDP 2021-2027. In this respect, the proposal will have social benefits to the growth and functionality of Ardee in terms of recreational spaces and mobility. The development is considered to have a positive impact on the growth of Ardee. Please refer to the accompanying Socio Economic & Housing Supply Assessment for further details.

3.5.4 Land-Use & Settlement Patterns

Construction Phase

The construction phase of the proposed development will primarily consist of site clearing, excavation and construction works, and has the potential to impact adversely and result in the temporary degradation of the local visual environment on a short-term basis. The proposal includes the realignment of the Rathgory Tributary which will be applied for under a separate Section 9 and Section 50 applications, as detailed within Chapter 6 – Water and the accompanying Site-Specific Flood Risk Assessment (SSFRA) by JBA Consulting. The visual impacts precipitated by the proposed development are assessed in greater detail in Chapter 9 – Landscape.

Secondary land use impacts include off-site quarry activity and appropriate disposal sites for removed soil. Construction works are likely to take place on a phased basis, which will moderate the potential impacts on adjoining land use. The Construction Management Plan (CS Consulting), Construction and Environmental Management Plan (Altamar) and Construction & Demolition Waste Management Plan (AWN Consulting) addresses these issues in more detail.

The construction 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.

Operational Phase

The operational phase of the proposed development will result in the introduction of a residential land use to the subject site which will provide housing for the growing population of the immediate area and the Eastern and Midlands Region in general. In addition, a significant quantity of open space consisting of recreational and amenity space is also provided in addition to the childcare facility and community building, as well as a c. 3.6 ha public park. The proposal is considered as a logical extension of the settlement of Ardee and is consistent with the principles and land use zoning objective for the site and the Louth CDP 2021-2027. The proposed development is considered a positive impact on land use through provision of housing for the growing population and through improving amenities.

3.5.5 Employment

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

3.5.6 Housing

Construction Phase

The proposed development will not result in any impact in terms of loss of housing stock during the construction stage as workers are anticipated to travel to the construction site rather than staying locally.

Operational Phase

The operational phase of the proposed development will see the delivery of 272 residential units, in a range of housing typologies comprising semi-detached, terraced and duplex apartment units. The proposed development will respond to established housing need and demand in the area of the proposed development, and the wider region. The proposed residential units will assist in addressing the significant shortfall of residential development, which has been further impacted by the Covid-19 pandemic.

The proposed development delivers a range of housing unit sizes and types, including two, three and four bedroom houses as well as 1, 2 and 3 bedroom duplex apartment units. The scheme also benefits from a high level of good quality public open space, with new linkages provided through the site and a c. 3.6 ha public park in the northern part of the site which will combine with the permitted park to the west to form a c. 7.2 ha park at Bridgegate. The features of the development will have a direct, positive, and significant impact on the future residents of the proposed development and the wider community of Ardee and its surrounding areas as well as supporting population growth targeted for Ardee and the Eastern and Midlands Region as a whole.

3.5.7 Health & Safety

Chapter 14 – Risk Management prepared by Arkmount addresses health and safety. No significant health and safety effects are envisaged during either the construction or operational phases of the proposed development. The 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.

Construction Phase

The construction phase of the proposed development may give rise to short-term impacts associated with construction traffic, migration of surface contaminants, dust, noise and littering. Secondary impacts may include increased traffic arising from hauling building materials to and from the proposed development site which are likely to affect population and human health distant from the proposed development site, including adjacent to aggregate sources and landfill sites. These impacts are considered to be mitigated owing to the site's location away from any public roads.

Construction impacts are likely to be short term and are dealt with separately in the relevant chapters of this EIAR document and will be subject to control through a Construction and Environmental Management Plan an outline Construction Management Plan is submitted herewith. The construction methods employed, and the hours of construction 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 have been omitted from the design so that the impact on the construction phase will be reduced.

Operational Phase

The operational stage of the development is unlikely to precipitate any significant 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 paths, roadways and public areas have all been designed in accordance with best practice and the applicable guidelines including DMURS and relevant Building Regulations. Likewise, the proposed residential units and community facilities accord with the relevant guidelines and will meet all relevant safety and building standards and regulations, ensuring a development which promotes a high standard of health and safety for all occupants and visitors. A SSFRA has been undertaken by JBA Consulting and accompanies this submission. This notes no adverse impacts arising from the development in respect of flood risk, with runoff to the Rathgory Tributary reducing as a result of the proposal with a positive effect on the water environment.

The proposed development will not result in any significant impacts on human health and safety once completed and operational.

3.5.8 Risk of Major Accidents or Disasters

Construction Phase

Standard construction practices will be employed throughout the construction phase as outlined in the accompanying outline Construction Management Plan prepared by CS Consulting Engineers and the Construction & Environmental Management Plan prepared by Altamar with mitigation measures set out in this EIAR. The subject lands are not proximate to any Seveso/COMAH designated sites, the nearest site being c. 11 kilometres away, the development falling well outside the nearest zone of notification.

As detailed within the accompanying Site-Specific Flood Risk Assessment prepared by JBA Consulting, the Eastern Catchment Flood Risk Assessment and Management Study (ECFRAMS) and the Irish Coastal Protection Strategy Study (ICPSS) indicates that the majority of the subject site is within Flood Zone C, with a low probability of flooding. A small area of the site is located in Flood Zone B adjacent to the eastern perimeter.

Hazardous materials used during construction will be appropriately stored so as not to give rise to a risk of pollution. In the event of storms or snow, construction activity can be halted, and the site secured. Refer to CS Consulting Outline Construction Management Plan and Construction Environmental Management Plan prepared by Altamar for further details.

The Construction Environmental Management Plan, as well as good housekeeping practices will limit the risk of accidents during construction. Fire safety will be dealt with under the Fire Safety Code at design and construction stage.

Operational Stage

The proposed development is not considered particularly vulnerable to major accidents and/or disasters, and therefore the expected effects are considered to be negligible. This is addressed in Chapter 14 – Risk Management prepared by Arkmount Construction.

The subject lands are not proximate to any Seveso/COMAH designated sites, the nearest site being c. 11 kilometres away, the development falling well outside the nearest zone of notification.

The ECFRAMS and ICPSS indicates that the subject site is within Flood Zone C, with a low probability of flooding. A small area of the site is located in Flood Zone A/B adjacent to the eastern perimeter with and maintained as landscaped open space in the proposal. A SSFRA prepared by JBA Consulting accompanies this submission and includes mitigation measures which ensure that the development proposal is in compliance with the core principles of the Planning System and Flood Risk Management Guidelines and has been subject to a commensurate assessment of risk.

3.5.9 Water

Construction Phase

As detailed within Chapter 6 – Water, prepared by CS Consulting, the 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 insignificant.

During the course of the construction phase of the proposed development, there is potential, in the absence of mitigation, for weathering and erosion of topsoil and surface soils. Other water runoff could also result in an increased level of silt or other pollutants. A number of mitigation measures are outlined in Chapter 6 (Water) 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.

Operational Phase

The impact of the operational phase of the proposed development on the public water supply will increase the demand on the existing supply. The estimated average daily water demand for the proposed development would be c. 1.3 litres per second as set out within the Engineering Services Report prepared by CS Consulting Engineers.

The existing wastewater network will require upgrades to cater for the additional proposed load. The upgrade will involve upsizing of between 300 and 1000 meters of existing 225mm sewer along the public road. 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'.

The proposed development will require a new separate drainage network to collect and convey the effluent generated by the proposed development. The drainage network for the proposed development has been designed in accordance with the Regional Code of Practice Drainage Works, the Greater Dublin Strategic Drainage Study (GDSDS) and Irish Water Code of Practice for Wastewater Infrastructure.

As set out within the infrastructure design report prepared by CS Consulting Engineers, surface water runoff from the proposed residential development will be attenuated to Qbar in accordance with the recommendations of the GDSDS, with surface water runoff exceeding the allowable outflow rate stored for up to a 1% AEP (Annual Event Probability) rainfall event. Surface water storage will be provided in an underground storage system, such as 'Stormtech' or similar approved systems discharging to the Rathgory Tributary and public network.

Primary SuDS features proposed for the management of surface water runoff from the subject site include low-water usage sanitary appliances, water-butts and permeable paving which operate under normal rainfall events. These features encourage groundwater recharge and are sympathetic to the environment. They provide storage that not only attenuates the flow but also permits settlement of coarse silts, with plants in the water to promote settlement. Runoff would also be treated by adsorption of particles by aquatic vegetation or by soil, and by biological activity.

The proposals for potable, waste, and surface water on within the proposed development will ensure effective management of water within the scheme. The potential impact on population and human health as a result of the elements of the development associated with water and water infrastructure is therefore considered to be negligible for the operational phase of the development.

3.5.10 Noise & Vibration

Construction Phase

As detailed within Chapter 8 prepared by Awn Consulting, during the construction phase of the project there will be a short-term noise impact on nearby noise sensitive properties from site activities in proximity to Noise Sensitive Locations (NSLs). The application of binding noise limits, hours of operation, along with implementation of appropriate noise and vibration control measures will ensure that noise and vibration impacts are kept to a minimum in so far as practicable.

The likely noise effects during the construction phase at nearby NSLs can be described as Negative, Moderate and Short-term. The above effects should be considered in terms that the effect is variable, and that this assessment considers the locations of the greatest potential impact.

The likely residual vibration effects during the construction phase at nearby sensitive locations can be described as neutral, imperceptible, and short-term.

The implementation of the construction phase noise and vibration mitigation measures and a routine noise monitoring programme as detailed in Chapter 8 of the EIAR, will minimise the potential noise and vibration impact on the receiving environment including existing residential receptors, thereby ensuring that there will be no significant population or human health impacts associated with noise from the construction phase of the development.

Operational Phase

As detailed within Chapter 8 prepared by AWN Consulting, the change in noise levels along all routes in the existing road network associated with additional traffic from the proposed development is predicted to be less than 1 dB. The likely effect can be described as negative, imperceptible and long-term.

The proposed development will have acceptable internal noise levels, having regard to design measures to be implemented as noted in Chapter 8 of this EIAR. Due to the nature of the proposed development, no significant sources of noise and vibration are expected to arise during the operational phase.

Having regard to the above, it is considered that there will be no significant population or human health impacts associated with noise during the operational phase of the development.

3.5.11 Air Quality & Climate

Construction Phase

Various elements associated with the construction phase of the proposed development have the potential to impact local ambient air quality, however the potential construction phase impacts shall be mitigated as detailed in Chapter 7 (Air Quality and Climate) of this EIAR prepared by AWN Consulting to ensure there is a minimal impact on ambient air quality for the duration of all construction phase works. A programme of dust monitoring will be implemented throughout the construction phase to assess compliance with the air quality limits and to ensure local residents, workers, property and amenities are not adversely impacted by construction related dust emissions. The impact of construction of the proposed development is likely to be negative, short-term, localised and imperceptible with respect to human health.

Operational Phase

As noted in Chapter 7 of this EIAR prepared by AWN Consulting, it is predicted that the operational phase of the development will not directly or indirectly generate air emissions that would have any significant adverse impact on local ambient air quality. Air dispersion modelling of operational traffic emissions was undertaken to assess the impact of the development with reference to EU ambient air quality standards which are based on the protection of human health. As demonstrated by the modelling results, emissions arising from the proposed development are significantly below the ambient air quality standards which are based on the protection of human health. Impacts to human health are long-term, negative and imperceptible.

In order to minimise the impact of the development on the global climate, initiatives such as solar photovoltaic panels will be installed on the roofs of all units and community buildings to minimise the consumption of fossil fuel derived electricity. The residential units will be designed to be thermally efficient and be Nearly Zero Energy Buildings (NZEB) consistent with current Regulations. The modelling assessment determined that the change in emissions of NO₂ at nearby sensitive receptors as a result of the proposed development will be imperceptible. Therefore, the operational phase impact to air quality is long-term, localised, negative and imperceptible.

3.5.12 Landscape and Visual Impact

Construction Phase

As detailed within Chapter 9 of the EIAR prepared by Stephen Diamond Associates, the change from a primarily agricultural landscape to that of a mixed housing development will result in a material change in the landscape character of the site. The creation of new housing and ancillary facilities are the most visually negative in the early stages of development but as the project completes and the planting establishes and develops the negative visual impacts are lessened.

The construction phase will have short term landscape and visual impacts. The impacts are not considered significant on population and human health, particularly given the level of screening to site boundaries and the similar nature of the proposed development to its immediate neighbouring residential use.

Operational Phase

As detailed within Chapter 9 of the EIAR prepared by Stephen Diamond Associates, the site is zoned for residential development and a public park. It is an objective of the Louth CDP 2021-2027 to protect views of

Mulladrillen Hill. The proposed development is consistent with the zoning and existing and established and emerging character and land use of the surrounding area. The visual impact of the proposed development on the surrounding area is considered to be minimal, with the implementation of the public park at Mulladrillen Hill with no impacts upon protected views arising. No significant amenity, landscape or visual effects are likely to arise from the proposed development.

The proposed development will have a positive impact on the landscape setting of the area through the implementation of a linear park and riparian corridor at the Rathgory Tributary to the south of the c. 3.6 ha Mulladrillen Hill Park.

Please refer to Chapter 9 - Landscape and Visual Impact (prepared by SDA) and the accompanying photomontages for a more detailed assessment.

3.5.13 Waste Management

The management of all wastes associated with both the construction and operational phases of the development is a principal sustainable aspect of the development. A site-specific Construction & Demolition Waste Management Plan and Operational Waste Management Plan have been prepared by AWN to provide the required waste management infrastructure to minimise the generation of un-segregated domestic waste and maximise the potential for segregating and recycling domestic waste fractions to comply with waste reduction and recycling targets defined in *The Eastern-Midlands Region Waste Management Plan 2015-2021*.

The development will be designed to provide 3-bin domestic waste storage within each residential unit which will promote and encourage the principal of waste segregation at source, with central bin storage areas provided for duplex units. Communal waste bin storage areas shall be designed in a manner to ensure clean, safe, and mobility impaired accessible facilities for the residents of the apartments.

The potential impacts on human beings in relation to the generation of waste during the construction and operational phases are that incorrect management of waste could result in littering which could cause a nuisance to the public and attract vermin. A carefully planned approach to waste management and adherence to the project specific C&DWMP and OWMP, will ensure appropriate management of waste and avoid any negative impacts on the local population. The effects will be long-term, imperceptible and neutral.

3.5.14 'Do Nothing' Scenario

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'* impact would result in the subject lands remaining in a greenfield state and undeveloped. This would be an underutilisation of the site from a sustainable planning and development perspective, particularly considering the location of the lands and their zoning for residential and community facilities with areas of public green space. The status of the environmental receptors described throughout this EIAR document would be likely to remain 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 change from the baseline scenario in relation to population (human beings) and human health based on ongoing trends observed in the surrounding area and the national context.

However, similarly the potential for any likely and significant positive environmental impacts arising from both the construction and operational phases of the proposed development would also not arise. The site is zoned for residential development in the Louth CDP 2021-2027 and the proposed use of the site is considered to be in accordance with the proper planning and sustainable development of the area.

A *'do nothing'* scenario would involve the subject site, which is zoned for residential with an objective to provide a public park, remaining in its current predominantly greenfield state, and remaining underutilised.

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

Failure to deliver the proposed residential units would result in existing housing need and demand remaining unmet. The community building, public park, childcare facility, and public open spaces to be provided in the development and serving the wider area would also not be provided, with future links through the site connecting to lands to the east remaining incomplete.

3.6 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.

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 the remedial and mitigation measures proposed as a result of this EIAR.

POP & HH CONST 1:

In order to protect the amenities enjoyed by nearby residents, premises and employees a Construction Management Plan (including traffic management) shall be submitted by the contractor and implemented during the construction phase. A detailed Construction & Environmental Management Plan will also be prepared and be submitted by the contractor and implemented during the construction phase. The CMP and CEMP will incorporate the relevant mitigation measures outlined in this EIAR.

With reference to the construction phase of the proposed development, the objective of the Construction and Operational Waste Management Plan prepared by AWN are 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. The mitigation relating to the Construction and Demolition Waste Management Plan is summarised in Chapter 11 of the EIAR and detailed further in Appendix 11.1.

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 are away from the public road in a controlled environment. The objective of which is to minimise the short-term disruption to local residents, and reduce the potential for accidents.

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 natural disasters (e.g. flooding), the proposed development has undergone a SSFRA, prepared by JBA Consulting Engineers. The main area of the site where development is proposed is not at risk of fluvial, pluvial or groundwater flooding.

Operational Phase

The operation phase is considered to have likely positive impacts on human beings in relation to the provision of additional residential units, community facilities, and high-quality open space, pedestrian/cyclist facilities and bus stop to cater for the demands of a growing population and encourage active travel modes in accordance with the principles of sustainable development and residential zoning objectives pertaining to the site. Internal road layout design has been informed by and developed in accordance with the principles of DMURS in order to ensure a safe and pedestrian friendly environment which will help to mitigate risk of accidents.

3.7 PREDICTED RESIDUAL 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 EIA and project design processes through the assessment of alternatives described in Chapter 2 of this EIAR document.

Construction Phase

The construction phase of the proposed development will primarily consist of site clearance, excavation and construction works, which are likely to take place over the 7-year duration of the planning permission which is sought, which will be largely confined to the proposed development site. 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.

It is anticipated that subject to the careful implementation of the remedial and mitigation measures proposed throughout this EIAR document any adverse likely and significant population and human health impacts will be avoided. Positive impacts are likely to arise due to an increase in employment and economic activity associated with the construction of the proposed development. As outlined above, the construction phase will have both direct and secondary positive economic impacts in this regard.

The overall predicted likely and significant impact of the construction phase will be short-term, temporary and likely to be neutral.

Operational Phase

The proposed development will result in a positive alteration to the existing undeveloped site in terms of the provision of residential units, community building and a childcare facility to serve the overall development at Bridgewater, as well as a c. 3.6 ha public park (as part of a wider c. 7.2 ha park) in the northern part of the site with pedestrian links provided to Hale Street at the northeast perimeter.

Positive impacts on population and human health will include health benefits associated with the provision of a significant quantity of open space, a highly permeable layout which encourages walking and cycling, amenity and recreational facilities as well as facilitating a future connector link road to Jumping Church Road / Black Road in accordance with Objective SS 42 of the Louth CDP through the extension of Bridgewater Avenue to the eastern perimeter.

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.

3.8 MONITORING

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

3.9 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.

3.10 INTERACTIONS

As noted above, there are numerous inter-related environmental topics described in detail throughout this EIAR document which are of relevance to human health. This chapter of the EIAR has been instructed by updated

guidance documents reflecting the changes within the 2014 EIA Directive. These documents include the Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018) and the Draft Guidelines on the information to be contained in environmental impact assessment reports, published by the EPA in August 2017. Therefore, in line with the guidance documents referred to, this chapter of the EIAR focuses primarily on the potential likely and significant impact on Population and Human Health in relation to health effects/issues and environmental hazards from the other environmental factors and interactions that potentially may occur.

The main high-level interactions between Population and Human Health and other environmental factors include Transportation, Air and Climate, Water, Noise and Vibration, Landscape & Visual Impact and Waste Management.

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. However, the reader is directed to the relevant environmental topic chapter of this EIAR document for a more detailed assessment.

3.11 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. In this regard, existing and permitted developments in the vicinity have been reviewed which could have a cumulative impact along with the current proposal in terms of population and human health. These include the parent permission at Phase 1-3 of Bridgewater (permitted under Louth County Council Reg. Ref.: 10174; ABP Ref: PL15.238053 amended under permissions Reg. Refs.: 19336, 19353, 19549, 19875 and 211475) (under construction to the west) for 155 no. residential units, community building, crèche and public park.

The construction of the sewerage/water supply connections along the public road (N2) by Irish Water to facilitate the proposed development will require works to the public road will likely entail some localised impacts to residents.

It is anticipated will be carried out under exemption development and with a road opening licence under Section 254 of the Planning and Development Acts 2000 (as amended) required from Louth County Council. As part of the road opening licence, it is anticipated that a Construction Traffic Management Plan would be agreed with Louth County Council, by the contractor. The objective of which is to minimise the short-term disruption to local residents.

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.

The proposed development overlaps the boundary of the parent permission at the western boundary and will supersede granted development in this area which consists of 31 no. dwellings, crèche and community building and public open space. This will equate to a total of 396 no. dwellings in the overall Bridgewater development upon completion.

It is envisaged that the proposed development would accommodate a population of c. 742 persons, based on an average household size of 2.75 as set out in the National Planning Framework. However, this is projected to decline to 2.5 by 2040, resulting in an estimated population of c. 673. Taken cumulatively alongside Phases 1-3, the potential population arising from the 396-unit development may be c. 1,089, decreasing to 990 when calculated with an average household size of 2.5. The proposed crèche extends to 484 sqm and has been designed to accommodate the anticipated childcare need arising from the overall Bridgewater development.

Based on an average primary school-going age cohort of 12% of the population (per the Department of Education methodology for calculating school demand), the additional primary school-going population arising from the proposed development would be c. 90 no children. The number of secondary school-going residents within the proposed development is likely to be c. 63, based on a secondary school attendance rate of 8.5% of the population on average, decreasing to c. 58 at 2040 levels.

The population of Ardee settlement, per the 2016 census was 4,919 (an increase of 365 over the 2011-2016 intercensal period) with a likely primary school-going age cohort of c. 590 no. children and a secondary school-going cohort of c. 418 no. children (based on the above referenced average percentages). Based on the comparatively small overall difference in school-going numbers that will be precipitated by the proposal, it is considered reasonable to assume that the school-going population from the proposed development and other permitted developments in the vicinity could be accommodated within the existing school infrastructure, and planned and permitted school infrastructure in the immediate vicinity, particularly the expansion of Scoil Mhuire Na Trocaire and Ardee Educate Together located adjacent to the subject site to the north and the Ardee Community School to the west of Ardee the town centre. Existing and currently expanding school capacity is considered sufficient to cater for the proposed development as set out in the accompanying School Demand & Concentration Report.

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. The greenfield lands will provide for 272 no. new residential units across a variety of unit and tenure types. This will have a moderate impact on the population (human beings) in the area when considered in the context of other developments in the area. This impact is likely to be long term and positive, having regard to the zoning objective for the subject lands, and their strategic location within the electoral division of Ardee Urban, which is designated for growth, the accessibility of the subject site from the town centre of Ardee, and the high level of demand for new housing in the area.

With regard to human health, the cumulative impact of the proposed development in conjunction with other nearby developments will provide for the introduction of a high-quality new neighbourhood in the area with a high level of accessibility and amenity, with a significant public park extending to c. 3.6 ha proposed, combining with that at Phases 1-3 to provide a facility in excess of c. 7.2 ha. The overall cumulative impact of the proposed development will therefore be long term and positive with regard to human health, as residents will benefit from a high quality, visually attractive living environment, with high quality opportunities for active and passive recreation and strong links and pedestrian permeability. This is consolidated by the conclusions of Dr. Martin Hogan's Health Assessment which notes that *'there will be increased level of amenity and opportunities for exercise due to the provision of a community building and open public spaces in the proposed development. This would be associated with some positive human health impacts. Some positive psychological effects for those who will have a new home are predicted'*. Please refer to Appendix 3.1 for details.

3.12 DIFFICULTIES ENCOUNTERED IN COMPILING

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

4.0 BIODIVERSITY

4.1 INTRODUCTION

This chapter of the EIAR has been prepared by Bryan Deegan of Altemar Limited. Altemar Ltd. is an established environmental consultancy that is based in Greystones, Co. Wicklow that has been in operating in Ireland since 2001. Bryan Deegan MCIEEM is the Managing Director of Altemar Ltd. and holds a M.Sc. Environmental Science, BSc (Hons.) in Applied Marine Biology and a National Diploma in Applied Aquatic Science. He has over 26 years' experience as an environmental consultant in Ireland and was the ecologist for all aspects of this project. Previous projects where Altemar were the lead project ecologists include the Lidl Ireland GmbH regional distribution centres in Newbridge and Mullingar, 18 airside projects for the Dublin Airport Authority (DAA) at Dublin Airport and 7 fibre optic cable landfalls in Ireland including the New York to Killala cable project in 2015. He is a competent expert in accordance with the EIA Directive 2014/52/EU.

This chapter assesses the biodiversity value of the proposed development area and the potential impacts of the development on the ecology of the surrounding area and within the potential zone of influence (ZOI). Standard construction and operational phase control measures, in addition to monitoring measures are proposed, to minimise potential impacts of the proposed development and to improve the biodiversity potential of the proposed development site post construction.

The programme of work in relation to biodiversity assessment was designed to identify and describe the existing ecology of the area and detail designated sites, habitats or species of conservation interest that could potentially be impacted by the proposed development. It also assesses the significance of the likely impacts of the scheme on the biodiversity elements, and designs mitigation measures to alleviate identified impacts. Full details of all the mitigation measures and the phasing of the project are contained in Chapter 2 of the EIAR as well as Chapter 16 (Mitigation Summary) and the mitigation is also included in the accompanying Outline Construction Environmental Management Plan (CEMP).

A separate AA Screening/Natura Impact Statement, in accordance with the requirements of Article 6(3) of the EU Habitats Directive, has been produced to identify potential impacts of the development on Natura 2000 sites, Annex species or Annex habitats. It concludes that *"In a strict application of the precautionary principle, it has been concluded that significant effects on the Dundalk Bay SAC and Dundalk Bay SPA are likely from the proposed works in the absence of standard control or mitigation measures, primarily as a result of direct hydrological connection to the site via the Rathgory Tributary and River Dee and possible downstream impacts from the project during the in-stream, construction landscaping and drainage works. For this reason, a NIS was carried out to assess whether the proposed project, either alone or in combination with other plans or projects, in view of best scientific knowledge and in view of the sites conservation objectives, will adversely affect the integrity of the European Site. All other Natura 2000 sites were screened out at initial screening."*

Following the implementation of mitigation measures in relation to preventing downstream impacts from the proposed works *"that the project alone or in combination with other plans or projects will not have an adverse effect on the integrity of the Dundalk Bay SAC and Dundalk Bay SPA in view of their conservation objectives. No in combination effects are foreseen. In combination effects have been excluded."*

4.2 STUDY METHODOLOGY

A pre-survey biodiversity data search was carried out. This included examining records and data from the National Parks and Wildlife Service (NPWS), National Biological Data Centre (NBDC) and the Environmental Protection Agency (EPA), in addition to aerial, 6 inch maps and satellite imagery. This assessment was carried out in accordance with best practice methodology as per EPA 2017 Guidelines and EC Guidance on EIAR, The European Commission's "Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment" (2013) and the Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report, European Commission, 2017. A habitat survey of the site was undertaken within the appropriate seasonal timeframe for terrestrial fieldwork. Field surveys were carried out as outlined in Table 4.1. All surveys were carried out in the appropriate seasons with the exception of mammal surveys. However, site is open habitat and good access was possible to all areas on site additional mammal surveys were not deemed to be required due to the lack of features on site which would form resting or breeding places for mammals.

Table 4.1. Field Surveys

Area	Surveyors	Survey Dates
<i>Terrestrial Ecology</i>	Bryan Deegan (MCIEEM) of Altamar	23 rd July 2020 & 7 th June 2021
<i>Bat Fauna</i>	Bryan Deegan (MCIEEM) of Altamar	23 rd July 2020 & 7 th June 2021
<i>Aquatic Ecology</i>	Bryan Deegan (MCIEEM) of Altamar	23 rd July 2020 & 7 th June 2021
Wintering	Brian Keeley B.Sc. (Hons)	20, 28, November 2020 17, 29 December 2020 7, 21 January, 2020 10 February, 2020 1, 15, 29 March, 2020
Breeding birds	Brian Keeley B.Sc. (Hons)	4, 26 May 2021

Desk studies were carried out to obtain relevant existing biodiversity information within the Zone of Influence (ZOI). As outlined in CIEEM (2018) The ‘*zone of influence*’ for a project is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities. This is likely to extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries.’ Best Practice In line with best practice guidance an initial zone of influence be set at a radius of 2km for non-linear projects (IEA, 1995). However, there is a watercourse within the proposed development site and it is proposed to provide a fisheries compliant diversion as part of the proposed development. As a result, the potential ZOI extends beyond the site, with the potential for downstream impacts to extend the ZOI beyond the site outline via the watercourse. In relation to the ZOI as a result of the watercourse works this was extended to 15km. Beyond 15km the water from the watercourse enters the marine environment. Details of the proposed development are seen in Chapter 2 of the report. The proposed layout, drainage strategy and landscape design were reviewed to inform this assessment. Further, Chapter 2, Development Description, Chapter 5, Land and Soils and Chapter 6 Water of this submission were reviewed.

4.2.1 Proximity to designated conservation sites and habitats or species of conservation interest

The designated conservation sites within 15km of the site were examined for potential impact (Table 4-2a and 4-2b). Sites beyond 15km had no direct or indirect pathways as the watercourse enters the marine environment where dilution and mixing would occur within the Irish Sea. This assessment included sites of international importance; Natura 2000 sites (Special Areas of Conservation (SAC), Special Protection Areas (SPA)) and Ramsar sites and sites of National importance ((Natural Heritage Areas (NHA), proposed Natural Heritage Areas (pNHA)). Up to date GIS data (2020 NPWS data shapefiles) were acquired and plotted against 5, 10 and 15km buffers from the proposed development site. A data search of rare and threatened species within 10km of the proposed site (GIS shapefile) was provided by NPWS. Additional information on rare and threatened species was researched through the National Biodiversity Data Centre maps. Works are proposed to the watercourse on site and there is a direct hydrological pathway to Natura 2000 sites (Dundalk Bay SAC and Dundalk Bay SPA) via the River Dee. Therefore, an AA Screening/Natura Impact statement was carried out for the project and is included with the supporting documentation for this application.

4.2.2 Terrestrial and Avian Ecology

A pre-survey data search was carried out. This included a literature review to identify and collate relevant published information and ecological studies previously conducted and comprised of information from the following sources; the National Parks and Wildlife Service, NPWS Rare and Protected Species Database, National Biodiversity Data Centre, EPA WMS watercourses data, in addition to aerial, 6 inch, satellite imagery. Following the desktop study, walk-over assessments of the site were carried out on the 23rd July 2020 and on the 7th June 2021. Surveys were carried out by means of a thorough search within the potential ZOI. The presence of mammals is indicated principally by their signs, such as resting areas, feeding signs or droppings - though direct observations are also occasionally made. Habitat mapping was carried out according to Fossitt (2000) using ArcGIS 10.5 and displayed on Bing satellite imagery or street mapping. Any rare or protected species or habitats were noted. As part of the fieldwork an invasive species assessment was carried out. Wintering and breeding bird assessments were carried out by Brian Keely on the dates in Table 4.1 (Appendix 4.1). Birds noted on site were classed based on the Birds of Conservation Concern In Ireland classification of red, amber and green, which is based on an assessment of the conservation status of all regularly occurring birds on the island of Ireland.

4.2.3 Bat Fauna

Onsite trees were inspected for bats and/or their signs using a powerful torch (141 Lumens) – Petzl MYO RXP. The site survey was supplemented by a review of Bat Conservation Ireland’s (BCIreland) National Bat Records Database. A bat detector and emergent survey was carried out on the 23rd July 2020 and again on the 7th June 2021. A detector survey was carried out with a Batbox Duet is a dual-mode bat detector. Foraging activity of two bat species soprano pipistrelle (*Pipistrellus pygmaeus*) was noted along the southern side of the hedgerow that

bisects the site. A Leisler's bat. (*Nyctalus leisleri*) was noted at the eastern end of the watercourse foraging in the vicinity of the white willow (*Salix alba*). No foraging was noted in other areas of the site.

4.2.4 Rating of Effects

The terminology for rating impacts is derived from the EPA Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (2017).

4.2.5 Difficulties Encountered

No difficulties were encountered in relation to the preparation of the Biodiversity chapter. The bat survey was undertaken within the active bat period (April to September) and a detector survey was possible. Insects were observed in flight during the bat survey.

4.3 CONSULTATION

Consultation was carried out with the project team in relation to the preparation of the Landscape strategy and Construction Environmental Management Plan (CEMP). The proposed watercourse diversion strategy was discussed verbally with Michaela Kirrane, Senior Fisheries Environmental Officer, Inland Fisheries Ireland and included the development of a fisheries compliant biodiversity corridor.

4.4 THE EXISTING RECEIVING ENVIRONMENT (BASELINE SITUATION)

4.4.1 Zone of Influence

The potential ZOI of the project was deemed to be the site within the site outline with potential for downstream impacts on the Rathgory Tributary, River Dee and the Natura 2000 sites (Dundalk Bay SAC and Dundalk SPA) in the absence of standard construction phase controls or, mitigation measures. This site outline is shown in figure 4-1.

4.4.2 Designated sites

As can be seen from Figures 4-2 (SAC's within 15km), 4-3 (SPA's within 15km), 4-4 (NHA (none) and pNHA within 15km), 4.5 (Watercourses proximate to the site.), there are no Natura 2000 sites (SAC & SPA) within 5km and no National conservation sites within one kilometre of the proposed development site. However, it should be noted that Dundalk Bay (SAC, SPA and pNHA) are 12.1km downstream from the proposed works. The distance and details of the conservation sites within 15km of the proposed development are seen in Table 4.2a and Table 4-2b. In line with best practice guidance an initial zone of influence be set at a radius of 2km for non-linear projects (IEA, 1995). In relation to the ZOI as a result of the watercourse works this was extended to 15km. It is important to note that the nearest Natura 2000 site with a direct hydrological pathway downstream is a minimum of 12.1 Km within Dundalk Bay. Significant settlement, dilution and mixing would occur within the Rathgory Tributary and in the River Dee catchment prior to reaching these designated sites. However, mitigation measures will need to be in place to protect local biodiversity and to ensure compliance with Water Pollution Acts and that the proposed works do not impact on the integrity of designated sites.

Table 4-2a. Natura 2000 sites within 15km of the proposed development

NATURA 2000 Site	Distance	Direct Hydrological / Biodiversity Connection
Special Areas of Conservation		
Dundalk Bay SAC	12.1 Km	Yes
River Boyne and River Blackwater SAC	14.1 Km	No
Special Protection Area		
Stabannan-Braganstown SPA	5.1 Km	No
Dundalk Bay SPA	12.1 Km	Yes

Table 4-2b. National designated sites within 15km of the proposed development

Proposed Natural Heritage Area	Distance	Direct Hydrological / Biodiversity Connection
Kildemock Marsh	1.3 km	No
Louth Hall and Ardee Woods	1.6 km	No
Ardee Cutaway Bog	2.3 km	No
Stabannan-Braganstown	4.3 km	No
Mentrim Lough	5.2 km	No
Mellifont Abbey Woods	6.1 km	No
Corstown Loughs	6.4 km	No
Reaghstown Marsh	9.2 km	No
Darver Castle Woods	9.2 km	No
Barmeath Woods	11.6 km	No
Dundalk Bay	12.1 km	Yes
Ballyhoe Lough	12.5 km	No
Stephenstown Pond	13.2 km	No
King William's Glen	14.1 km	No



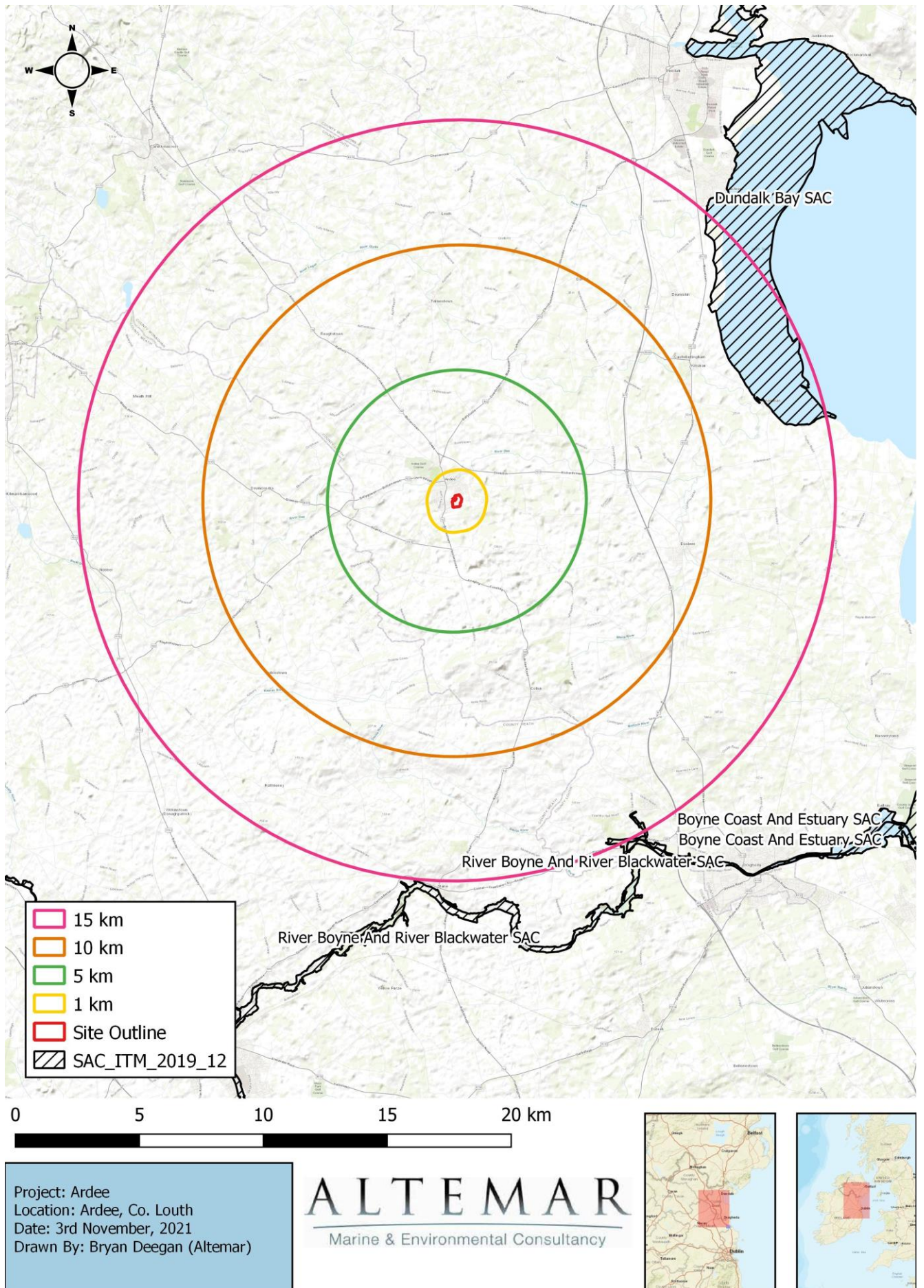


Figure 4.2 – Special Areas of Conservation within 15km.

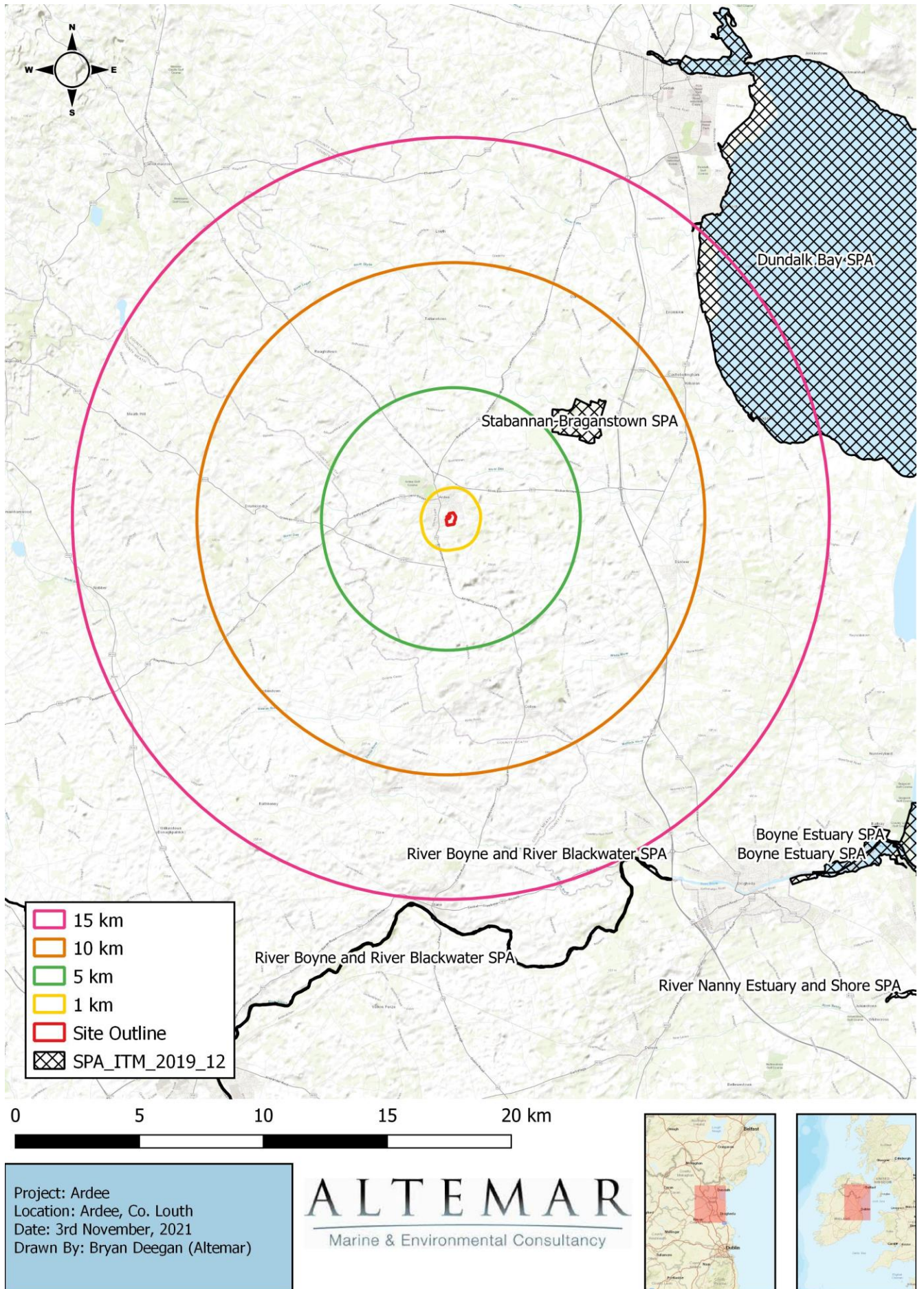


Figure 4.3– Special Protection Areas within 15km.

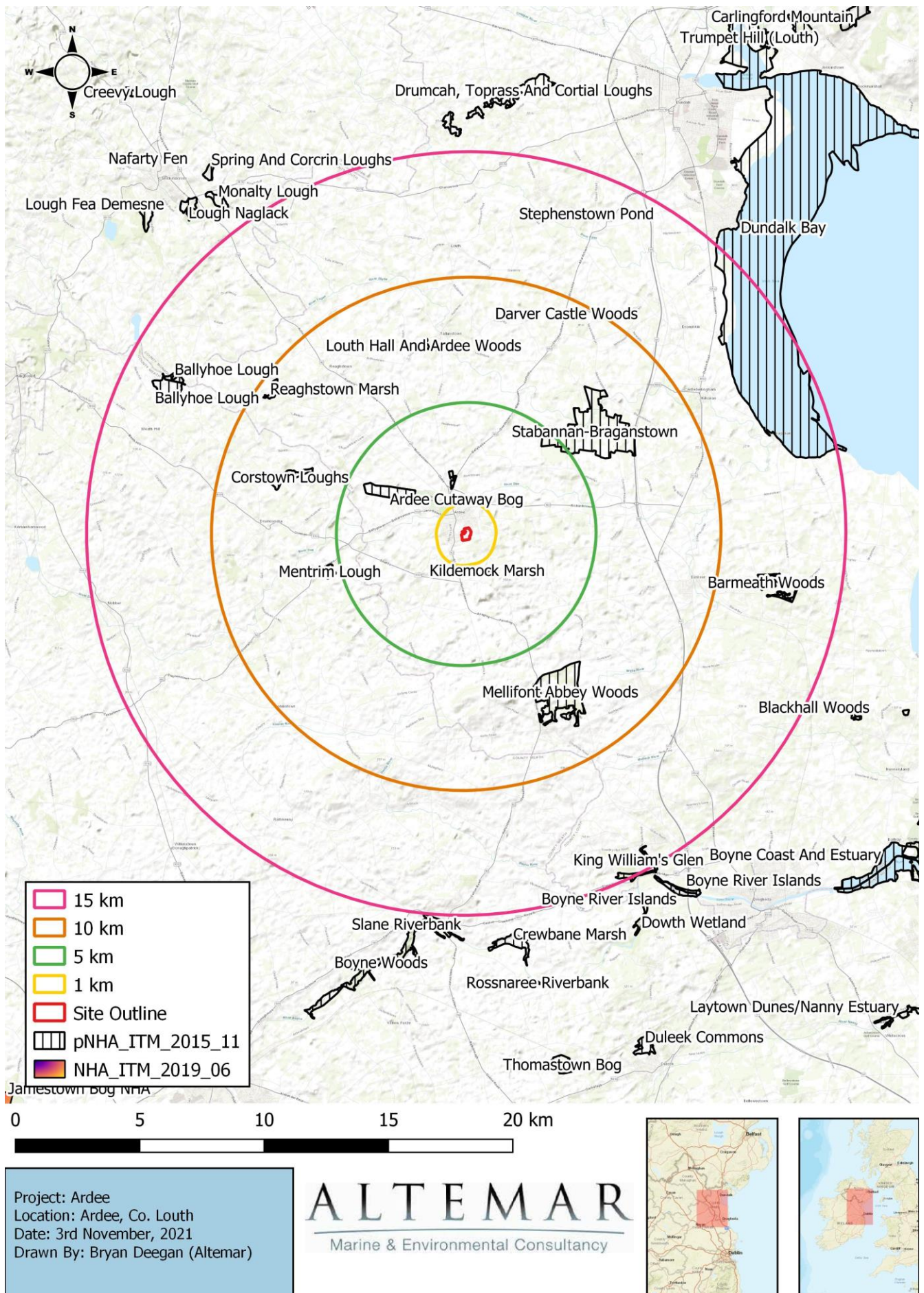


Figure 4.4 – Natural Heritage Areas (None) and proposed Natural Heritage Areas within 15km.

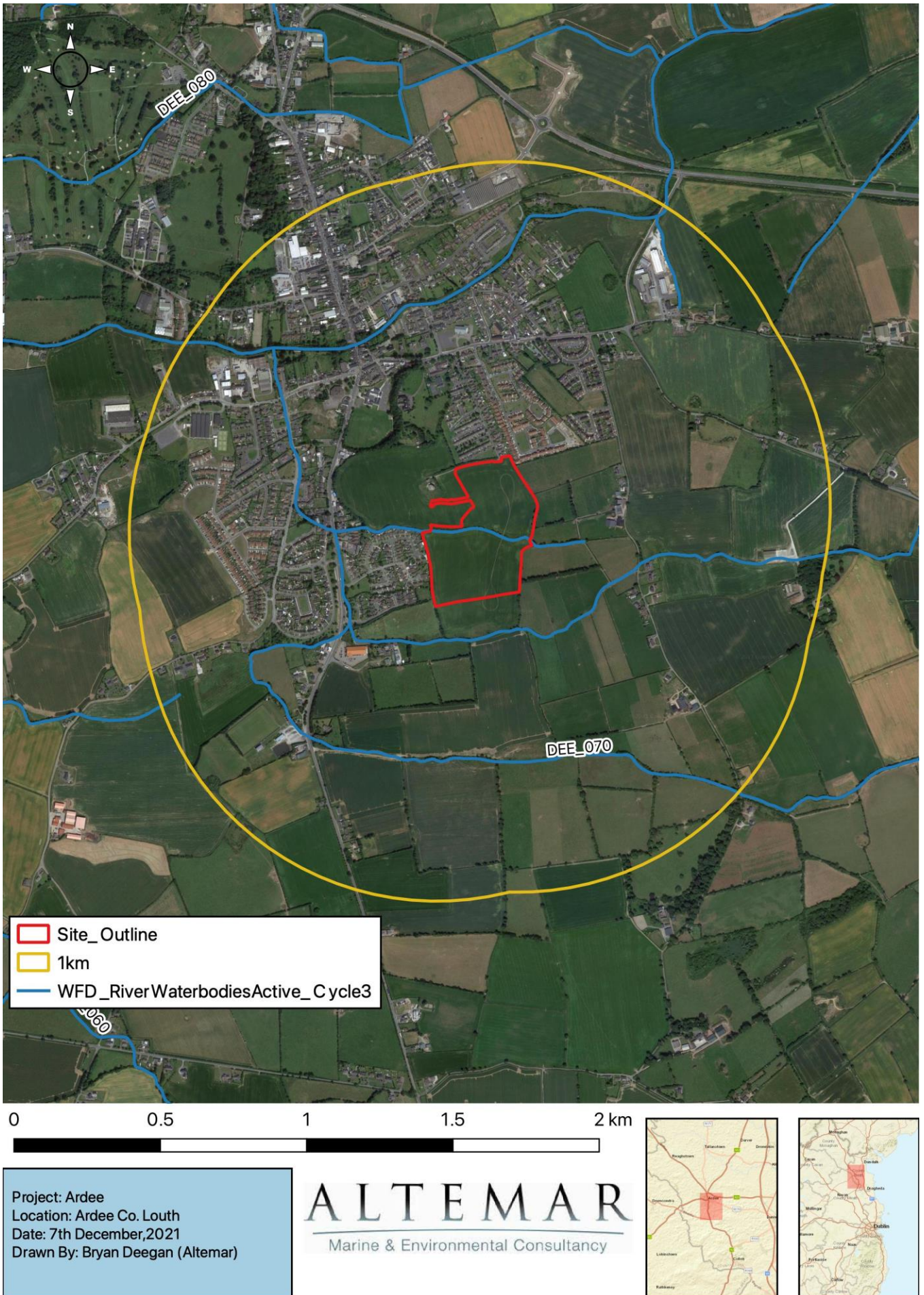


Figure 4.5 – Watercourses (watercourse in the site (Rathgory Tributary) is a tributary of the River Dee).

4.4.3 Species data.

It should be noted that no species of conservation importance were noted on site, based on NPWS and NBDC records as fine resolution. Species recorded within the 10km grid include are seen in Table 4.3.

Table 4.3. National Biodiversity Data Centre Records within the 10km² grid.

<p>Common Frog (<i>Rana temporaria</i>), Barn Owl (<i>Tyto alba</i>), Barn Swallow (<i>Hirundo rustica</i>), Black-headed Gull (<i>Larus ridibundus</i>), Common Coot (<i>Fulica atra</i>), Common Grasshopper Warbler (<i>Locustella naevia</i>), Common Kestrel (<i>Falco tinnunculus</i>), Common Kingfisher (<i>Alcedo atthis</i>), Common Linnet (<i>Carduelis cannabina</i>), Common Pheasant (<i>Phasianus colchicus</i>), Common Redshank (<i>Tringa totanus</i>), Common Sandpiper (<i>Actitis hypoleucos</i>), Common Snipe (<i>Gallinago gallinago</i>), Common Starling (<i>Sturnus vulgaris</i>), Common Swift (<i>Apus apus</i>), Common Tern (<i>Sterna hirundo</i>), Common Wood Pigeon (<i>Columba palumbus</i>), Corn Crake (<i>Crex crex</i>), Eurasian Curlew (<i>Numenius arquata</i>), Eurasian Teal (<i>Anas crecca</i>), Eurasian Tree Sparrow (<i>Passer montanus</i>), Eurasian Woodcock (<i>Scolopax rusticola</i>), European Golden Plover (<i>Pluvialis apricaria</i>), Great Cormorant (<i>Phalacrocorax carbo</i>), Great Crested Grebe (<i>Podiceps cristatus</i>), Grey Partridge (<i>Perdix perdix</i>), Grey Wagtail (<i>Motacilla cinerea</i>), Greylag Goose (<i>Anser anser</i>), House Martin (<i>Delichon urbicum</i>), House Sparrow (<i>Passer domesticus</i>), Jack Snipe (<i>Lymnocyptes minimus</i>), Little Grebe (<i>Tachybaptus ruficollis</i>), Mallard (<i>Anas platyrhynchos</i>), Merlin (<i>Falco columbarius</i>), Mew Gull (<i>Larus canus</i>), Mute Swan (<i>Cygnus olor</i>), Northern Lapwing (<i>Vanellus vanellus</i>), Sand Martin (<i>Riparia riparia</i>), Sky Lark (<i>Alauda arvensis</i>), Spotted Flycatcher (<i>Muscicapa striata</i>), Stock Pigeon (<i>Columba oenas</i>), Yellowhammer (<i>Emberiza citrinella</i>), Canadian Waterweed (<i>Elodea canadensis</i>) (Invasive), Sycamore (<i>Acer pseudoplatanus</i>), Dotted Hornwort (<i>Anthoceros punctatus</i>), Field Hornwort (<i>Anthoceros agrestis</i>), Smooth Hornwort (<i>Phaeoceros laevis</i>), Wall (<i>Lasiommata megera</i>), Halictus (<i>Seladonia</i>) <i>tumulorum</i>, Large Red Tailed Bumble Bee (<i>Bombus (Melanobombus) lapidarius</i>), <i>Nomada panzeri</i>, <i>Procloeon bifidum</i>, Acid Frillwort (<i>Fossombronia wondraczekii</i>), Anomalous Flapwort (<i>Mylia anomala</i>), Bifid Crestwort (<i>Lophocolea bidentata</i>), Bog-moss Flapwort (<i>Odontoschisma sphagni</i>), Common Frillwort (<i>Fossombronia pusilla</i>), Dilated Scalewort (<i>Frullania dilatata</i>), Glaucous Crystalwort (<i>Riccia glauca</i>), Mueller's Pouchwort (<i>Calypogeia muelleriana</i>), Trunk Pawwort (<i>Barbilophozia attenuata</i>), Tumid Notchwort (<i>Lophozia ventricosa</i>), Two-horned Pincerwort (<i>Cephalozia bicuspidata</i>), Whiskered Veilwort (<i>Metzgeria consanguinea</i>), Budapest Slug (<i>Tandonia budapestensis</i>), English Chrysalis Snail (<i>Leiostyla (Leiostyla) anglica</i>), Marsh Whorl Snail (<i>Vertigo (Vertigo) antivertigo</i>), Point Snail (<i>Acicula fusca</i>), Prickly Snail (<i>Acanthinula aculeata</i>), Smooth Grass Snail (<i>Vallonia pulchella</i>), Striated Whorl Snail (<i>Vertigo (Vertigo) substriata</i>), Tree Snail (<i>Balea (Balea) perversa</i>), Aloe Haircap (<i>Pogonatum aloides</i>), Big Shaggy-moss (<i>Rhytidiadelphus triquetrus</i>), Bird's-claw Beard-moss (<i>Barbula unguiculata</i>), Bog Groove-moss (<i>Aulacomnium palustre</i>), Broom Fork-moss (<i>Dicranum scoparium</i>), American Mink (<i>Mustela vison</i>) (Invasive), Daubenton's Bat (<i>Myotis daubentonii</i>), Eastern Grey Squirrel (<i>Sciurus carolinensis</i>) (invasive), Eurasian Badger (<i>Meles meles</i>), Eurasian Pygmy Shrew (<i>Sorex minutus</i>), European Otter (<i>Lutra lutra</i>), European Rabbit (<i>Oryctolagus cuniculus</i>), Irish Hare (<i>Lepus timidus subsp. hibernicus</i>), Lesser Noctule (<i>Nyctalus leisleri</i>), Pine Marten (<i>Martes martes</i>), Pipistrelle (<i>Pipistrellus pipistrellus sensu lato</i>), Soprano Pipistrelle (<i>Pipistrellus pygmaeus</i>), West European Hedgehog (<i>Erinaceus europaeus</i>) were noted within the 10km square.</p>
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No species of conservation importance have been noted within the site outline.

Table 4.4 Species found by NPWS within 10km.

<p>Annual Knawel (<i>Scleranthus annuus</i>), Basil Thyme (<i>Clinopodium acinos</i>) Betony, (<i>Stachys officinalis</i>) Green-winged Orchid (<i>Orchis morio</i>), Heath Cudweed (<i>Gnaphalium sylvaticum</i>), Henbane (<i>Hyoscyamus niger</i>), Meadow Barley (<i>Hordeum secalinum</i>), Meadow Saxifrage (<i>Saxifraga granulata</i>) Round-fruited Rush (<i>Juncus compressus</i>), Swamp Meadow-grass (<i>Poa palustris</i>), Wintergreen (<i>Pyrola rotundifolia subsp. Rotundifolia</i>), Badger (<i>Meles meles</i>), Black Rat (<i>Rattus rattus</i>), Eurasian Pygmy Shrew (<i>Sorex minutus</i>), Eurasian Red Squirrel (<i>Sciurus vulgaris</i>), European Otter (<i>Lutra lutra</i>), , Irish Hare (<i>Lepus timidus subsp. Hibernicus</i>), Irish Stoat (<i>Mustela erminea subsp. Hibernica</i>), Otter (<i>Lutra lutra</i>), Pine Marten (<i>Martes martes</i>), Red Deer (<i>Cervus elaphus</i>), West European Hedgehog (<i>Erinaceus europaeus</i>) & Whiskered Bat (<i>Myotis mystacinus</i>) Common Frog (<i>Rana temporaria</i>) & Smooth Newt (<i>Lissotriton vulgaris</i>).</p>

The closest species recorded by NPWS to the site was otter (*Lutra lutra*) at 1.1km north west of the site (on the River Dee) and two separate common frog (*Rana temporaria*) sightings 2.3 and 2.5 km to the south of the site. No species of conservation importance have been noted on site by NPWS.

4.5 SITE SURVEY

Site assessments were carried out on the 23rd July 2020. Habitats within the proposed development site were classified according to Fossitt (2000) (Figure 4.6) and the species noted within each habitat are described. A bat survey, that included an internal and external examination of the buildings on site in addition to a bat emergent/detector survey was also carried out on the 23rd July 2020. Results of bird surveys are seen in Appendix 4.1 (Volume III of the EIAR).

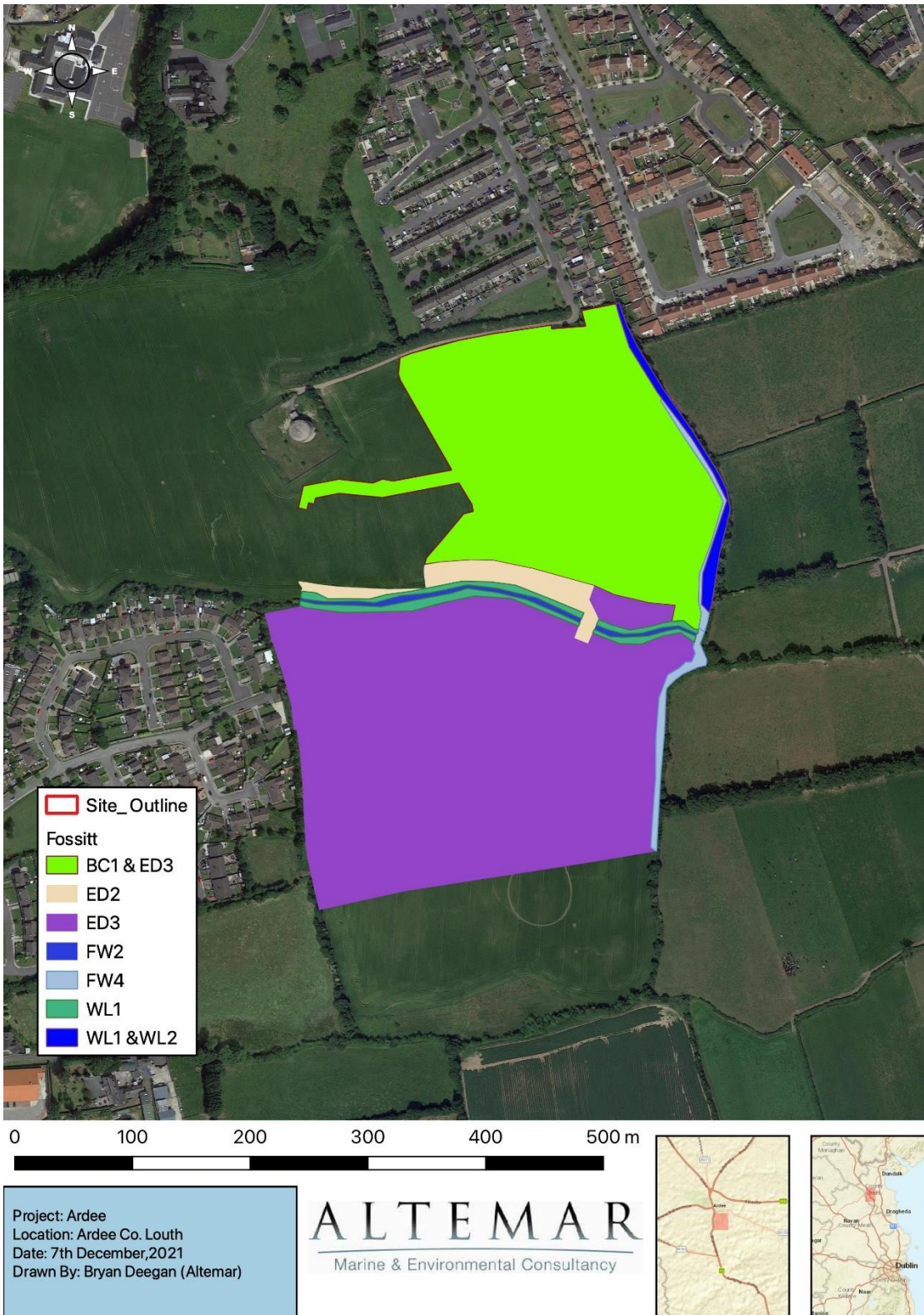


Figure 4.6. Fossitt Habitats on site (See habitat descriptions for Fossitt codes) (2021)

BC1-Cultivated Land – ED3- Recolonising Bare Ground.

An existing housing development is currently being developed to the west of the proposed development site. This has resulted in disturbance of a portion of the site (Figure 4.6 (BC1&ED3)). However, a field at the northern end of the site was sown for arable but appears to have been unmanaged for several years. As a result, opportunistic flora species have begun to colonise. Species noted included rape (*Brassica napus*), wild teasel (*Dipsacus fullonum*), oxeye daisy (*Leucanthemum vulgare*), great willowherb (*Epilobium hirsutum*), rosebay willowherb (*Chamaenerion angustifolium*), thistles (*Cirsium arvense*, *C. vulgare*), common ragwort (*Senecio jacobaea*), perennial sowthistle (*Sonchus arvensis*), creeping buttercup (*Ranunculus repens*), dandelion (*Taraxacum spp.*), docks (*Rumex spp.*), plantains (*Plantago spp.*), nettle (*Urtica dioica*), common poppy (*Papaver rhoeas*), cat's-ear (*Hypochaeris radicata*), groundsel (*Senecio vulgaris*), cow parsley (*Anthriscus sylvestris*), colt's Foot (*Tussilago farfara*), wild carrot (*Daucus carota*), sun spurge (*Euphorbia helioscopia*), common fumitory (*Fumaria officinalis*), pineapple weed (*Matricaria discoidea*) with bramble (*Rubus fruticosus*), hedge bindweed (*Calystegia sepium*) at the edges. No species of conservation importance were noted.



Plate 1. BC1-Cultivated Land – ED3- Recolonising Bare Ground (2020)

FW2- Depositing/lowland rivers

The Rathgory Tributary is located within the site outline and it is proposed to realign the stretch of stream within the site outline. Both sides of the proposed development slope towards the stream which is heavily tunnelled by a hedgerow located on both sides of the watercourse. The stream is heavily silted and no instream fauna or flora were noted. The proposal includes the development of a fisheries compliant biodiversity corridor with pools, riffles and glides with a reduction in the cover of trees to allow in stream vegetation to grow. No species of conservation importance were noted in the watercourse.

ED2 Spoil and Bare ground.

An area of the site had been recently been cleared by machinery. Also an area of stone was noted on site. No flora were noted in these areas.

ED3 Recolonising Bare ground.

Areas of the site had begun to recolonise following site recent clearance in the past. Species noted included rape (*Brassica napus*), oxeye daisy (*Leucanthemum vulgare*), great willowherb (*Epilobium hirsutum*), rosebay willowherb (*Chamaenerion angustifolium*), thistles (*Cirsium arvense*, *C. vulgare*), common ragwort (*Senecio jacobaea*), docks (*Rumex spp.*), plantains (*Plantago spp.*), nettle (*Urtica dioica*), cat's-ear (*Hypochaeris radicata*), colt's Foot (*Tussilago farfara*), common fumitory (*Fumaria officinalis*) and bramble (*Rubus fruticosus*). No species of conservation importance were noted.



Plate 2. Heavily tunnelled watercourse with hedgerows on both sides (2021).

WL1- Hedgerows

A dense pair of hedgerows are located on both sides of the stream on site (Plate 2). Species including elder (*Sambucus nigra*), blackthorn (*Prunus spinosa*), hawthorn (*Crataegus monogyna*), holly (*Ilex aquifolium*), dog-rose (*Rosa canina*), bramble (*Rubus fruticosus* agg.), ash (*Fraxinus excelsior*), ivy (*Hedera helix*), ash (*Fraxinus excelsior*), wild cherry (*Cerasus avium*), honeysuckle (*Lonicera periclymenum*) and cleavers (*Galium aparine*) were noted.

WL2- Treelines

Treelines are located in the eastern and western boundaries of the site. Species were similar to the hedgerows above. However, several mature and large ash (*Fraxinus excelsior*) and white willow (*Salix alba*) were notable within the treelines. Towards the watercourse several of the large trees were clad in dense ivy growth. These trees would form areas of bat roosting potential, but no bats were observed emerging from the trees on site.

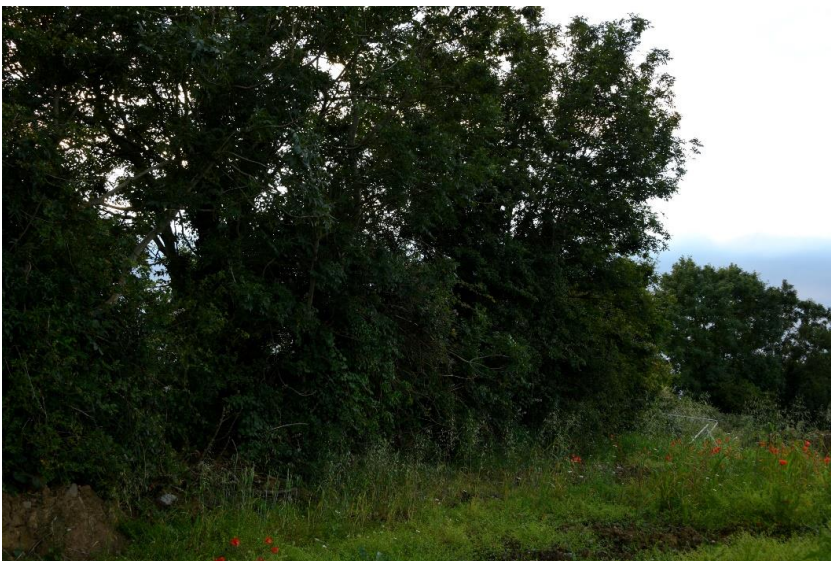


Plate 3. Treelines.

Bats

There were no seasonal or climatic constraints as survey was undertaken within the active bat season in good weather conditions with daytime temperatures of 16°C after dark. Winds were very light and there was no rainfall. No evidence of a bat roosts was found in any of the onsite trees. A detector survey was carried out with a Batbox Duet is a dual-mode bat detector. Foraging activity of two bat species soprano pipistrelle (*Pipistrellus pygmaeus*) was noted along the southern side of the hedgerow that bisects the site. A Leisler's bat. (*Nyctalus leisleri*) was noted at the eastern end of the watercourse foraging in the vicinity of the white willow (*Salix alba*). No foraging was noted in other areas of the site.

Evaluation of Habitats

The proposed development site is primarily a series of neglected arable fields that have seen recent disturbance. The watercourse (acting as a biodiversity corridor), hedgerows and treelines would be seen as the most important habitats on site, not because of the species noted but by the linear nature of the elements providing biodiversity corridors to the surrounding areas. No other habitats of conservation significance were noted within the site outline.

Plant Species

The plant species encountered at the various locations on site are detailed above. No rare or plant species of conservation value were noted during the field assessment. Records of rare and threatened species from NBDC and NPWS were examined. No rare or threatened plant species were recorded in the vicinity of the proposed site. No invasive plant species that could hinder removal of soil from the site during groundworks, such as Japanese knotweed, giant rhubarb, Himalayan balsam or giant hogweed were noted on site.

Fauna

No fauna of conservation importance were noted on site. Evidence of rabbit activity was noted on site. However, it should be noted that there is potential for downstream impacts which could impact on species of conservation importance including otter (*Lutra lutra*) and Atlantic salmon (*Salmo salar*).

Amphibians/Reptiles

The common frog (*Rana temporaria*) was not observed on site. However there are features within the site boundary that could be important to frogs including the watercourse and drainage ditches. It is likely that frogs may be present on site but were not noted during the survey. The common lizard (*Zootoca vivipara*) or smooth newt (*Lissotriton vulgaris*) were not recorded on site.

Terrestrial Mammals

Badgers have been noted within the 10km² grid by the NPWS. No badgers or badger activity was noted on site. Otters (*Lutra lutra*) activity or holts were not noted on site but otters may be present as they are noted downstream on the River Dee. However, there is a paucity on instream biodiversity on the stream. No evidence of deer was noted on site. Hedgehogs (*Erinaceus erinaceus*) have been recorded by NPWS within the 10km square. No hedgehogs were seen during the site visit, but may be present on site. No protected terrestrial mammals were noted on site or in the immediate vicinity of the site.

Birds

As outlined in Appendix 4.1. in relation to the bird surveys "*Many of the species noted are very common in Ireland. However, there were red-listed and amber-listed species that would merit greater consideration for their protection due to modifications to this site (see * below for clarification of these categories). One red listed species was noted nesting within the site. There were two displaying Meadow pipits in the field north of the east-west hedge. One red list species may have been nesting within adjoining hedgerow (or potentially within the eastern boundary of the site. There was a single singing yellowhammer in the hedge running east from the north-eastern edge of the site. Herring gulls (amber listed) were feeding both in winter and early summer but do not nest within the site. No amber listed species were breeding within the site based on the surveys on May 4th and 26th 2021.*

Nesting was noted within and adjacent to the site in the trees and scrub by typical garden species. Birds were present in an abundance and distribution that would be expected for a rural / semi-urban site that has been modified by construction. The southern field has undergone much soil movement due to the construction of housing in adjoining lands. Work in adjoining areas has led to some soil disturbance but little hedgerow or tree removal except within the areas previously approved for development and undergoing construction work.

Meadow pipits were typically in very low numbers or absent with one peak in numbers on 28th November 2020 of 23 birds. This species was present south of the west-east hedge on areas of short grass / cereal in winter and absent in the spring / early summer period (nesting period). Males were present within the field north of the west-east hedge in May 2021.

Yellowhammers were present during all winter and spring visits and their numbers were highest between the late December and January visits when both their number and the number of lesser redpolls were high. Yellowhammers were greatly reduced in May 2021, with one male noted on the eastern edge of the site." ...*"Within the site, the lands directly north of the west-east hedge were the favoured feeding area. The field south of the hedge has been greatly altered by soil movement and there was less established crop here. Another species, the tree sparrow that was present in very low numbers (3 individuals were present on 21st January 2021). This Amber listed species (for breeding birds only) is rather local in Ireland, especially in the west and south. Similar to the yellowhammer, it is largely associated with cereal production. Tree sparrows are primarily sedentary but young birds may disperse to new areas. Snipe were occasionally encountered feeding within the site, with a maximum of 2 in late January 2021. These are not likely to be nesting within the site given the level of disturbance."*

4.6 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development site extends to c. 13.03 ha at Bridgegate, Rathgory & Mulladrillen, Drogheda Road, Ardee, County Louth and adjoins Phases 1-3 at Bridgegate (under construction) on lands to the west, accessed from the N2 Drogheda Road. The proposals overlap the boundary of permitted development Reg. Ref.: 10174; ABP Ref: PL15.238053 (as amended) at the western boundary and will supersede granted development in this area which consists of 31 no. dwellings, crèche and community building and public open space.

The development will consist of:

- A. The construction of 272 no. residential units comprising a mix of 206 no. 2, 3 and 4 bedroom houses (all 2 storeys) including 50 no. 2-bedroom houses (Type 1), 145 no. 3-bedroom houses (Types 2, 3, 6) and 11 no. 4-bedroom houses (Types 4, 5) all with private open space and car parking, alongside 66 no. duplex units (all 3 storeys) including 17 no. 1-bedroom units (Types D5, D8), 24 no. 2-bedroom units (Types D1, D3, D6) and 25 no. 3-bedroom units (Types D2, D4, D7), all with private open space in the form of terrace at upper floor level and external garden space, with 499 sqm of communal open space serving Duplex Blocks A-B (48 no. units) (served by 2 no. bin and bike stores [each c. 51 sqm] adjacent) at Bridgegate Avenue, providing a total residential gross floor area of c. 28,168.9 sqm;
- B. A part 1, part 2 no. storey crèche (c. 484.1 sqm) and playground and a single storey community building (c. 165 sqm) located adjacent at a central community hub (with bin and bike store [c. 23 sqm]) accessed from Bridgegate Avenue served by car parking located on Bridgegate Green and Bridgegate Avenue;
- C. A landscaped Public Park located in the northern part of the site extending to c. 3.6 ha accessed from the community hub and between duplex Blocks B & C at Bridgegate Avenue, with 2 no. pedestrian links to permitted public park adjoining to the west and 1 no. pedestrian footpath extending to the northern perimeter at Hale Street, with a reservation for a future link road to lands to the east facilitated in the northern section of the park;
- D. Works to the Rathgory Tributary located to the south of Bridgegate Avenue comprising the realignment of the channel and regrading and reprofiling of land (as required), implementation of 2 no. vehicular crossings (including culverts and mammal passes) and the provision of a riparian corridor based around the open watercourse comprising landscaping and planting with safe access to the watercourse provided for maintenance purposes and 1 no. pedestrian and cyclist crossing;
- E. A series of landscaped public open spaces provided throughout the site with Public Open Space 01 (c. 1.05 ha) and Public Open Space 2 (c. 0.43 ha) located within the linear park (including riparian corridor) adjacent to the Rathgory Tributary with Public Open Space 03 (c. 0.29 ha) centrally located in the southern part of the site; open spaces will provide a mix of hard and soft landscaping, pedestrian and cycle access (cycle lanes provided at POS 1 and POS 2) and a range of activities including fitness spaces, kickabout area, amphitheatre and nature based play areas;
- F. Provision of shared surfaces, landscaped streetscapes including planting and landscaping at two neighbourhood streets in the southern part of the site, with roads provided to site boundaries to the east, south and west to facilitate possible future connections;
- G. All landscaping including planting to consolidate treelines and hedgerows forming existing site boundaries with agricultural lands to the east and Cherrybrook residential development to the west and all boundary treatments;
- H. Roads and access infrastructure taken from Bridgegate Avenue (permitted under Reg. Ref.: 10/174; ABP Ref: PL15.238053 [as amended]), the provision of a bus stop on the south side of Bridgegate Avenue adjacent to community hub and provision of cycle lanes at this location (continued through Public Open Space 01); a total of 480 no. car parking spaces (362 no. serving houses, 84 no. serving duplexes, 23 no. serving crèche and community building and 11 no. visitor and public open spaces), a total of 296 no. bicycle parking spaces (204 no. spaces serving duplexes [60 visitor spaces], 32 no. spaces at the community hub and 60 no. visitor spaces);
- I. Provision of 2 no. ESB substations, all associated drainage and services infrastructure (surface water, foul and water supply), public lighting, SUDS drainage and works to facilitate the development.

- J. The proposals overlap the boundary of permitted development Reg. Ref.: 10174; ABP Ref: PL15.238053 (as amended) at the western boundary and will supersede granted development in this area which consists of 31 no. dwellings, crèche and community building and public open space.

4.7 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

This section provides a description of the potential impacts that the proposed development may have on biodiversity in the absence of mitigation. The proposed development will involve the removal of the existing terrestrial habitats on site, re-profiling, excavations and the construction of roads, dwellings and associated services. The project also proposes to re-align the Rathgory Tributary, install culverts and landscape the riparian corridor.

4.7.1 Construction Impacts

This report has been prepared to outline the construction and operational phase measures in addition to detailing the potential impacts on sensitive receptors within the Zone of Influence (ZOI) and to designated conservation sites including the Natura 2000 sites downstream of the proposed development. The construction of the proposed development, would potentially impact on the existing ecology of the site and the surrounding area. These potential construction impacts would include impacts that may arise during the site clearance, re-profiling of the site and the building phases of the proposed development.

Construction phase mitigation measures are required on site particularly as significant reprofiling of the site is proposed which will remove all existing terrestrial habitats and can lead to silt laden and contaminated runoff. In addition, the Rathgory Tributary is located in the centre of the site running from east to west. It is also proposed install new culverts and realign the course of the existing stream. There is potential for silt laden runoff and contamination to enter the watercourse with potential for downstream impacts.

Designated Natura 2000 sites within 15km

The proposed development is not within a designated conservation site. It should be noted that the proposed development site is on the Rathgory Tributary and the nearest Natura 2000 sites with a hydrological pathway are the Dundalk Bay SPA and the Dundalk Bay SAC both located downstream of the proposed development site. The River Dee is a salmonid river Atlantic salmon (*Salmo salar*). The Rathgory Tributary has no instream faunal biodiversity and is heavily tunnelled by trees and has a paucity of instream vegetation. There are no features of interest of these conservation sites that would migrate through or be seen on this proposed development site. No other Natura 2000 sites have a direct or indirect hydrological connection or pathway from the proposed development site.

Runoff during site demolition, re-profiling, the construction and operation of project elements could impact on the Rathgory Tributary and the downstream River Dee, with water quality or downstream impacts on Dundalk Bay, 12.1 km from the proposed development site. Impacts on the Rathgory Tributary would be seen as the primary vector for impacts on conservation sites. Ensuring water quality and compliance with Inland Fisheries Ireland procedures/ conditions and the Water Pollution Acts would be seen as the primary method of ensuring no significant impact on designated conservation sites. The proposed development is not an ex-situ site for proximate SPA's.

Altamar has consulted with Inland Fisheries Ireland (IFI) and the proposed works will be carried out based on best practice mitigation procedures and compliance with IFI requirements or conditions, including the prevention of silt and or pollutants entering watercourses. In addition, the project will have to comply with SUDS, County Council requirements and the provision of additional measures such as petrochemical interceptors and silt interception. There will be no direct pumped discharge to or abstraction from the stream during works. However, a series of silt interception measures will be in place to desilt surface runoff from the lands during works. Standard construction phase and operational controls in relation to onsite drainage and instream works will be in place and no impact is foreseen in relation to designated conservation sites.

Terrestrial Ecology

During the site visits no flora, bird or terrestrial mammal species of conservation importance were recorded on site or in NPWS or NBDC records. Due to the stream diversion on site the proposed development will result in the loss of the hedgerow proximate to the watercourse.

Common mammalian species. Loss of habitat and habitat fragmentation may affect some common mammalian species and there is expected to be mortality during construction.

Amphibians and reptiles. Frogs and reptiles were not observed on site. However, the Rathgory Tributary flows through the site and frogs may occur on site. The common lizard may occur on site but, was not observed. The

proposed development will remove some potential foraging habitats on site. Some mortality may occur during construction.

Bat Fauna. There is no evidence of a current or past bat roost in the trees on site, therefore no significant negative impacts on the roosting of these animals are expected to result from the proposed development. Foraging activity was noted along the riparian corridor and adjacent treelines. Mitigation measures should be in place during works and supplementary planting of the riparian hedgerow should be carried out. However, this planting should be such that it does not encourage tunnelling of the watercourse by trees. An Arboricultural Impact Assessment was carried out by Charles McCorkell. It states that “The removal of eight trees and seven hedgerows is required to facilitate the proposed development. These losses will have an insignificant impact on the character and appearance of the local area due to their low quality or limited public amenity value within the surrounding landscape.”

Avian Ecology

As outlined in Appendix 4.1 “There will be a reduction in the vegetation cover and removal of the scrub and some of the mature trees that offer nest sites for the bird species noted within the site. Trees that are retained will be under considerable pressure from disturbance for the duration of construction and from human presence into the future. This will arise from the level of noise and lighting associated with construction and following this from lighting associated with residents. This will be a long-term moderate negative impact as there will be a loss in established vegetation.”

“Lighting can affect resting, feeding and commuting behaviour for some species and for many individuals of species that are considered more light-tolerant.”

“Reduced vegetation will lead to reduced insect abundance. There will be clearance of much of the current crop and adjoining perimeter vegetation in the clearance of the site for construction. This will be a permanent slight negative impact on birds.”

4.7.2 Operational Impacts

Once constructed all onsite drainage will be connected to separate foul and surface water systems. Surface water runoff will comply with SUDS. The biodiversity value of the site would be expected to improve as the landscaping matures. It would be expected that the ecological impacts in the long term would be positive once landscaping has established due to the implementation of a fisheries compliant realignment and a reduction in tunnelling which would encourage instream biodiversity.

Designated Conservation sites within 15km

The development will comply with LCC drainage requirements and the Water Pollution Acts. Measures will be in place to prevent downstream impacts. No significant impacts on designated sites are likely during operation.

Terrestrial Ecology

As the landscaping elements improve with maturity it would be expected that the biodiversity value of the site to birds and flora would also increase. Mitigation measures should be in place to offset the short term nesting resource.

4.8 POTENTIAL CUMULATIVE IMPACTS

The proposed development site is located in a suburban environment. Construction on this site will create localised light, dust and noise disturbance with potential for downstream impacts. Projects considered for cumulative effects are as follows:

Planning Ref.	Address	Proposal
21535	Rathgory/Mulladrillen, Drogheda Road, Ardee, County Louth	EXTENSION OF DURATION for Residential Development permitted under Reference 10/174 (ABP PL15.238053) consisting of Permission for a 10 year permission for a development consisting of (i) a public park (4.91ha) including play areas & a MUGA (Multi Use Games Area), (ii) a total of 281 residential dwellings (14 no. apartments, 34 no. duplex type dwellings, 83 no. terrace dwellings, 72 no. semi-detached dwellings, 78 no. detached dwellings) ranging in height from 1-4 storeys (including split-level / semi-basement units) with solar panels & with balconies to serve apartment / duplex units (iii) A single storey community building (167m ²), (iv) a three storey neighbourhood centre incorporating 2 no. retail units & 1 no.

		<p>unit for sale of hot food for consumption off the premises at ground floor level (ground floor has gross floor area of 290m²), with associated signage & with duplex dwellings at first & second floor level; (v) construction of a section of new Local Collector Road (c.600m in length), (vi) 503 no. car parking spaces & 54 no. cycle parking spaces, (vii) Bring bank re-cycling facility, (viii) landscaping works to include the provision of local & neighbourhood open space areas, planting & augmentation of existing boundary hedgerows, (ix) new road junction access off Drogheda road (N2) including provision of nearside passing option, pedestrian refuge islands & road signage, (x) 5 no. ESB sub stations (xi) All associated site development works including construction of roads, cycle routes & pedestrian walkways, partial re-alignment & culverting of existing watercourse which bisects the application site, re-routing of existing water pipelines to/from the town reservoir located at the summit of Mulladrillen Hill & which traverse the application site, & provision of new water supply system, foul water drainage systems including connection in to the existing system on the N2 & on the access road in De La Salle Crescent Housing Estate, surface water drainage system including discharge (after attenuation) to the existing watercourses through & around the perimeter of the site, boundary treatments, public lighting, alterations to site levels & construction of retaining walls on a site extending to 19 hectares. A Master Plan pertaining to an area extending to 27.8 hectares & incorporating the application site accompanies the application. An Environmental Impact Statement (EIS) will be submitted to the Planning Authority with this application.</p>
19319	Rathgory Tributary, Clonmore, Ardee	<p>Permission to vary development permitted under P.A. Ref. 17330 & ABP Ref. PL15.300936, comprising 48 no. dwellings to provide a revised total of 55 no. dwellings comprising 8 no. 1 bedroom apartments, 11 no. 2 bedroom 2 storey houses, 32 no. 3 bedroom 2 storey houses and 4 no. 2 storey 4 bedroom houses in terraced and semi-detached format, an ESB substation and all associated landscaping, open space (which includes a playground for children), boundary treatments and all associated site development works. The variations include alterations to the permitted layout including repositioning and re-configuration of dwellings, including the 2 storey apartment building and the repositioning of public open space. The application site boundaries remain unaltered from that permitted.</p>
19336	Bridgegate in the townland of Rathgory and Mulladrillen, Drogheda Road, Ardee.	<p>The proposed development amends and will supersede elements of the development permitted under Reg. Ref.: 10/174 (An Bord Pleanála Ref. PL15.238053), which is presently under construction.</p> <p>The proposed development will consist of the construction of a total of 65 no. residential houses (replacing the previously permitted dwellings at the location), comprising of the following:</p> <ul style="list-style-type: none"> • 18 no. 2-bed terrace two storey dwellings (Type 1); • 23 no. 3-bed detached and semi-detached two storey dwellings (Type 2); • 12 no. 3-bed detached and semi-detached two storey dwellings (Type 3); • 4 no. 4-bed semi-detached two storey dwellings (Type 4); • 2 no. 4-bed detached two storey dwellings (Type 5); • 6 no. 3-bed semi-detached two storey dwellings (Type 6). <p>The proposed development also provides for a community facility extending to 176 sqm gross floor area and a crèche building with a gross floor area of 378 sqm gross floor area, which will replace previously granted crèche and commercial units at the location. Vehicular access for the residential units will be provided via the adjoining permitted residential development (Louth County Council Reg. Ref.: 10/174, currently under construction). The total gross</p>

		<p>floor area of the proposed development equals c. 7,348 sqm. The proposal includes all associated site works, internal roads, cycleways and footpaths, the provision of public open space, car parking, landscaping, boundary treatments, and foul and surface water drainage.</p>
19353	<p>Bridgegate in the townland of Rathgory and Mulladrillen, Drogheda Road, Ardee.</p>	<p>The proposed development amends and will supersede elements of the development permitted under Reg. Ref.: 10/174 (An Bord Pleanála Ref. PL15.238053), which is presently under construction.</p> <p>The proposed development will consist of the construction of a total of 52 no. residential houses (replacing previously permitted dwellings at the location) comprising of the following:</p> <ul style="list-style-type: none"> • 11 no. 2-bed terrace two storey dwellings (Type 1); • 26 no. 3-bed semi-detached two storey dwellings (Type 2); • 7 no. 3-bed detached and semi-detached two storey dwellings (Type 3); • 8 no. 4-bed semi-detached two storey dwellings (Type 4). <p>Vehicular access for the residential units will be provided via the adjoining permitted residential development (Louth County Council Reg. Ref.: 10/174, currently under construction). The total gross floor area of the proposed development equals c. 5,553 sqm. The proposal includes all associated site works, internal roads, cycleways and footpaths, the provision of public park area, car parking spaces, landscaping, boundary treatments, and foul and surface water drainage.</p>

Permission was granted with a range of conditions for planning application reference number **19319**, which is located nearby the proposed development that is the subject of this report. The Planner's Report that assesses application reference number **19319** states the following in relation to Natura 2000 sites: *"Appropriate Assessment: The site is located a substantial distance from the nearest European site at Stabannan-Braganstown SPA to the NE and there would be no direct connection between the works and this or any other designated site."*

Separate Irish Water upgrade works are needed to facilitate development in general in Ardee, including the subject lands, but do not form part of this application. As part of the conformation of feasibility CDS20003735 that forms part of this application Irish Water note the following;

'The existing wastewater network will require upgrades to cater for the additional proposed load. The upgrade will involve upsizing of between 300 and 1000 meters of existing 225mm sewer along the public road. It is not expected that 3rd party permissions will be required outside the requirements for a road opening licence. The exact details of this upgrade can be agreed at connection application stage.'

The replacement / upsizing of the sewerage supply by Irish Water to facilitate the proposed development would require works to the public road will involve the excavation of the existing pipeline and surround along the length of its route and will be replaced with upgraded pipelines with granular fill surrounding it. The top of the trench will comprise standard backfilled material and road coverings.

During excavation works for the pipeline there is potential for entry of sediment laden run-off to the Rathgory Tributary if appropriate mitigation measures are not put in place.

The construction of the pipelines will be to Irish Water specifications and the construction management (including the implementation of appropriate mitigation measures) and compliance with Water Pollution Acts will ensure that there are no significant impacts arising.

The proposed development cumulatively with other plans or projects is unlikely to have a significant effect on biodiversity or designated sites.

4.9 'Do NOTHING' IMPACT

In the absence of the proposed development, it would be expected that biodiversity would increase over time on site as a lack of maintenance of the site would lead to scrub encroachment and increase in nesting and foraging habitat.

4.10 AVOIDANCE, REMEDIAL & MITIGATION MEASURES

Mitigation measures will be incorporated into the proposed development to minimise the potential negative impacts on the ecology within the ZOI. These measures are outlined below in sequence and incorporate elements outlined elsewhere in this EIAR which will be incorporated into the CEMP.

Standard construction and operational controls will be incorporated into the proposed development project to minimise the potential negative impacts on the ecology within the Zone of Influence (Zoi) including the Rathgory Tributary and River Dee.

Designated Conservation sites within 15km

As the main potential vector for impacts would be seen to be via the River Dee, no additional controls are required besides those outlined below, during the construction and operational phases of the development, to mitigate against potential negative impacts on designated conservation sites. The mitigation has been designed to ensure that the project will comply with the Water Pollution Acts and standard LCC and IFI Conditions in relation to construction and drainage. All construction and operational phase mitigation measures outlined in this EIAR will be incorporated into the CEMP will be implemented. The CEMP will reflect the outcome EIA process as part of approval by the Competent Authority and will incorporate any additional measures deemed appropriate prior to the commencement of the relevant phase on site.

Development Construction

Contamination of watercourses. As existing drainage ditches are present on site, in proximity to the Rathgory Tributary and substantial instream works are proposed, a project ecologist will be appointed prior to works or site clearance commencing on site. All works in the riparian corridor will be carried out in consultation with and to the satisfaction of IFI and the project ecologist, following the best practice guidelines for construction in the vicinity of watercourses.

All works on site and in the riparian corridor will include mitigation measures to prevent silt from runoff during works as set out below.

4.10.1 RIPARIAN CORRIDOR CONSTRUCTION STAGE

As significant site clearance is involved in the project and the site is on sloping land adjacent to a watercourse measure will be put in place to ensure that runoff from the site during construction is contained and that silt is intercepted. A silt interception system will be prepared in consultation with the project ecologist. The purpose of this is to ensure that silt is removed from runoff prior to entering the stream throughout the construction process. The following measures will be carried out to ensure that the site runoff is suitably contained during construction:

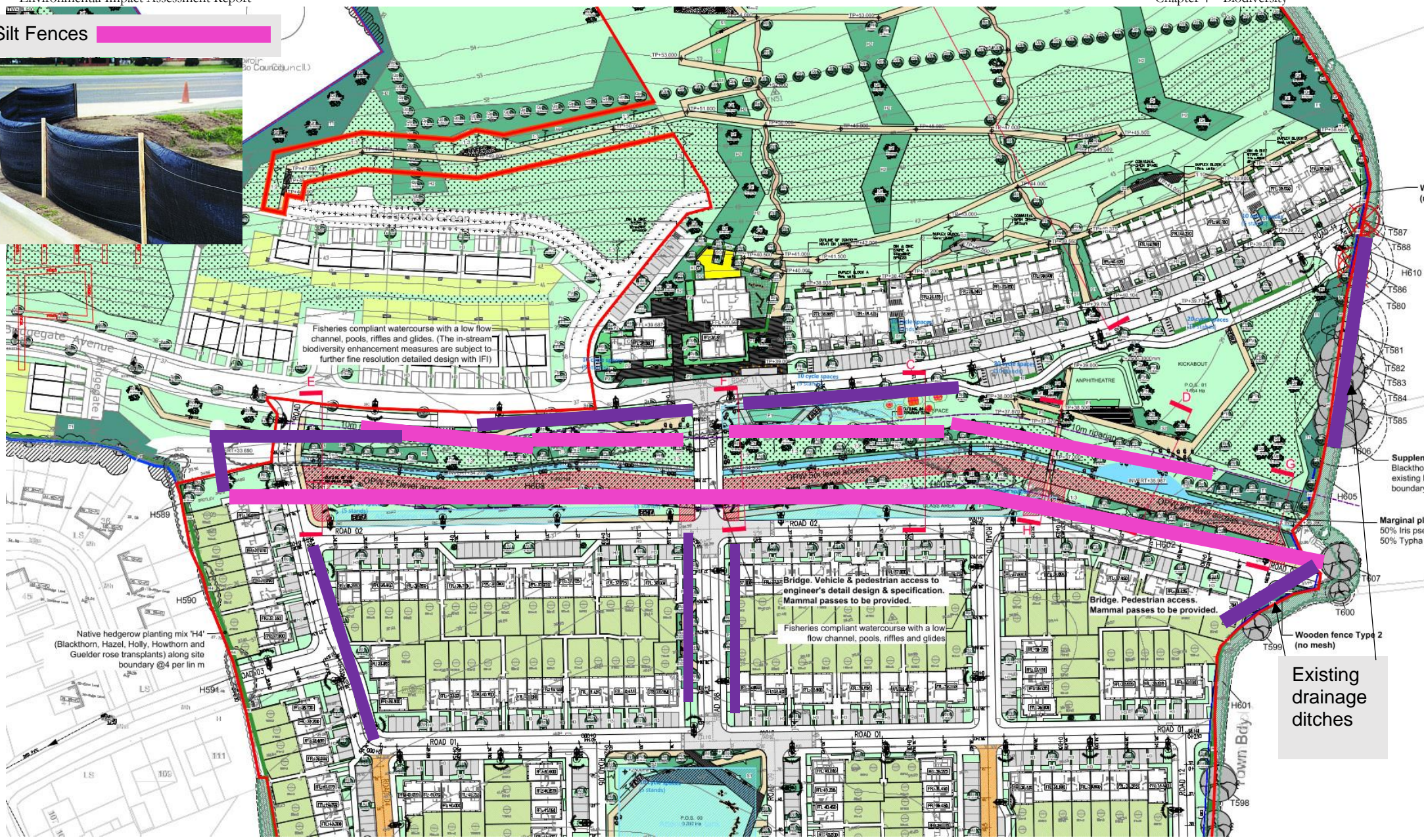
- a) Site works will commence with the submission of a construction methodology to IFI. It should be noted that the watercourse will be fisheries compliant and will contain features for biodiversity enhancement. Following agreement of the methodology with IFI the excavation of the riparian diversion will be carried out in the dry, isolated from the existing watercourse. Only when all dry works have been completed and inspected by the ecologist and IFI will the stream become live.
- b) Once the realignment has been carried out the riparian buffer of 10m will be established, landscaped and marked out prior to site clearance works on the remainder of the site. It is important that this area is cleared and landscaped in late spring/early summer as a portion of this area is within the potential flood zone of the river and landscaping needs to be well established prior to any risk of flooding, in order to limit any silt entering the stream during a flood.
- c) The placing of silt fences in the riparian corridor will be carried out to prevent runoff entering the newly established riparian corridor. It is important that the bases of these are buried deeply in the soil as this area has the potential to be flooded and they could cause downstream impacts if not installed correctly. The riparian buffer of 10m will be established, landscaped and marked out to avoid machinery access, prior to site clearance works on the remainder of the site.
- d) A temporary trench will be dug at the edge of the riparian corridor so that any runoff during works will run parallel to the river and be caught by silt fences and measures in the trench. All planting and landscaping should be carried out immediately.
- e) Following the completion of this element of the project this area of the site will be closed off to machinery access.

4.10.2 DRAINAGE ON SITE OUTSIDE THE RIPARIAN CORRIDOR.

- a) Channels will be prepared on site, in the vicinity of future access roads. Within these channels silt fences/barriers will be placed and will consist of woven/terram style material of suitable density to remove the majority of silt from runoff. These will be maintained throughout the construction phase to ensure efficiency, prior to the installation of the permanent drainage network.
- b) Silt fences will be placed along the edge of the riparian corridor (outside of future construction areas) to capture runoff from the site. These will also prevent machinery from entering the riparian corridor.
- c) Mitigation measures including silt fences will be in place (in consultation with the project ecologist and IFI) to capture silt from runoff and prevent it from entering the stream during the culvert works.
- d) Appropriate storage and settlement facilities will be provided on site. This could include the provision of silt and petrochemical interception for water pumped on site (if required).
- e) Fuel, oils and Chemicals will be stored on an impervious base with a bund. Under LEED there will be a strategy put in place to prevent pollution of the watercourse. In most cases this will involve collecting the run-off and routing it to treatment by filtration, settlement or specialist techniques.

Additional mitigation if required will be placed on roadworks to capture silt that may not be caught by road sweeping, before runoff enters the Rathgory Tributary.

Silt Fences



Temporary Drainage channels with silt traps

Figure 4.7. Mitigation measures to protect the Rathgory Tributary and River Dee

4.10.3 Culvert Installation Methodology

It is proposed to install three river crossings (2 vehicle and 1 pedestrian). Due to the presence of sensitive species downstream of the works (Otter (*Lutra lutra*) and Atlantic salmon (*Salmo salar*)) in addition to having a direct hydrological pathway to two Natura 2000 sites downstream and the necessity to comply with Water Pollution Acts, it has been deemed necessary to limit the potential impact of the works, implement mitigation measures and carry out the instream works as follows:

Pre-Installation:

Prior to carrying out the works the project will:

- Submit a final methodology statement at least 1 month before the proposed in stream works to IFI.
- Notify IFI one week in advance of each culvert works commencing.
- Electrofish the water within the full extent of the works location to 50m downstream (if required by IFI), at the start of the project. Remove any fish and transport downstream (It would be preferable if this was carried out by IFI on the day of connection works if possible).

Installation process (live downstream culvert):

- A temporary stream diversion will be prepared with a 900mm diameter pipe.
- A minimum of four independent terram baffles will be placed downstream of the proposed works.
- The stream will be diverted through the pipe which will allow access to the bed of the original stream.
- The culvert will be installed in the dry while the river remains on its diverted course. The excavation will leave two areas of soil at either end of the diversion to prevent the river from entering the works area.
- Pumps will be placed within the diversion area should any seepage, rainwater or groundwater enter the works area. These are to be connected to silt busters/or to the onsite swales as directed by the project ecologist (and not directly back to the stream without filtering). Any seepage/rainwater/groundwater will be pumped onto open ground north of the river and allowed to seep naturally into the groundwater. No runoff will be allowed back into the stream.
- The excavated material will be stockpiled on site away from the watercourse (min 20m).
- Concrete units will be delivered to site on an Artic truck
- The new culvert sections will be lifted with the crane and placed on to the bed of Sand/stone as required.
- Minor adjustments if required will be made to ensure the first section is correct for line and level.
- The remaining sections will be installed using the same procedure.
- On completion of the installation backfilling will commence to the sides of the culvert.
- Backfill material will be placed and compacted in layers.
- New ducting sections will be placed downstream of the culvert.
- The ecologist will be in attendance for environmentally sensitive works.
- On completion of the backfilling the small remaining bunds trench will be removed.
- Silt interception methods will be implemented downstream prior to instream works.
- Instream biodiversity elements will be placed within the watercourse as instructed by the ecologist/IFI.
- A gradual switchover will be implemented and the stream will flow through the newly installed culvert under supervision of project ecologist.
- A gradual switch over to the diversion will be monitored by the project ecologist. This will involve the stream being gradually dammed both upstream and downstream of the crossing location using sandbags.
- Once the full flow is in the diversion and stable the Existing stream bed will then be gradually blocked off with sandbags and final elements of rock armour will be carried out behind sand bags.
- When complete downstream mitigation measures will be removed.

To construct the culverts at the mid and eastern end of the site these will be done in the dry and will not involve the diversion of the watercourse.

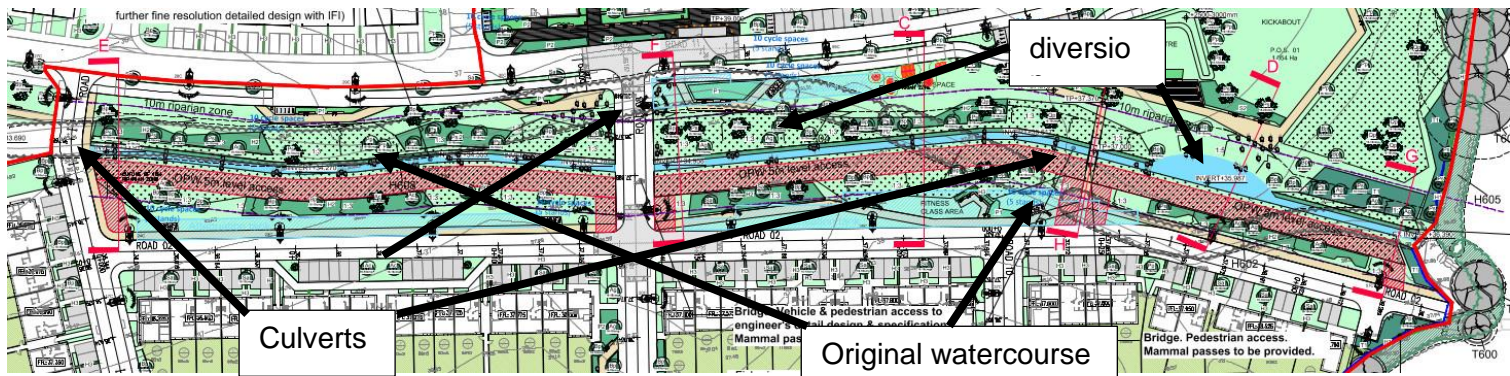


Figure 4.8. Proposed diversion and current layout

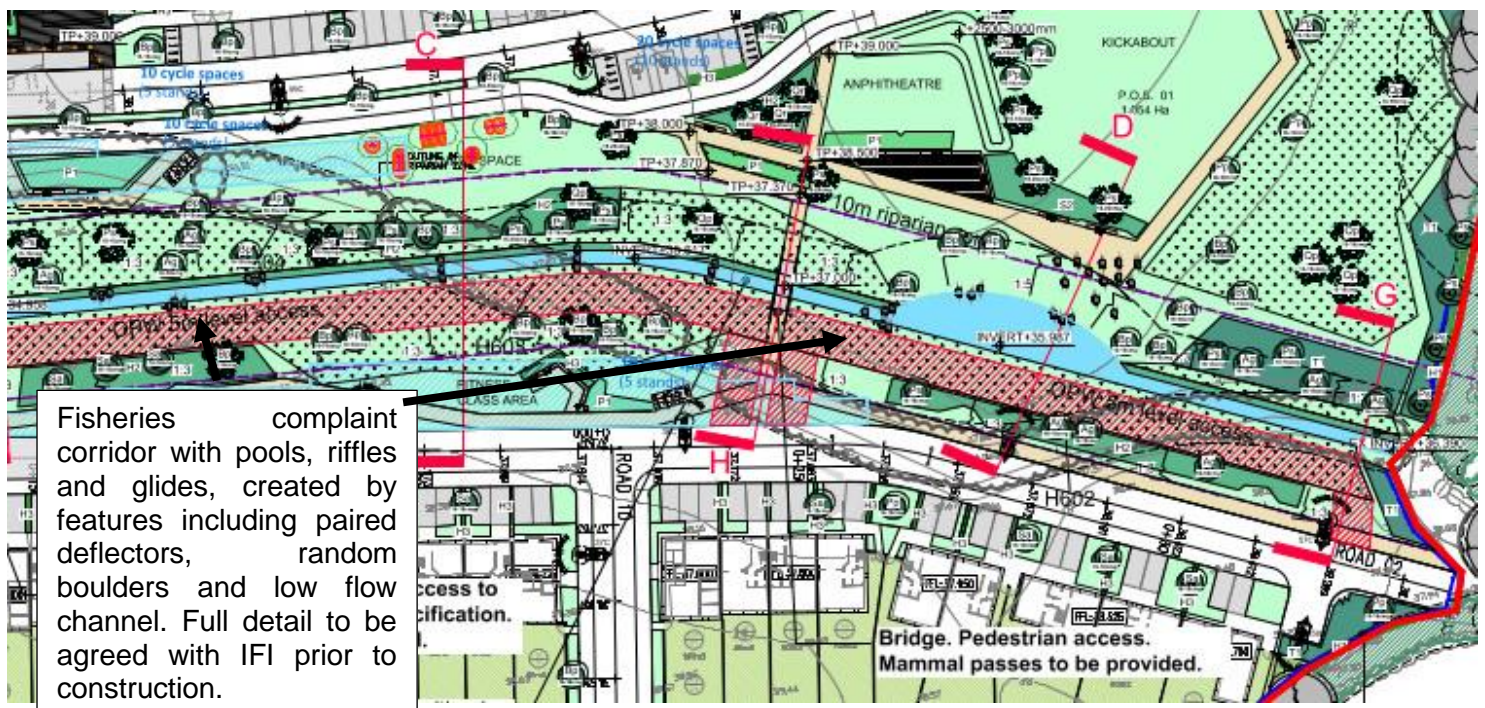


Figure 4.9. Fisheries complaint diversion

4.10.4 Relocate & Culverting of Stream

The future diversion of and installation of the culverts in, the Rathgory Tributary will be carried out in the dry, prior to carrying out any instream works, in order to mitigate the silt disruption caused from the installation of the proposed culvert. The installation of culverts will take approx. 5-7 days. During the works period, a project ecologist/senior environmental advisor will be in attendance to monitor sensitive works (instream/connection works). Culvert installation will be carried out in the dry and the entire project. The Rathgory Tributary will be connected to its new course following the installation under the supervision of the project ecologist. IFI may require inspection of the culvert prior to the Rathgory Tributary becoming live in the new diversion and culvert.

Table 4.5. Sensitive Receptors/Impacts and mitigation measures.

Sensitive Receptors	Potential Impacts	Designed-in Mitigation
<p>Dundalk Bay SAC Dundalk Bay SPA River Dee and Rathgory Tributary</p>	<ul style="list-style-type: none"> • Habitat degradation • Dust deposition • Pollution • Silt ingress from site runoff • Downstream impacts • Negative impacts on aquatic and bird fauna 	<ul style="list-style-type: none"> • All in-stream works methodologies will have prior approval of Inland Fisheries Ireland. • Best available technology (BAT) mitigation measures designed by project ecologist • Staging of project to reduce risks to watercourses from contamination with all instream works being carried out in Phase 1 of the project, where the stream is diverted, landscaped and protected from all subsequent phases. • Local watercourses (Rathgory Tributary) will be protected from dust, silt and surface water throughout the works. • Local silt traps established throughout site. • Mitigation measures on site include dust control, stockpiling away from watercourse and drains • Stockpiling of loose materials will be kept to a minimum of 20m from watercourses and drains. • Stockpiles and runoff areas following clearance will have suitable barriers to prevent runoff of fines into the drainage system and watercourses. • Fuel, oil and chemical storage will be sited within a bunded area. The bund will be at least 50m away from drains, ditches or the watercourse, excavations and other locations where it may cause pollution. • Bunds will be kept clean and spills within the bund area will be cleaned immediately to prevent groundwater contamination. Any water-filled excavations, including the attenuation tank during construction, that require pumping will not directly discharge to the stream. Prior to discharge of water from excavations adequate filtration will be provided to ensure no deterioration of water quality. • The excavation of the diversion should be carried out in the dry with no connections to the existing watercourse, until the works are complete with the exception of the small areas where the stream is currently live. • De-stocking of the Rathgory Tributary may need to be carried out prior to the commencement of works (if required by IFI) and upstream and downstream permeable barriers to remain in place until construction is completed. • In stream works to be carried out in full consultation with and to the advice of Inland Fisheries Ireland and the project ecologist. • Staging of project to initially stabilise, isolate, fence off watercourse on site • Mitigation measures on site include dust control, stockpiling away from watercourses and drains • Pollution control and mitigation on site • Stockpiling of loose materials will be kept away from watercourses and drains. A risk based approach will be taken. • Stockpiles and runoff areas following clearance will have suitable barriers to prevent runoff of fines into the drainage system and watercourses. • Fuel, oil and chemical storage will be sited within a bunded area. A risk based approach will be taken. • Bunds will be kept clean and spills within the bund area will be cleaned immediately to prevent groundwater contamination. • During the construction works silt traps will be put in place in the vicinity of all runoff channels the stream to prevent sediment entering the watercourse. • Petrochemical interception and bunds in refuelling area • Planting in the vicinity of the stream crossings should be put in place as soon as possible to allow biodiversity corridors to establish.

		<ul style="list-style-type: none"> • On-site inspections to be carried out by project ecologist. • Maintenance of any drainage structures (e.g. de-silting operations) will not result in the release of contaminated water to the surface water network. • No entry of solids to the associated stream or drainage network during the connection of pipework to the public water system • Landscaping of the Riparian corridor should be carried out to the satisfaction of IFI.
Watercourses	<ul style="list-style-type: none"> • Habitat Degradation • Dust deposition • Pollution • Silt ingress • Potential downstream impacts. 	<p>Measures outlined above in addition to:</p> <ul style="list-style-type: none"> • During the works silt traps will be put in place • No discharges will be to the watercourse during and post works • Silt traps established throughout site including a double silt fence between the site and the watercourse. • Sufficient onsite cleaning of vehicles prior to leaving the site and on nearby roads, will be carried out, particularly during groundworks. • The Site Manager will be responsible for the pollution prevention programme and will ensure that at least daily checks are carried out to ensure compliance. A record of these checks will be maintained. • The site compound will include a dedicated bund for the storage of dangerous substances including fuels, oils etc. Refuelling of vehicles/machinery will only be carried out within the bunded area. • A project ecologist will be appointed and be consulted in relation to all onsite drainage during construction works. Consultation with the project ecologist will not involve the formulation of new mitigation measures for the purposes of protecting any European Site, and relate only to the implementation of those mitigation measures already stated in the submission or the formulation of mitigation for other purposes. • Dewatering of excavations may be necessary. Appropriate monitoring of groundwater levels during site works will be undertaken. Standard construction phase filtering of surface water for suspended solids will be carried out. Unfiltered surface water discharges or runoff are not permitted from the site into the Rathgory Tributary or Dee River during the works. Trenched double silt fencing shall be put in place along boundary of the proposed development site with 10m buffer from the Rathgory Tributary. This fencing will be in place as one of the first stages on site and prior to the full site clearance. The silt fencing will act as a temporary sediment control device to protect the watercourse from sediment and potential site water runoff but also act as a tree protection zone for the riparian buffer. The fencing will be inspected twice daily, based on site and weather conditions, for any signs of contamination or excessive silt deposits. • Concrete trucks, cement mixers or drums/bins are only permitted to wash out in designated wash out area greater than 50m from sensitive receptors including drains and drainage ditches. • Abstraction of water from watercourses is not to be permitted. • Spill containment equipment shall be available for use in the event of an emergency. The spill containment equipment shall be replenished if used and shall be checked on a scheduled basis. • All site personnel will be trained in the importance of good environmental practices including reporting to the site manager when pollution, or the potential for pollution, is suspected. All persons working on-site will receive work specific induction in relation to surface water management and run off controls. Daily environmental toolbox talks / briefing sessions will be conducted to outline the relevant environmental control measures and to identify any environment risk areas/works. • Environmental risks due to construction and operation of the proposed development do potentially exist, particularly in relation runoff from sloping site, drains that could lead to the Rathgory Tributary. Ecological supervision will be required during diversion, excavation and enabling works stages. Silt interception measures will need to be in place to ensure that the watercourses are not impacted during works and in particular during the

site clearance, in-stream works and reprofiling stages. Landscaping of the grassed areas of the site proximate to the Rathgory Tributary should take place immediately following re-profiling, to act as a buffer to protect the watercourse.

- Daily turbidity monitoring of the Rathgory Tributary (upstream, downstream of works) should take place during works in consultation with the project ecologist. This would be particularly important following high rainfall events. It is recommended that sufficient baseline readings are made prior to construction commencing to understand the existing turbidity on site particularly in the pond area as this appeared turbid during the site visit.

Air & Dust

Dust has the potential to enter the Rathgory Tributary via air or surface water with potential downstream impacts. Mitigation measures will be carried out reduce dust emissions to a level that avoids the possibility of adverse effects on the Rathgory Tributary. The main activities that may give rise to dust emissions during construction include the following:

- Excavation of material;
- Materials handling and storage;
- Movement of vehicles (particularly HGV's) and mobile plant.
- Contaminated surface runoff

Mitigation measures to be in place:

- Following the diversion works, maintain the existing 10m buffer with the Rathgory Tributary with a double layer of silt fences
- Consultation will be carried with an ecologist throughout the construction phase;
- Trucks leaving the site with excavated material will be covered so as to avoid dust emissions along the haulage routes.
- Speed limits on site (15kmh) to reduce dust generation and mobilisation.
- The stream is to be protected from dust on site. This may require additional measures in the vicinity of the building during demolition e.g. placing of terram/protective material over the stream.

Site Management

- Regular inspections of the site and boundary should be carried out to monitor dust, records and notes on these inspections should be logged.
- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
- Make the complaints log available to the local authority when asked.
- Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.

Monitoring

- Undertake daily on-site and off-site inspection, where receptors are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces within 100 m of site boundary, integrity of the silt control measures, with cleaning and / or repair to be provided if necessary.

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.
- Fully enclose specific operations where there is a high potential for dust production and the site is active for an extensive period.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
- Cover, seed or fence stockpiles to prevent wind whipping.
- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic.
- Any road that has the potential to give rise to fugitive dust will be regularly watered, as appropriate, during dry and/or windy conditions.
- Maintain a vegetated strip and vehicle exclusion zone between the works and the Rathgory Tributary in consultation with the project ecologist.

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.

Waste

- Avoid bonfires and burning of waste materials.

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.
- Due to the proximity of the Rathgory Tributary an ecologist will oversee works in particular the excavation of material from the perimeter of the site.
- The Contractor will be required to consult with an ecologist prior to the beginning of works to identify any additional measures that may be appropriate and/or required.

Storage/Use of Materials, Plant & Equipment

		<ul style="list-style-type: none"> • Materials, plant and equipment shall be stored in the proposed site compound location; • Plant and equipment will not be parked within 50m of the Rathgory Tributary at the end of the working day; • Hazardous liquid materials or materials with potential to generate run-off shall not be stored within 50m of the Rathgory Tributary. • All oils, fuels and other hazardous liquid materials shall be clearly labelled and stored in an upright position in an enclosed bunded area within the proposed development site compound. The capacity of the bunded area shall conform with EPA Guidelines – hold 110% of the contents or 110% of the largest container whichever is greater; • Fuel may be stored in the designated bunded area or in fuel bowsers located in the proposed compound location. Fuel bowsers shall be double skinned and equipped with certificates of conformity or integrity tested, in good condition and have no signs of leaks or spillages; • Smaller quantities of fuel may be carried/stored in clearly labelled metal Jeri cans. Green for diesel and red for petrol and mixes. The Jeri cans shall be in good condition and have secure lockable lids. The Jeri cans shall be stored in a drip tray when not in use. They will not be stored within 50m of the Rathgory Tributary; • Drip trays will be turned upside down if not in use to prevent the collection of rainwater; • Waters collected in drip trays will be assessed prior to discharge. If classified as contaminated, they shall be disposed by a permitted waste contractor in accordance with current waste management legal and regulatory requirements; • Plant and equipment to be used during works, will be in good working order, fit for purpose, regularly serviced/maintained and have no evidence of leaks or drips; • No plant used shall cause a public nuisance due to fumes, noise, and leakage or by causing an obstruction; • Re-fuelling of machinery, plant or equipment will be carried out in the site compound as per the appointed Construction Contractor re-fuelling controls; • The appointed Construction Contractor EERP will be implemented in the event of a material spillage; • All persons working will receive work specific induction in relation to material storage arrangements and actions to be taken in the event of an accidental spillage. Daily environmental toolbox talks / briefing sessions will be conducted for all persons working to outline the relevant environmental control measures and to identify any environment risk areas/works. • Consultation with Inland Fisheries Ireland will be carried out pre and post works is essential and to be led by the project ecologist.
<p>Birds (National Protection)</p>	<ul style="list-style-type: none"> • Removal nesting habitat. • Removal foraging habitat. • Destruction and/or disturbance to nests (injury/death). • Predation . 	<ul style="list-style-type: none"> • Retain hedgerows and trees where possible. • Wildlife corridors provide additional shelter to minimise predation. • “Relevant guidelines and legislation (Section 40 of the Wildlife Acts, 1976 to 2012) Should this not be possible, a pre-works check by a qualified ecologist should be undertaken to ensure nesting birds are absent. This would include nesting gulls on buildings if present. • Nest boxes places on site to compensate for resource loss. • Removal of potential nesting habitats outside of bird breeding season (March to August inclusive). Should this not be possible, a pre-works check by a qualified ecologist should be undertaken to ensure nesting birds are absent. • Planting will provide suitable cover for nesting birds and encourage insect diversity that would sustain birds. • An annual crop established each spring with a high proportion of spring cereals (wheat, barley and/or triticale) in the seed mix will be best for yellowhammers and other buntings. Linseed or a brassica, such as rape or mustard, will broaden the benefits for finches and other seed-eating birds.

		<ul style="list-style-type: none"> • Create grass margins around arable fields to increase food and nesting habitat for yellowhammers. • Bird boxes shall be provided (25). These shall include boxes suitable for robins and blue tits. Vegetation will provide continued nest sites for other bird species. • Light falling upon any areas of benefit to birds such as hedgerow will not exceed 3 lux to ensure that resting and nesting species are not unnecessarily disrupted.
Bats (international Protection)	<ul style="list-style-type: none"> • Removal roosting/foraging habitat. • Lighting Impacts 	<ul style="list-style-type: none"> • Pre Construction survey for bats • Retain hedgerows and ivy cover on trees where possible. • Wildlife corridors provide additional shelter to minimise predation. • Ecologist notified if bats found during demolition • Lighting at all stages should be done sensitively on site with no direct lighting of hedgerows and treelines. • Replanting of the riparian corridor at phase 1 of the project.
Hedgerows and Treelines (Local importance)	<ul style="list-style-type: none"> • Loss of commuting habitat. •Injury/death during construction and operation 	<ul style="list-style-type: none"> • Retain hedgerows and ditches where possible. Compensatory planting will be carried out on site. • Wildlife corridors maintain landscape connectivity and provide additional shelter. • As outlined in the Arboricultural Impact Assessment “The loss of trees has been taken into consideration and a detailed landscape proposal that includes the planting of new high-quality trees has been proposed. This new planting will, in the medium to long term, have a positive impact on the visual appearance of the development and will significantly increase tree cover within the site and local area.” In addition, significant consultation was carried out with between the ecologists, lighting and landscape consultants in relation to enhancing biodiversity on site and ensuring bat foraging is maintained along the watercourse. Therefore it is essential that the landscape strategy is carried out in full.

4.10.5 Adverse Effects likely to occur from the project (post mitigation)

Standard construction and operational mitigation measures are proposed. These would ensure that water entering the Rathgory Tributary, is clean and uncontaminated. However, given the proximity of numerous sensitive receptors and the watercourse leading to the Natura 2000 sites, it should be noted that the early implementation of ecological supervision on site and consultation with IFI at initial mobilisation and enabling works is seen as an important element to the project, particularly in relation to the implementation of surface water runoff mitigation. A NIS accompanies the EIAR.

With the successful implementation of standard mitigation measures to limit surface water impacts on the Rathgory Tributary, biodiversity mitigation/supervision and the successful installation and initiation of the foul treatment system, no significant impacts are foreseen from the construction or operation of the proposed project (Table 4_6). Residual impacts of the proposed project will be localised to the immediate vicinity of the proposed works. Positive impacts would be seen through the implementation of an improved riparian corridor with greater potential for biodiversity than currently exists on site. There will be a reduction in green space that will reduce feeding for birds. The impact of this will be reduced by a planting regime that encourages insect diversity but there is potential for a long-term slight negative impact due to the loss of cereal crop availability and hedgerow loss.

The construction and operational mitigation proposed for the development satisfactorily addresses the mitigation of potential impacts on biodiversity and designated conservation sites through the application the standard construction and operational phase controls as outlined above. In particular, mitigation measures to ensure compliance with Water Pollution Acts and prevent silt and pollution entering the stream will satisfactorily address the potential impacts on downstream biodiversity and Natura 2000 sites. No significant adverse impacts on the conservation objectives of Natura 2000 sites are likely following the implementation of the mitigation measures outlined above.

It is essential that these measures outlined are complied with, to ensure that the proposed development does not have “*downstream*” environmental impacts. These measures are to protect the groundwater/surface water, which are potentially the primary vectors of impacts from the site, and ensure that it is not impacted during construction and /or operational phases of the proposed development. Ongoing consultation with IFI is essential.

Table 4_6a. Construction Impacts on habitats and sensitive receptors post mitigation

Habitat	Habitats Directive	Site Rating ¹	Construction Impact	Impact Significance
Watercourses		C	Silt or petrochemicals entering the Rathgory Tributary and River Dee. Mitigation measures will be put in place to avoid impacting this habitat through the introduction of silt or petrochemical protection measures.	Positive Long term
Scrub		E	Construction will result in the complete removal of this habitat.	Negligible
Recolonising Bare Ground/Bare Ground		E	No species of importance were noted on, or in, this habitat. No bat roosts were noted on site. The removal of this habitat will not result in the loss of species of importance.	Negligible
Hedgerows and Treelines		E	No species of importance were noted on, or in, the buildings or artificial surfaces. No bat roosts were noted on site. The removal of this habitat will not result in the loss of species of importance. Replanting of removed hedgerows will be carried out so as not to encourage tunnelling of the stream, but retain the foraging corridor for bats.	Positive in the long term
Natura 2000 and other conservation sites.	Yes	C	Silt or petrochemicals entering the Rathgory Tributary and River Dee. Mitigation measures will be put in place to avoid impacting this habitat through the introduction of silt or petrochemical protection measures (See Mitigation and NIS).	Negligible

Table 4_6b. Construction Impacts on species

Species	Site Rating	Construction Impact	Impact Significance
Mammals-Terrestrial	A-D	No other terrestrial mammals of conservation importance were noted on site. No badger activity or setts were noted. No otter activity or holts were noted. Lighting will be controlled towards River Dee and Rathgory Tributary.	Negligible
Birds	D	Clearance of the site will result in the loss of nesting habitat. Subsequent planting and inclusion of bird boxes, could result in a positive impact.	Negligible/positive long term
Amphibians-Frogs	B	Evidence of frog activity was not noted on site.	Negligible
Terrestrial Flora	-	No flora of conservation significance were found on the site.	Negligible

Table 4_6c. Operation Impacts on habitats and sensitive receptors post mitigation

Habitat	Site Rating	Operational Impact	Impact Significance
Watercourses	C	The watercourse and riparian buffer will become a focus of the development which would be seen as a positive. However, there may be increased disturbance of the area with potential for interaction with the watercourse.	Positive/Neutral
Recolonising Bare Ground/Bare Ground	E	Construction will result in the complete removal of this habitat. It is not expected that the new site will not contain this habitat.	Negligible

¹ Site ecological evaluation rating: <https://www.tii.ie/technical-services/environment/planning/Guidelines-for-Assessment-of-Ecological-Impacts-of-National-Road-Schemes.pdf>

Hedgerows and Treelines	Public lighting will not be located in the vicinity of this area.	Neutral
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Table 4_6d. Operational Impacts on species

Species	Site Rating	Operational Impact	Impact Significance
Mammals-Terrestrial	A-D	No other terrestrial mammals of conservation importance were noted on site.	Negligible based on mitigation
Birds	D	Subsequent planting could result in a positive impact.	Minor Adverse/ localised/short-term
Amphibians-Frogs	B	Evidence of frog activity was not noted on site. Mitigation measures including the improvement of the riparian corridor should be put in place prior to development construction.	Minor Adverse/ localised/short-term
Terrestrial Flora	-	No flora of conservation significance was found on the site.	Negligible
Aquatic Fauna		The successful implementation of landscape features are important to the biodiversity value of the watercourse.	Negligible based on controls.

4.10.6 Residual Impacts Conclusion

The construction and operational mitigation proposed for the development satisfactorily addresses the mitigation of potential impacts on the sensitive receptors through the application the standard construction and operational phase controls. The overall impact on the ecology of the proposed development will result in a long term slight positive residual impact on the ecology of the area and locality overall. This is primarily as a result of the loss of terrestrial habitats on site, supported by the creation of an improved biodiversity focused riparian corridor, additional biodiversity features, standard construction and operational controls and a sensitive native landscaping strategy. The implementation of SUDS drainage on site and riparian features in consultation with IFI would be seen as beneficial to the Rathgory Tributary.

4.11 Monitoring

An ecologist will be appointed prior to enabling works commencing on site and oversee all works.

4.12 Reinstatement

Reinstatement of the site will be carried out following the construction phasing. All reinstatement will be overseen by the project ecologist and will be carried out as per landscape plan.

4.13 Interactions

The biodiversity elements of this EIAR have involved consultation with a wide section of the Project Team particularly in relation to the mitigation proposed, Construction Management, design, lighting, drainage and landscape elements of the proposed development. There are numerous inter-related environmental topics described in detail throughout this EIAR document which are of relevance to the biodiversity chapter. The biodiversity chapter of the EIAR involves interactions with Chapter 5 - Lands & Soils, Chapter 6 – Water, Chapter 7 – Air Quality & Climate, Chapter 8 – Noise & Vibration, Chapter 9 – Landscape, Chapter 10 – Material Assets – Traffic, Chapter 11 - Material Assets – Waste Management and Chapter 12 – Material Assets – Utilities. It is considered that there is the potential for slight, temporary negative impacts on biodiversity due to dust (air), noise, emissions to water and construction traffic associated with the Construction Phase of the proposed Project. These impacts are addressed in more detail in the other chapters of the EIAR. There is also potential for the Operational Phase of the proposed development to impact on biodiversity via water. However, post mitigation these impacts are not deemed to be significant.

4.14 Difficulties Encountered in Compiling

No difficulties were encountered during the preparation of the Biodiversity Chapter.

5.0 LAND AND SOILS

5.1 INTRODUCTION

This section of the EIAR has been prepared by Cronin and Sutton Consulting Engineers and describes the existing land and soils, including geology & hydrogeology, within the subject site. An assessment is made of the likely impacts on these elements arising during the site clearance, construction, and operational phases of the proposed development.

This chapter was prepared by Robert Fitzmaurice of CS Consulting. Robert is a Chartered Engineer with Engineers Ireland and has been practicing as a consulting engineer for over twenty years. Robert holds an undergraduate degree in Civil & Environmental Engineering, a postgraduate Diploma in Environmental Engineering, an advanced Diploma in Planning & Environmental Law and has a master's degree in Industrial Engineering.

The following guidelines were consulted in the preparation of this chapter.

- Guidelines for the Preparation of Soil, Geology and Hydrogeology Chapters of Environment Impact Statements (Institute of Geologists of Ireland (IGI) 2013);
- Revised Guidelines on the Information to be contained in Environmental Impact Statements (EPA 2015a);
- Advice Notes for Preparing Environmental Impact Statements (EPA 2015b);
- Draft Guidelines on the Information to be contained in Environmental Impact Assessments Reports (EPA 2017);
- Construction Industry Research and Information Association (**CIRIA**) *Control of Water Pollution from Construction Sites* (2001);
- CIRIA *Environmental Handbook for Building and Civil Engineering Projects* (2000).
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report, European Commission, 2017

5.2 STUDY METHODOLOGY

The site, which is the subject of this application, is undeveloped. An assessment of the soils and bedrock geology underlying the study area was undertaken in the form of a desktop study using information from the Geological Survey of Ireland (GSI). An assessment of the existing groundwater underlying the study area was undertaken in the form of a desktop study using information available from the Geological Survey of Ireland (GSI).

Specific geological information was obtained from site investigations undertaken at the proposed development site in December 2021 by Ground Investigations Ireland (GII project ref. 10716-06-21). The corresponding Report (issued to Cronin and Sutton Consulting Engineers by Ground Investigation Ireland in December 2021, respectively) is attached as **Appendix 5.1** at Volume III of this EIAR.

5.3 EXISTING RECEIVING ENVIRONMENT

The geological setting for the proposed works has been reviewed based on available desktop data from the Geological Survey of Ireland, (www.gsi.ie) and from intrusive site work carried out to support this assessment. The assessment looked at the current geological setting and the implications the proposed works may have on same. Set out below is the geological framework followed.

Geology

The geology of the subject site and the surrounding area is interpreted from information from the Geological Survey of Ireland (GSI) and the Site Investigation carried out. The site and surrounding areas' sequence of strata consists of:

- Topsoil,
- Made Ground,(deposits of *brown sandy slightly gravelly CLAY* with cobble and boulders)
- Cohesive Deposits, (*brown sandy gravelly CLAY with occasional cobbles and boulders overlying a stiff sandy gravelly CLAY with occasional cobble and boulders*)
- Granular Deposits, (*brown clayey sandy angular to subangular fine to coarse GRAVEL with occasional cobbles and boulders*)
- Bedrock. (lands straddle two geological areas, to the west: *Dark Limestone, Mudstone & Sandstone* which forms part of the '**Navan Beds**' formation. And to the east, *Calcareous Red-mica 'Greywacke'* which forms part of the '**Clontail Formation**')

A summary of the ground conditions encountered in the site investigation is outlined in **Table 5.1** below:

Table 5.1: Typical Ground Conditions

Stratum Type	Average Depths (BGL)
Made Ground	0.1m to 2.8m
Granular Deposits (Sands and Gravels)	0.9m to 2.1m
Cohesive Deposits (Clay Subsoils)	1.0m to 2.5m and below
Bedrock	not encountered above 3.0m BGL

It is noted that the subject site is located within the 'Ardee-Newtown Bedform Field' County Geological Site (CGS), as defined in Section 8.8 of the *Louth County Development Plan 2021-2027*. The Development Plan characterises a CGS as an area that has not been selected as a proposed Natural Heritage Area (pNHA) but "which, although of lesser importance, nonetheless should be protected".

The 'Ardee-Newtown Bedform Field' CGS is extensive, and the subject site is located in a peri-urban area at its northern extremity. The proposed development of the site is not considered to pose any threat to this CGS, given that the subject site includes significant elements of made ground and that no geological features have been recorded on site within 3m of the existing ground level.

Historical maps maintained by the Ordnance Survey of Ireland (OSI) and the google imagery records were reviewed. These included the 6-inch maps that were produced between 1829 and 1842, the 25-inch maps that were produced between 1888 and 1913 and the 6-inch Cassini Maps that were produced between the 1830's and 1930's.

There is a quarry indicated in on the site on all historical maps reviewed. The quarry is identified as being a disused gravel pit on the 25-inch map. Based on a review of the OSI and Google Imagery aerial photograph records the quarry had been backfilled at some stage in the field's development. A review of the aerial imagery indicates that the site remained largely undeveloped between the backfilling of the quarry and the beginning of a residential development to the north of the site between 2018 and 2019. The site appears to have been backfilled with excess soils and stone generated as part of that residential development.

Hydrogeology

A review of the Geological Survey of Ireland database gives the local hydrogeological regime as follows:

- *Groundwater Vulnerability defined as HIGH,*
- *Locally Important Aquifer,*
- *Bedrock is moderately productive in local zones only.*

It is not proposed to discharge any wastewater to the subsoil or to use groundwater resources for potable water supply. The ground water flows from north and south into the existing stream which crosses the site and provides a baseflow for same. See **Appendix 5.2** of this EIAR for GSI geological & hydrogeological maps.

5.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

A full description of the proposed development is provided in Chapter 2 of this EIAR. Briefly, the development proposals constitute the 4th phase to the permitted residential development (phases 1-3), currently under construction at Bridgegate, comprising:

- 50no. 2-bedroom houses,
- 145no. 3-bedroom houses,
- 11no. 4-bedroom houses,
- 17no. 1-bedroom duplex units,
- 24no. 2-bedroom duplex units,
- 25no. 3-bedroom duplex units,
- 484sqm GFA crèche (100no. childcare places and 17no. staff),
- 165sqm community centre building.

The proposed development also includes a series of public open spaces (c. 1.8ha) and a c. 3.6ha public park on the northern part of the site.

5.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

5.5.1 Potential Impact on Soils, Subsoils and Bedrock

Site Clearance

The potential impact pertaining to the proposed development with regard to land & soil involves the removal and reprofiling the site, and where required the excavation and disposal of surplus material. The potential impacts potentially are:

- air quality issues (dust) as a result of site excavation,
- noise issues due to on site excavation,
- subsidence issues regarding adjacent landowners, due to excavation works,
- increase in temporary local traffic volumes due to removal of excavated spoil material,
- reduction in regional landfill capacity due to acceptance of classified waste material.

Construction Phase

The principal potential impacts associated with the Construction Phase are:

- The potential presence of contaminants in the underlying strata and the exposure of site workers to contaminated ground through direct contact, inhalation of dust and vapours or oral intake.
- 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. The area of the site which shall be affected by re-development is in the order of 77,519.8m². As part of the detailed design carried out for the proposed development the volume of cut material generated on site will be 42,096m³. While fill material required for the development has been calculated to be 7,865m³, therefore the difference between the two, 34,231m³ will be required to be removed from site.
- Noise and vibration will be generated through the construction phase particularly during piling and excavation work. Given that some rock excavation is required it is anticipated that rock breaking techniques will be used. Noise and vibration impacts are considered in detail in **Chapter 8 - Noise and Vibration**.
- The removal of soil from the ground could, without the adoption of appropriate control measures, lead to some ground movement in the immediate surrounds of the excavation with an associated risk of settlement and damage to buildings in the immediate area. Details of mitigation methods are outlined in the next section.
- The presence of contaminants in the groundwater and the exposure of site workers to existing contaminated groundwater.
- A potential risk to human health due to the associated works during construction is the direct contact, ingestion or inhalation of receptors (i.e. construction workers) with any soils which may potentially contain low level hydrocarbon concentrations from Site activities (potential minor leaks, oils and paint).
- No human health risks associated with long term exposure to contaminants (via. direct contact ingestion or inhalation) resulting from the proposed development are anticipated.
- There is a potential risk of localised contamination of the groundwater due to construction activities i.e. from accidental spillages, leaks etc. resulting in a potential Permanent Negative impact on the groundwater (in the absence of mitigation).

Operational Phase

During the operational phase of the proposed development on the subject site it is envisaged that there will be an imperceptible permanent neutral effect on the geology of the area or on groundwater.

Run-off from hardstanding areas will pass through a closed drainage system, which will incorporate silt traps and oil/petrol interceptors, to mitigate the possibility of potentially contaminated surface water contaminating the soil and bedrock geology. This drainage system will then discharge into the local water course. It is not predicted that there will be any adverse effects on the soils and geology during the operational phase of the development.

The development will be supported by the underlying ground conditions through direct ground bearing. It is not envisaged that this will have any negative impact on the bedrock geology.

On completion of the construction phase, it is not envisaged that there would be a further direct impact on the soil or geology structure. Ensuring appropriately designed and constructed site services will protect the soils and geology from future contamination arising from operation of the developments.

The effects of the development's operational phase on soils and geology will be neutral in quality, imperceptible in significance, and permanent in duration.

7.5.2 Cumulative Impacts

Cumulative impacts on the proposed development have been considered, along with phases 1 – 3 on adjacent sites under the control of the applicant. The combined effects of the phases currently planned and under construction were considered and have been deemed to be neutral.

As part of the proposed works excess material generated on site will be required to be removed and sent to a licenced landfill facility. The material will be categorised in accordance with current waste management requirements. The material will reduce the available capacity in regional landfills.

Separate Irish Water upgrade works are needed to facilitate development in general in Ardee, including the subject lands, but do not form part of this application. As part of the Confirmation of Feasibility CDS20003735 that forms part of this application, Irish Water note the following:

“The existing wastewater network will require upgrades to cater for the additional proposed load. The upgrade will involve upsizing of between 300 and 1000 meters of existing 225mm sewer along the public road. It is not expected that 3rd party permissions will be required outside the requirements for a road opening licence. The exact details of this upgrade can be agreed at connection application stage.”

The replacement/upsizing of the sewerage infrastructure by Irish Water to facilitate the proposed development would require works to the public road. These will involve the excavation of the existing pipeline and surround along the length of its route, which will be replaced with upgraded pipelines with granular fill surround. The top of the trench will comprise standard backfilled material and road coverings. During excavation works for the pipeline, there is potential for entry of sediment-laden runoff to the Rathgory Tributary if appropriate mitigation measures are not put in place. The construction of the pipelines will be to Irish Water specifications and the construction management (including the implementation of appropriate mitigation measures) will ensure that there are no significant impacts arising.

5.6 DO NOTHING IMPACT

The “Do Nothing Impact” assesses the environmental impact of not redeveloping the proposed development site in respect of the existing impacts to land and soils, at the proposed site. Under the “Do Nothing Scenario” there would be no change in the current land use of the site and therefore the soil and bedrock geology environments would remain in their current state.

5.7 AVOIDANCE, REMEDIAL AND MITIGATION MEASURES

5.7.1 Mitigation Measures

Site Clearance Phase

Mitigation measures for the site clearance phase will be as detailed in Chapter 11 of this EIAR and as outlined in the *Construction & Demolition Waste Management Plan* prepared by AWN Consulting and submitted as part of this planning application. Any spoil generated on site during site clearance and enabling works will be segregated and assessed to establish its suitability for reuse or recycling. Some waste material generated on site will not be suitable for reuse or recycling and therefore will be required to be removed from site and disposed of in accordance with current legislation. Waste material taken from site deemed to be inert or non-hazardous will be committed to a regional landfill.

Construction Phase

The most significant potential impacts of the proposed development are those associated with its construction phase. Mitigation measures relating to such impacts are outlined below and in the *Outline Construction Management Plan* prepared by CS Consulting:

- The excavated material will be monitored and assessed to determine the most suitable disposal outlet. Material will be categorised according to the Landfill Directive and will be sent to appropriately licensed facilities for treatment/disposal. This will entail carrying out soil analysis to determine the appropriate waste facility for disposal. Where applicable, material on site will be segregated and divided into material re-use, material re-cycling and waste material streams in accordance with current guidelines and best practice.
- Dust suppression measures will be implemented to minimise dust generation during extended dry periods. Dust monitoring will be conducted through the excavation period. The provision of vehicle wheel wash facilities at site exits and implementation of a road sweeping programme will reduce effects on the surrounding road network.
- Inherent in any redevelopment is the potential for groundwater from the clearance/demolition and construction phases of the project to contribute to contamination of the local groundwater. By developing a detailed construction methodology and strict adherence to this policy by vigilant site management, these potential risks can be mitigated to acceptable levels.
- During the site clearance and excavation phases of the works, monitoring will be ongoing for noise, vibration, settlement, gas & water levels as well as ground contamination as described in the section below on Monitoring.
- Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development.
- At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas.
- Topsoil stockpiles will be protected for the duration of the works and not located in areas where sediment laden runoff may enter existing surface water drains.
- Topsoil stockpiles will also be located on site so as not to necessitate double handling.
- Topsoil will be re-used where possible within the subject site in suitable locations to reduce the requirement to take material off site.
- The design of road levels and finished floor levels has been carried out to minimize cut/fill type earthworks operations.
- Disturbed subsoil layers will be stabilized as soon as practicable. Therefore, backfilling of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping, will all be carried out promptly to minimise the duration that subsoil layers are exposed to the effects of weather.
- Similar to comments regarding stripped topsoil, stockpiles of excavated subsoil material will be protected for the duration of the works. Stockpiles of subsoil material will be located separately from topsoil stockpiles.
- Measures will be implemented to capture and treat sediment laden surface water runoff (e.g. sediment retention ponds, surface water inlet protection and earth bunding adjacent to open drainage ditches).
- Where feasible, excavated material will be reused as part of the site development works (e.g. for landscaping works and for backfill in trenches under non trafficked areas).
- No mitigation measures are required in relation to hedgerows as the impact is considered to be slight as the development layout has minimised impact on existing hedgerows.
- Earthworks plant and vehicles delivering construction materials to site will be confined to predetermined haul routes around the site.

- Construction site mitigation such as wheel wash and dust suppression measures will be implemented as part of the construction process and will be detailed in the appointed contractor's construction management plan.
- All oils, fuels, paints and other chemicals will be stored in a secure bunded hardstand area.
- Refuelling and servicing of construction machinery will take place in a designated hardstanding area, remote from surface water inlets (when it is not possible to carry out such activities off-site).
- It is unlikely that bedrock will be exposed during construction works. Deep drainage works will be avoided where possible to reduce the possibility of impacting on bedrock. Should bedrock be encountered, the extent of exposed bedrock will be limited to the immediate vicinity of active work areas. Where bedrock is encountered it will be crushed, screened and tested for use within the designed works to reduce the volume of material required to leave site. This will also reduce the volume of material to be imported to the site.
- The Outline CMP contains measures to ensure that accidental spillages will be appropriately dealt with, which includes a response procedure to deal with any accidental pollution events. Spillage kits shall be available and construction staff will be familiar with the emergency procedures and use of the equipment.

Operational Phase

During the operational phase it is anticipated that the development will create additional impermeable surface areas.

All new drainage on site will be pressure tested and have a CCTV survey carried out prior to being made operational. Source control measures such as swales, gully connections to tree pits and permeable paving will be used to provide initial treatment and interception of surface water. Further treatment will be provided in the open bottomed attenuation facilities and petrol interceptors before final discharge to the surface water outfalls.

Oil interceptors will be provided in order to prevent runoff of pollutants to the soils and sub soils. The use of interceptors will be in compliance with Pollution Prevention Guidelines (PPG) 3. No detergents will be discharged to interceptors as per current best practice.

All residential car park areas will have permeable paving. It will reduce surface runoff, trap suspended solids therefore filtering pollutants from stormwater which will improve water quality by filtering pollutants in the substrata layers.

Worst Case Scenario

As with any form of construction activity there is an inherent risk that the works performed on site may lead to unforeseen issues developing. There is therefore potential for the proposed site excavation works to cause on site or offsite issues. These issues may take the form of land slippage caused by the excavations, increased dust raising during soil transportation or heightened health and safety concerns during the works.

Under a 'worst case' scenario, the accidental release of fuel, oil, paints or other hazardous material occurs on site during the construction phase, through the failure of secondary containment or a material handling accident on the site. If this were to occur over open ground, then these materials could infiltrate through the soil contaminating the soil zone. If the materials were not recovered promptly, then the contaminants may contaminate the down gradient groundwater and surface water receptors (Rathgory Tributary).

Worst case scenarios envisioned are extreme occurrences of the potential impacts identified above in conjunction with failure of mitigation measures including:

- Significant contamination event
- Ground instability affecting adjacent properties

Given the scale of the site and relatively standard nature of the works involved the likelihood of a “worst case” event is extremely low.

5.8 MONITORING

It is recommended that the following are monitored in relation to the soil and geological environments during the site clearance and construction stages:

- Testing and monitoring of soil and made ground that will be excavated for any potentially contaminated material to ensure adequate classification and disposal.
- Monitoring of the retaining wall using for example, inclinometers and monitoring of water movements either seepages or through control points.
- Monitoring of neighbouring structures immediate to the development site for the effects of any vibration, movement and settlement arising from the excavation works based on condition surveys carried out by the Contractor prior to the works.
- Monitoring of interrelated impacts such as noise and vibration levels, groundwater levels, dust emissions etc. are dealt with in their other chapters in this EIAR.
- Testing and monitoring of water and gas during excavation works.
- Monitoring of water movements either seepages or through control points.

5.9 REINSTATEMENT

Any temporary construction compounds will be removed from the site following the end of the construction phase. Reinstatement at completion of the works will involve removal of all deleterious materials that may have been deposited during construction works and restoring any areas within the public realm/pedestrian corridor with an appropriate and acceptable hard-wearing layer. Oil, fuel etc. storage areas are to be decommissioned on completion of the construction phase. Any remaining liquids are to be removed from site and disposed at an appropriate licenced facility.

All sediment control measures (e.g. sediment retention ponds) are to be decommissioned on completion of the construction phase. Such areas are to be reinstated in accordance with the landscape architects plan and engineer’s drawings.

5.10 INTERACTIONS

The impacts described previously in this Chapter also relate to and interact with other chapters within the EIAR, specifically: Population and Human Health, Water, Biodiversity, Noise and Vibration, Air Quality & Climate and Material Assets. These impacts are described in more detail in the various corresponding chapters however some general points are described below:

- There is a potential for dust from site clearance work and excavations or stockpiles to impact on air quality/human beings.
- Noise and vibration will be generated through the Construction Phase particularly during excavation works.
- In the highly unlikely event that construction workers are exposed to any contaminants present in the underlying strata through direct contact and inhalation of dust and vapours.

In assessing the impact on land and soils, we have also considered and had regard to the following:

- An Assessment Report prepared by Ground Investigations Ireland (GII Ref. 10716-06-21), included within **Appendix 5.1** to this EIAR;
- The *Construction and Demolition Waste Management Plan* and *Outline Construction Management Plan* prepared in support of this application; and
- Mitigation measures presented in the EIAR.

5.11 DIFFICULTIES ENCOUNTERED IN COMPILING

The soil and geology profiles described are extracted from available site investigation information which uses testing and observation of a sample within boreholes and trial pits to give an overall representation of the site. The assumptions made regarding the site are based on this available information only and cannot account for localised areas which differ however unlikely. There was no available information to confirm the existence of or the extent of contamination and therefore assumptions are based on the known historical land use of the proposed development site and the surrounding area. However, the mitigation measures proposed during the site clearance and construction stages will ensure that if any contamination is identified it will be addressed to ensure no adverse impacts on the environment. This will include monitoring & testing of materials to be removed from site following segregation of waste materials. Waste materials will be assessed in accordance with relevant waste classification and waste disposal legislation.

5.12 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

The predicted impacts on the subject lands soils & geology during the construction and operational phases are deemed to be *neutral & not significant*, when reviewed against the development proposal. The proposed monitoring and mitigation measures will ensure that the development will not have a temporary or lasting effect on this medium.

6.0 WATER (HYDROLOGY, WATER SUPPLY, SURFACE WATER DRAINAGE, FOUL WATER DRAINAGE)

6.1 INTRODUCTION

This section of the EIAR has been prepared by Cronin and Sutton Consulting and describes the existing hydrology and drainage environment on the proposed development site. An assessment is made of the likely impacts on these elements arising during the site clearance, construction, and operational phases of the proposed development.

This chapter was prepared by Robert Fitzmaurice of CS Consulting. Robert is a Chartered Engineer with Engineers Ireland and has been practicing as a consulting engineer for over twenty years. Robert holds an undergraduate degree in Civil & Environmental Engineering, a postgraduate Diploma in Environmental Engineering, an advanced Diploma in Planning & Environmental Law and has a master's degree in Industrial Engineering.

6.2 STUDY METHODOLOGY

In preparing this report, CS Consulting has made reference to the following:

- Louth Development Plan 2021 - 2027;
- Regional Code of Practice For development works, Version 6;
- Irish Waters Code of Practice for Water Infrastructure;
- Irish Waters Code of Practice for Wastewater Infrastructure;
- Greater Dublin Strategic Development Study.
- Historical Flood Data, obtained from the national hazard Mapping Website, (www.opw.ie);
- CIRIA C753 – The SuDs Manual.
- *Revised Guidelines on the Information to be contained in Environmental Impact Statements* (EPA 2015a);
- *Advice Notes for Preparing Environmental Impact Statements* (EPA 2015b);
- *Draft Guidelines on the Information to be contained in Environmental Impact Assessments Reports* (EPA 2017);
- Department of Housing, Planning & Local Government (2018). Guidelines for Planning Authorities & Bord Pleanála on Carrying Out environmental Impact Assessments;
- The Planning System and Flood Risk Management, Guidelines for Planning Authorities, Former Dept of Environment, Heritage & Local government, (Government of Ireland 2009);
- Guidelines on Protection of Fisheries During Construction Works in and adjacent to Waters (IFI, 2016)

Legislation

Water Framework directive – 2000/60/EC

The EU Water Framework Directive (WFD), 2000/60/EC came into force in 2000 and was enacted through SI No. 272/2009 into Irish Legislation. This legislation is very significant for Irish & European policy. Key objectives are:

- Protect all waters, to include for rivers, lakes, groundwaters, coastal & transitional waters.
- To achieve 'good status' in all waters by 2015 and maintaining 'high status' where that status designation has already been achieved,
- Water management should be based on River Basin Districts.

6.3 EXISTING RECEIVING ENVIRONMENT

This sub section addresses the implications for the proposed development on the existing environment and looks at the possible effects the proposed development may have during the construction and operational phases.

Topography

The current subject lands are undeveloped and green field in nature. The site has a high point of 54m AOD to the north falling to a low point of 35mAOD at the location for the existing water course in the centre of the subject lands. From the water course the site rises up as you move further south to a level of 45mAOD. See CS Consulting drawing **Ardee-CSC-00-XX-DR-C-1000** for details of the subject lands current topography.

Hydrology

The topography of the site is such that it drains into a tributary of the River Dee (the Rathgory Tributary), which crosses the site through its midway point. This tributary drains into the River Dee further north of the subject lands. The closest water quality 'Q-Status' monitoring point, (ref: RS06D010680) has a surface water quality value of '4' which is classified as '*good status*'. A review of the water quality status under the *Water Framework Directive*, 2013 – 2018, indicates that the monitoring point, (ref: IE_NB_06D010710), has a designation of '*moderate*'.

Flood Risk

The site has been assessed and the majority of the site is located within Flood Zone 'C'. With a section of the lands to the east located in Flood Zone 'B'. Consultants JBA have carried a detailed *Site Specific Flood Risk Assessment* for the site adhering to the requirements of the National Flooding Guidelines and the Local Authorities requirements.

Groundwater

A review of the geological & hydrogeological conditions for the subject lands was carried out in preparation of this chapter. The reviewed data is available from the Geological Survey of Ireland website, (www.gsi.ie). Information available reveals that the sites subsoil is predominantly a 'deep well drained mineral soil'. South of the site Alluvial mineral soils are present which indicate previous flooding. The underlying bedrock is classified as the *Clontail Formation* which is described as *calcareous red-mica greywacke*. The western boundary of the site is intersected by the *Navan Beds formation* which is described as *dark limestone, mudstone, sandstone*. The associated groundwater vulnerability is classified as '*Moderate*' to '*Extreme*' for the site which indicates that a *high risk* to the groundwater under the site and a bedrock depth of between 3 - 10m. These classifications are based on relevant hydrogeological characteristics of the underlying geological materials.

The GSI website does not indicate historical or a high probability of flooding due to groundwater sources at the subject site.

No existing potable groundwater abstraction wells are located on the subject site.

Existing Services

As the subject lands is currently undeveloped agricultural lands it is not serviced by a foul or storm water sewerage system.

6.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

A full description of the proposed development is provided in Chapter 2 of this EIAR. Briefly, the development proposals constitute an extension to the permitted residential development at Bridgegate, comprising:

- 50no. 2-bedroom houses,
- 145no. 3-bedroom houses,
- 11no. 4-bedroom houses,
- 17no. 1-bedroom duplex units,
- 24no. 2-bedroom duplex units,
- 25no. 3-bedroom duplex units,
- 484sqm GFA crèche (100no. childcare places and 17no. staff),
- 165sqm community centre building.

The proposed development also includes a series of public open spaces (c. 1.8ha) and a c. 3.6ha public park on the northern part of the site.

Surface Water

The proposed development will incorporate a two-fold system to address stormwater management. The *first* aspect of this is to restrict storm water run-off from the site to its current undeveloped, greenfield rate. This will mean that during intense storm water events the storm water generated on site is released at a restricted rate. This rate has been calculated based on the hydrological setting of the subject lands. The allowable discharge from the site has been calculated at 2.07l/ha. During extreme storm events this allowable discharge figure will not increase. Restricting the storm water flow from the site means that on site attenuation storage must be provided to retain the storm water generated on site. The attenuation required is based on the Local Authority's requirement to retain the storm water generated during a 1-in-100-year event, increased by 20% for the predicted effects of climate change. The volume of storm water attenuation required is 2999m³. It is proposed to provide storage for this water by installing a number of underground 'stormtech' tanks to retain the storm water during extreme events and to allow the water to be released under a controlled discharge rate after the storm event has passed. Refer to CS Consulting *Engineering Services Report* for the calculations for same & drawing number **Ardee-CSC-00-XX-DR-C-1002** for the proposed drainage layout.

As part of the proposed works a tributary of the Rathgory stream passes through the subject lands will be required to be re-aligned. These works will also require two culverts to be constructed across it to allow vehicular conductivity. The proposed re-alignment of the tributary and the culverts have been designed to allow sufficient capacity in the system to convey the predicted flows generated from the subject lands in accordance with the requirements of the Office of Public Works. The approval for the culverts will be subject to a 'Section 50' application provided planning permission is granted. In addition to this chapter refer to the *Site Specific Flood Risk Assessment* for the site submitted with this application.

The second aspect that has to be addressed when dealing with stormwater management is to incorporate the general principles of sustainable drainage into the design. At its heart, this approach advocates the improvement in overall stormwater quality prior to its disposal into a watercourse or to allow the storm water to infiltrate into the groundwater table. A range of Sustainable Drainage Systems (SuDS) measures are proposed to ensure that the Council's policy is adhered to. Refer to CS Consulting *Engineering Services Report* for details of same. It is proposed that – following the SuDS measures and attenuation storage – the restricted flow from the site will discharge into the existing water course which crosses the subject lands.

As part of the proposed works, the existing watercourse which crosses the site will be required to be altered to accommodate the proposed development. Agreement with the Office of Public Works will be required for this to be facilitated.

Foul Water

The proposed development will generate a wastewater loading of 121.31m³/day. This equates to 1.40l/sec average flows (DWF) and a peak flow (6* DWF) of 8.42l/sec. It is proposed to discharge this domestic effluent volume into the recently constructed foul network to Irish Water's requirements. As required, a *Pre-Connection Enquiry* was lodged with Irish Water to allow an assessment of the local & regional infrastructure to accommodate the proposed development. Irish Water have indicated their requirements and noted that a formal connection agreement will be required to be entered into the services to be made available. Refer to the Engineering Services Report for a copy of same.

Irish Water's Confirmation of Feasibility reply noted that up-grade works to the local infrastructure outside the proposed development would be required. Irish Water notes:

'The existing wastewater network will require upgrades to cater for the additional proposed load. The upgrade will involve upsizing of between 300 and 1000 meters of existing 225mm sewer along the public road. It is not expected that 3rd party permissions will be required outside the requirements for a road opening licence. The exact details of this upgrade can be agreed at connection application stage.'

It is noted that all works in public lands will be undertaken by Irish Water.

Water Supply

The proposed development will require a new potable water system to be developed to service the scheme. The proposed new network will tie into the existing public network adjacent to the subject lands. Calculations indicate that the average dry weather flow requirement will be 1.101l/sec with a peak, (5* AWD) requirement of 5.508l/sec.

As required, a *Pre-Connection Enquiry* was lodged with Irish Water indicating their requirements for connection agreement. Following the *Pre-Connection Enquiry* lodgement Irish Water responded with a *Confirmation of Feasibility* letter, indicating that the project could be accommodated in their overall local potable water infrastructure. As per the requirements of an SHD application the proposed watermain design was vetted by Irish Water to ensure adherence to their Code of Practice for Water Infrastructure and a *Statement of Design Acceptance* issued for the scheme. Refer to the Engineering Services Report for a copy of Irish Water correspondence.

6.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

This sub section addresses the implications for the proposed development on the existing environment and looks at the possible affects the proposed development may have during the construction & operational phase. The construction aspects of the proposed development have been reviewed to establish if over the construction period risks have been identified and can be mitigated against. In addition, over the longer operational phase the potential impacts have been established.

6.5.1 Water Supply and Drainage

The principal risks/impacts associated with the **Construction Phase** are:

Surface Water

Hydrological effects could arise from the quality of water discharged to surface water (Rathgory Tributary) during construction. Water will arise primarily from rainfall and other sources such as

groundwater dewatering. Any disposal of water generated during the construction phase will be to the surface water drainage system. Surface construction activities pose a potentially significant risk to all watercourses as these sites will be exposed to rainfall which has the potential to produce run-off. Surface water run-off from surface construction activities has the potential to be mildly contaminated.

The main contaminants arising from surface construction activities include:

- Suspended solids: arising from ground disturbance and excavation;
- Hydrocarbons: accidental spillage from construction plant and storage depots;
- Faecal coliforms: contamination from coliforms can arise if there is inadequate containment and treatment of on-site toilet and washing facilities; and
- Concrete/cementitious products: arising from construction materials.

These pollutants pose a significant temporary risk to surface water quality for the duration of construction if not properly contained and managed. Suspended solids, which can include significant quantities of silt, influence surface water turbidity and are considered to be the most significant risk to surface water quality from construction activities. Suspended Solids can also reduce light penetration, visually impact the receiving water and damage the ecosystem.

These suspended solids are likely to occur in:

- Water removed from surface excavations as a result of rainfall or groundwater seepage;
- Vehicle wheel wash water;
- Runoff from exposed work areas and excavated material storage areas; and
- Cement wash-down areas: The potential for cement to increase the pH of water above a neutral range, that is typically pH 6 to 9, can pose a threat to aquatic species living in a watercourse. Contamination of surface water systems by the other above pollutants may potentially occur due to:
 - Inappropriate handling and storage;
 - Leakage of temporary foul water services;
 - Solid (municipal) wastes being disposed or blown into watercourses or drainage systems;
- Cognize has been made of the requirement to ensure no construction materials will find their way into the existing water courses, notably the tributary of the Rathgory River.

In relation to surface water drainage the construction effect will be moderate, negative and short term.

Foul Water

The Contractors operations will result in the generation of effluent and sanitary waste from facilities provided for the work force on site. The welfare services will generate only domestic wastewater, (i.e. there will be no industrial effluent generated during the construction process). It is envisaged that the effluent generated by the site operatives will be stored on site and discharged directly into the public foul drainage system, and that the appropriate consent for such discharge will be obtained.

The requirement for the Contractor to establish a temporary connection to the existing public foul sewer network will mean that effluent generated on site will be discharged into the public system. The volume of effluent will vary over time as the number of works on site can fluctuate as the works progress. But the volumes of effluent generated will be lower than the final effluent generated on site once the development is complete. As such the foul loading from the site during the construction period is expected to have a slight negative impact on the existing foul drainage network in the short term for the duration of construction work. As the proposed construction works will discharge the effluent generated on site into the public network, this will reduce, temporarily, the capacity of the existing sewer.

All works will follow best industry practice for the planning, supervision and construction of the works. The proposed works will adhere to the construction management plan for the development. The potential impacts were reached by reviewing the current infrastructure in the environs of the proposed development along with the proposed temporary nature of the construction works. Cognisance's was also giving to Irish Water's acceptance of the effluent generated into the public network. Potential impacts have been assessed as short-term & slight.

Water Supply

The contractors will require a separate water supply connection for the works. The impact on the water supply network is likely to be slight negative, and short term for the duration of the construction works.

It is envisaged that the contractor will apply to Irish Water for a temporary connection from the public network on to provide potable water for site construction purposes and for welfare facilities over the duration of the construction programme.

The proposed connection from the site to the public supply will be done with the agreement of Irish Water and on a temporary basis. The proposed temporary site connection will have little overall effect on the local supplies. The potential impacts were reached by reviewing the current infrastructure in the environs of the proposed development along with the proposed temporary nature of the construction works. Cognisance was also given to Irish Water's acceptance of the potable water requirements from the public network.

All works will follow best industry practice for the planning, supervision and construction of the works. The proposed works will adhere to the construction management plan for the development. Potential impacts have been assessed as short-term & slight.

6.5.2 Human Health – Construction Phase

Construction sites have a potential for increased risk of health and safety issues for the operatives and for the wider local community due to the nature of construction activities. The proposed scheme will require re-grading of the sites existing topography, excavations for the installation of the proposed drainage network, associated roads and the re-alignment of the existing stream. Potential risks would include drowning, collision with construction vehicles, falls or exposure to dangerous substances. In addition to risks from operating construction equipment. Members of the public may also be potentially at risk should they venture onto the construction site. Site activities may also impact on the wider community, with noise, dust, excessive light pollution, increased heavy construction traffic etc.

The principal risks/impacts associated with the ***Operational Phase*** are:

Surface Water

The completed stormwater system will be vested to the Local Authority. As such operational and maintenance requirements will be addressed by the Local Authority. Issues which may interfere with the stormwater network pertain to blockages and the lack of appropriate jetting and cleaning of gullies, drains and main sewers are required. Elements during the operational phase which may pose environmental impacts can be increased hardstanding, which may impede local recharge of groundwater. In addition, the proposed development would increase the potential risk of oil, from car parking affecting the ground water and the local water course.

The proposed culverts will also be maintained by the Office of Public Works. This will ensure that the culverts will be kept fit for purpose and operational.

Foul Water

The proposed wastewater network has been designed to cater for the full quantum of the development required for the development. The foul effluent to be generated from the proposed development is 121.31m³, this would equate to a population equivalent of 735 p.e. As part of the planning application process it is a requirement for Irish Water to vet all applications to ensure that the local and regional infrastructure has adequate capacity for the proposed development has been complied with. Irish Water's *Confirmation of Feasibility* has been received, indicating that the development can be accommodated, within the local foul infrastructure and at the local Regional Wastewater Treatment Plant, which has been up-graded to accommodate 10,000p.e. The predicted effects of the proposed foul effluent generated from the site post construction has been established to be long-term & slight. The completed foul system will be offered to be vested to Irish Water. As such the ongoing maintenance will be carried out by Irish Water. Potential issues could be blockages of the drain and sewers due to unsuitable material being placed in same.

Water Supply

The proposed potable network has been designed to cater for the full quantum of the development required for the development. Irish Waters *Confirmation of Feasibility* has been received, indicating that the development can be accommodated. As with the foul network the impact of the proposed works post completion during the operational phase are deemed to be long-term and slight. As Irish Water has reviewed the volumes required, (110.16m³), as part of their assessment procedures they have adjudicated that the requirements can be accommodated without any up-grade works being required. As with foul system, the potable water network will be vested to Irish Water. As such all maintenance works that be required will be undertaken by Irish Water. The predicted effects of the proposed potable water requirements for the site post construction has been established to be long-term & slight. With an overall *neutral effect* on the local network.

6.6 DO NOTHING IMPACT

The 'Do Nothing' impact assesses the environmental impact of not redeveloping the proposed development site in respect of the existing impacts to water, hydrology and existing drainage and water supply systems at the proposed site.

Under the 'Do Nothing' scenario there would be no change in the current site and therefore the hydrology environment and the drainage systems and water supply in the local environs would remain as is. However, as the proposed development will provide separate foul & storm water systems and the storm water system will have a fixed discharge rate for all storm water events. This will allow a reduced flow from the site during extreme storm events, thereby increasing the hydraulic capacity in the public drainage network. Should no development be proposed for the site and the site remains as open undeveloped land there will be no alterations to the current arrangements. If the proposed development does not proceed, there will be no impacts to the existing hydrology aspects of the site. The current rate of surface water run-off would continue to operate in its natural state.

Pluvial flooding events would continue as they have historically in this area.

Groundwater status would also remain unchanged if the existing agricultural land use continued.

6.7 CUMULATIVE IMPACTS

6.7.1 Stormwater

As the proposed development is to incorporate an attenuation system into the overall design, which will limit stormwater discharge rates to an undeveloped rate for all predicted stormwater events, increased by 20% for the potential effects of climate change. By limiting the discharge rate, the hydraulic capacity on the downstream network will be increased. Therefore, during periods of intensive rainfall the cumulative effect on the downstream drainage network will be improved post construction of the development. The proposed works follow on from earlier phases of the subject lands, permitted under ref: 10174, and as amended by 19336 & 19353 of Phase 1 – 3 of the Bridgewater Development. The storm water networks for earlier phases also included attenuation components on to the stormwater network. The overall cumulative effects will be that high intensity storms will be prevented from discharging large volumes of storm water into the local water courses during extreme storm events, (up to and including 1-in-100 year storm events, increased by 20% for the predicted effects of climate change). Therefore, should the proposed phase or the earlier phases experience an extreme storm event, the volumes of storm water generated will be retained and released at a controlled rate.

This has been further explored in the Site Specific Flood Risk Assessment, which accompanies this application.

6.7.2 Foul Drainage

The proposed development will generate increased foul effluent flows which are to be drained into the Irish Water network, permitted under ref: 10174, and as amended by 19336 & 19353 of Phase 1 – 3 of the Bridgewater Development. The proposed increase in foul effluent to be generated from the scheme will reduce the local capacity in the existing foul network and reduce the capacity at the regional Wastewater treatment Plant. The proposed scheme will generate 121.31m³ of additional effluent, this translates into an average additional flow of 1.4l/sec. While the development will reduce the capacity in the wider existing infrastructure network, the zoning for the development lands and the analysis by Irish Water indicate that the reduction in overall local capacity is acceptable. Irish Water have issued a confirmation of feasibility and have reviewed the design and issued a letter of design acceptance (refer to the Engineering Services Report for a copy of same).

Separate Irish Water upgrade works are needed to facilitate development in general in Ardee, including the subject lands, but do not form part of this application. As part of the Confirmation of Feasibility CDS20003735 that forms part of this application, Irish Water note the following:

“The existing wastewater network will require upgrades to cater for the additional proposed load. The upgrade will involve upsizing of between 300 and 1000 meters of existing 225mm sewer along the public road. It is not expected that 3rd party permissions will be required outside the requirements for a road opening licence. The exact details of this upgrade can be agreed at connection application stage.”

The replacement/upsizing of the sewerage infrastructure by Irish Water to facilitate the proposed development would require works to the public road. These will involve the excavation of the existing pipeline and surround along the length of its route, which will be replaced with upgraded pipelines with granular fill surround. The top of the trench will comprise standard backfilled material and road coverings. During excavation works for the pipeline, there is potential for entry of sediment-laden runoff to the Rathgory Tributary if appropriate mitigation measures are not put in place. The construction of the pipelines will be to Irish Water specifications and the construction management (including the implementation of appropriate mitigation measures) will ensure that there are no significant impacts

arising. As noted, a *Pre-Connection Enquiry* was lodged with Irish Water indicating their requirements for connection agreement. Following the *Pre-Connection Enquiry* lodgement Irish Water responded with a *Confirmation of Feasibility* letter, indicating that the project could be accommodated in their overall local wastewater infrastructure. As per the requirements of an SHD application the proposed foul network design was vetted by Irish Water to ensure adherence to their Code of Practice for Wastewater Infrastructure and a *Statement of Design Acceptance* issued for the scheme. Refer to the Engineering Services Report for a copy of Irish Water correspondence.

6.7.3 Potable Water

The proposed development will generate an increased requirement for potable water to be taken from the Irish Water network. The capacity in the existing infrastructure network, the zoning for the development lands, and the analysis by Irish Water indicate that the reduction in overall local capacity is acceptable and no up-grades are required. Irish Water have issued confirmation of feasibility and have reviewed the design and issued a letter of design acceptance (refer to the Engineering Services Report for a copy of same).

6.7.4 Phases 1 – 3

The proposed scheme forms part of an overall masterplan. Earlier phases have been granted planning permission, under permission 10174, as amended and are currently under construction on site. A review of the potential cumulative effects of this scheme was carried out. As both the foul effluent generation and potable water demand are subject to an independent assessment from Irish Water. The required capacity for both in the local network has been assessed and deemed to be available. Regarding the disposal of surface water, the proposed provision for on-site attenuation, suitably sized in accordance with the requirements from the local authority means that surface water discharge post development will replicate the existing non-developed discharge rate. This will reduce the likelihood of detrimental off-site effects from extreme storms in the future. Therefore, the cumulative effects from phases 1–3 are not deemed to be significant.

6.8 AVOIDANCE, REMEDIAL AND MITIGATION MEASURES

The main potential impacts are associated with the Construction Phase of the proposed development. Mitigation measures relating to impacts outlined in the previous section are outlined below:

Construction Phase

- Prior to construction the Contractor will be required to develop an Environmental Management Plan which will incorporate mitigation measures set out in this EIAR, such as containment procedures, audit and review schedules and an Emergency Response Plan in the event of spills, flooding or other incidents that may contribute to pollution to water during construction.
- All batching and mixing activities will be located in areas away from watercourses and drains.
- Protection measures will be put in place to ensure that all materials used during the construction phase are appropriately handled, stored and disposed of in accordance with recognised standards and manufacturer's guidance.
- Surface water drainage around the batching plant will be controlled and washout from mixing plant will be carried out in a designated, contained impermeable area.
- Spills of concrete, cement, grout or similar materials will not be hosed into drains.

- Rainwater that accumulates on site will be discharged to the LCC sewer system.
- The Contractor will comply with the following guidance documents:
CIRIA – Guideline Document C532 Control of Water Pollution from Construction Sites (CIRIA, 2001).
- Dewatering and surface water discharges on the site, during construction and prior to completion will be controlled. All necessary facilities will be incorporated such as settlement ponds/tanks, oil/grit interceptors with shut down valves, bunded oil storage tanks adjacent to a petrol interceptor for storage of any recovered oil. A monitoring programme including sampling for water quality before discharge to the Council sewer during construction will be carried out to ensure that only clean surface water is discharged to the receiving systems.
- The Contractor will make all necessary arrangements for a temporary water supply in agreement with Irish Water and/or Louth County Council, in addition temporary pumping of ground water to facilitate excavation, if required, will be licenced by Louth County Council and the water levels monitored as outlined in the basement impact assessment.
- The recommendations set out in the *Biodiversity Chapter*, (Chapter 4 of this EIAR), have been considered with regard to potential construction impacts which would occur during the on site development of the scheme. Notably potential impacts on sensitive receptors within the identified zone of influence and mitigation measures but forward to address same.

Operational Phase

- Incidental surface run-off from underground basement car parks, compactor units and waste / service yard areas will be discharged into the foul drainage system. Grit / petrol / oil separators will be provided in all of the above areas to improve the quality of water discharging.
- The provision of flow control with stormwater attenuation will ensure the rate of discharge of surface water is limited to greenfield run-off rates of 2 litres/second/hectare with a total allowable surface water discharge of 2 litres/second in line with the recommendations of the Greater Dublin Regional Code of Practice for Drainage Works and the Greater Dublin Strategic Drainage Study.
- SuDS proposals will improve the quality and reduce the quantity of surface water discharging into the receiving system.
- Removal of the surface water from the existing combined sewers will reduce the hydraulic loading on the existing sewerage network and Regional Wastewater Treatment Plant.

Moderate negative impacts during the construction phase will be short term only in duration. Implementation of the above measures will mitigate any significant long-term adverse impact.

6.9 HUMAN HEALTH - MITIGATION MEASURES

As noted in *Section 6.5.2* construction by its very nature contains the potential to affect the human health of the workers on site and the local population. To mitigation, as far as is possible, the potential risks a number of protocols will be implemented for the duration of the scheme.

- All proposed site operatives to be fully trained in their respective duties, to have completed the national 'Safe-pass' course and the bespoke site safety course for the site.

- The main Contractor for the development will ensure that only suitable qualified operatives shall be given the role and responsibility to operate equipment and machinery for which they are certified.
- The site will have Health & Safety protocols established, monitored and maintained by suitably qualified personnel on site to ensure the construction site is operated to the required standard.
- The storing and movement of materials will be in accordance with the suppliers and manufactures requirements.
- Excavations and waters courses will be suitably identified and cordoned off during the construction phase of the development.
- The Contractor will ensure responsibility for the maintenance and safe entry/egress of construction vehicles, including dust suppression & road sweeping.
- The site will have suitable 24/7 security to prevent acts of trespass onto the site during the construction period.

6.10 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

No negative residual impacts to water quality are anticipated during the construction and operational phases with the implementation of the site clearance, construction and operational mitigation measures outlined in Section 6.8 above, as outlined below.

Surface Water

The provision of petrol/ oil interceptors and grease trays where required will ensure improved quality of surface water run-off from the development to the existing system. The provision of flow control with storm attenuation will ensure a reduced quantity of surface water discharging to the existing surface water sewerage system, therefore reducing the impact on the receiving system. As such the proposed works will not alter the local water courses 'Q status' (currently 'good') or the *Water Framework* quality designation, (currently 'moderate').

Foul Water

No significant impact is expected to occur to the sewerage systems as a result of the proposed development. Any increase in discharge will be compensated by a reduction in the expected surface water runoff into the combined sewers from the redevelopment. The proposed layout and loading were vetted by Irish Water who deemed the local network, subject to up-grades could accept the increased volumes. Any required up-grades off site will be undertaken by Irish Water and their designated contractors. As noted in Irish Waters *Pre-Connection Enquiry* response contributions towards up-grades deemed required by Irish Water will form part of the connection agreement should planning permission be secured. The predicted effects will be slight and long-term.

Water Supply

The development will result in additional demands on the public water network however the installation of low flow devices will minimise the impact of the development on the existing water supply network. The proposed layout and loading were vetted by Irish Water who deemed the local network could provide the increased volumes, without up-grades. As with all new development of the nature proposed,

water saving devices and water meters to Irish Water requirements are proposed to be installed in the development. The predicted effects will be slight and long-term.

6.11 HUMAN – PREDICTED IMPACTS

All construction activity poses some risk to both the operatives on site and to the greater public. While mitigation factors can have a substantial impact on the overall level of safety of operatives on site and can greatly reduce the potential risks to members of the public there will always be an element of risk associated with on site construction activities, that cannot be removed during the construction process.

Post construction and the lifetime of the development the risk is greatly reduced as once the various elements have been constructed there will be no requirement for construction activity on site.

6.12 MONITORING

Ongoing monitoring of the water quality during construction is proposed. The mitigation measures in this EIAR which will be incorporated into the Construction Management Plan & the Construction Environmental Management Plan will be adhered to. In addition, good site practice for dust suppression and general site operation will be followed. It is not foreseen that any monitoring will be required on completion of the proposed development, save for where operational maintenance to the drainage or water supply system is periodically required. During the operational phase the foul & potable water systems will be vested to Irish Water. The storm water system and associated SuDs features will be maintained by the Local Authority.

6.13 REINSTATEMENT

Any temporary construction compounds will be removed from the site following the end of the site clearance and construction phases. Reinstatement at completion of the works will involve removal of all deleterious materials that may have been deposited during construction works and restoring any areas within the public realm/pedestrian corridor with an appropriate and acceptable hard-wearing layer with all associated drainage for the development in place.

6.14 INTERACTIONS

The impacts described previously in this Chapter also relate to and interact with other chapters within the EIAR, specifically: Population and Human Health, Land and Soils, Biodiversity and Material Assets. In assessing the impact on Water, we have also considered and had regard to a number of the separate standalone reports included with this planning application and best practice guidance for developments of a similar nature.

6.15 DIFFICULTIES ENCOUNTERED IN COMPILING

There were no difficulties encountered in the compilation of this chapter.

- Foul & potable water queries and information was made available from Irish Water.
- Stormwater records and guidance was available from Louth County Council.

7.0 AIR & CLIMATE

7.1 INTRODUCTION

This chapter assesses the likely air quality and climate impacts associated with the proposed residential development at Bridgegate, Rathgory & Mulladrillen, Drogheda Road, Ardee, Co. Louth. The proposed development will involve the construction of residential units, a crèche, community building, public open space and all associated infrastructure. The total gross site area comprises a c.13.03 hectare greenfield site.

This chapter was completed by Ciara Nolan, an environmental consultant in the air quality section of AWN Consulting Ltd. She holds an MSc. (First Class) in Environmental Science from University College Dublin and has also completed a BSc. in Energy Systems Engineering. She is an Associate Member of both the Institute of Air Quality Management and the Institution of Environmental Science. She has been active in the field of air quality for 4 years, with a primary focus on consultancy.

7.2 STUDY METHODOLOGY

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

- 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 – Draft (EPA, 2017)
- Advice Note on Preparing Environmental Impact Statements – Draft (EPA, 2015)
- Advice Notes On Current Practice (In The Preparation Of Environmental Impact Statements) (EPA, 2003)
- Guidelines On Information To Be Contained in Environmental Impact Statements (EPA, 2002)
- Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Commission, 2013)
- Guidance on the Assessment of Dust from Demolition and Construction Version 1.1 (Institute of Air Quality Management (IAQM), 2014)
- UK Design Manual for Roads and Bridges (DMRB), Volume 11, Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 1 LA 105 Air quality (UK Highways Agency, 2019a)
- UK Design Manual for Roads and Bridges (DMRB) Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 14 LA 114 Climate (UK Highways Agency, 2019b)

7.2.1 Criteria for Rating of Impacts

Ambient Air Quality Standards

In order to reduce the risk to health from poor air quality, national and European statutory bodies 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 (see Table 7.1 and Appendix 7.1).

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland include the Air Quality Standards Regulations 2011, which incorporate EU Directive 2008/50/EC, which has set limit values for a number of pollutants. The limit values for NO₂, PM₁₀ and PM_{2.5} are relevant to this assessment as these are traffic related pollutants (see Table 7.1). Although the EU Air Quality Limit Values are the basis of legislation, other thresholds outlined by the EU Directives are used which are triggers for particular actions (see Appendix 7.1).

Table 7.1: Air Quality Standards Regulations

Pollutant	Regulation ^{Note 1}	Limit Type	Value
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
		Critical level for protection of vegetation	30 µg/m ³ NO + NO ₂
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
		Annual limit for protection of human health	40 µg/m ³
Particulate Matter (as PM _{2.5})	2008/50/EC	Annual limit for protection of human health	25 µg/m ³

Note 1 EU 2008/50/EC – Clean Air For Europe (CAFÉ) Directive replaces the previous Air Framework Directive (1996/30/EC) and daughter directives 1999/30/EC and 2000/69/EC

Dust Deposition Guidelines

The concern from a health perspective is focussed on particles of dust which are less than 10 microns (PM₁₀) and less than 2.5 microns (PM_{2.5}) and the EU ambient air quality standards outlined in Table 7.1 have set ambient air quality limit values for PM₁₀ and PM_{2.5}.

With regards 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. Furthermore, no specific criteria have been stipulated for nuisance dust in respect of this development.

With regard to 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. Recommendations from the Department of the Environment, Heritage & Local Government (DEHLG, 2004) apply the Bergerhoff limit of 350 mg/(m²*day) to the site boundary of quarries. This limit value can also be implemented with regard to dust impacts from construction of the proposed development.

Climate Agreements

Ireland is party to both the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. The Paris Agreement, which entered into force in 2016, is an important milestone in terms of international climate change agreements and includes an aim of limiting global temperature increases to no more than 2°C above pre-industrial levels with efforts to limit this rise to 1.5°C. The aim is to limit global GHG emissions to 40 gigatonnes as soon as possible whilst acknowledging that peaking of GHG emissions will take longer for developing countries. Contributions to GHG emissions will be based on Intended Nationally Determined Contributions (INDCs) which will form the foundation for climate action post 2020. Significant progress was also made in the Paris Agreement and COP 26 (2021) on elevating adaption onto the same level as action to cut and curb emissions.

In order to meet the commitments under the Paris Agreement, the EU enacted *Regulation (EU) 2018/842 on binding annual greenhouse gas 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* (the Regulation). The Regulation aims to deliver, collectively by the EU in the most cost-effective manner possible, reductions in GHG emissions from the Emission Trading Scheme (ETS) and non-ETS sectors amounting to 43% and 30%, respectively, by 2030 compared to 2005. Ireland's obligation under the Regulation is a 30% reduction in non-ETS greenhouse gas emissions by 2030 relative to its 2005 levels.

In 2015, the Climate Action and Low Carbon Development Act 2015 (No. 46 of 2015) (Government of Ireland, 2015) was enacted (the 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 Act as the ‘national transition objective’. The Act makes provision for, *inter alia*, a national adaptation framework. In addition, the 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 *Climate Action Plan* (CAP) (Government of Ireland, 2019), published in June 2019, outlines the current status across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and outlines the various broadscale measures required for each sector to achieve ambitious decarbonisation targets. The CAP also details 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 CAP has set a built environment sector reduction target of 40 - 45% relative to 2030 pre-NDP (National Development Plan) projections.

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 approved the publication of the General Scheme for the Climate Action (Amendment) Bill 2019 in December 2019 (Government of Ireland, 2019). The General Scheme was prepared for the purposes of giving statutory effect to the core objectives stated within the CAP.

In October 2020, the Climate Action and Low Carbon Development (Amendment) Bill 2020 (Government of Ireland, 2020) was published in draft format (draft 2020 Climate Act) which amends and enhances the 2015 Climate Act. The purpose of the Climate Act (2021) is to provide for the approval of plans ‘for the purpose of pursuing the transition to a climate resilient and climate neutral economy by the end of the year 2050’. 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 removes any reference to a national mitigation plan and instead refers to both the Climate Action Plan, as published in 2019, and a series of National Long Term Climate Action Strategies. In addition, the Environment Minister shall request each local authority to make a ‘local authority climate action plan’ lasting five years and to specify the mitigation measures and the adaptation measures to be adopted by the local authority.

Louth County Development Plan 2021 - 2027

Air Quality is discussed in Section 11.1.5 of Chapter 11 of the Louth County Development Plan 2021 – 2027 (Louth County Council, 2021). LCC recognise that poor air quality has the potential to lead to significant health and environmental problems. Policy Objective ENV12 of Chapter 11 has been established “*To promote the preservation of best ambient air quality compatible with sustainable development in accordance with the EU Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive (2008/50/EC) and ensure that all air emissions associated with new developments are within Environmental Quality Standards as out in the Air Quality Standards Regulations 2011 (SI No. 180 of 2011) (or any updated/superseding documents)*”.

The impacts to air quality associated with the proposed development have been assessed against the EU Ambient Air Quality Standards (Table 7.1) in line with objective ENV12 of the draft development plan. It has been ensured that any impacts to air quality are in compliance with these standards.

Chapter 12 of the Louth County Development Plan 2021 – 2027 discusses Climate Action. There are several policy objectives in relation to the Built Environment set out within Table 12.2 of Chapter 12 of the Plan. Two policies relevant to the proposed development include:

IU84 “To support the implementation of National and County initiatives for limiting emissions of greenhouse gases by incorporating energy efficiency measures into the design of new buildings and retrofitting of existing buildings”.

IU85 “To ensure that all new buildings in the County achieve the Nearly Zero-Energy Buildings (NZEB) standard in line with the Energy Performance of Buildings Directive (EPBD) and having regard to the Guidelines for Sustainable Design and Energy Efficiency in Buildings”.

Attention has been paid to the Louth County Development Plan 2021 – 2027 in relation to potential impacts to climate associated with the proposed development.

7.2.2 Assessment of Construction Phase

Air Quality

The current assessment focuses on identifying the existing baseline levels of PM₁₀ and PM_{2.5} in the region of the proposed development by an assessment of EPA monitoring data. Thereafter, the impact of the construction phase of the development on air quality was determined by a qualitative assessment of the nature and scale of dust generating construction activities associated with the proposed development.

Construction phase traffic also has the potential to impact air quality and climate. The UK DMRB guidance (UK Highways Agency, 2019a), 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. Transport Infrastructure Ireland (TII) reference the use of the UK Highways Agency and DEFRA guidance and methodology in their document *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes* (2011). This approach is considered best practice in the absence of Irish guidance .

- Annual average daily traffic (AADT) changes by 1,000 or more;
- Heavy duty vehicle (HDV) AADT changes by 200 or more;
- A change in speed band;
- A change in carriageway alignment by 5m or greater.

The construction stage traffic has been reviewed and does not meet the above scoping criteria and therefore, has been scoped out from any further assessment as there is no potential for significant impacts to air quality.

Climate

The impact of the construction phase of the development on climate was determined by a qualitative assessment of the nature and scale of greenhouse gas generating construction activities associated with the proposed development.

7.2.3 Assessment of Operational Phase

Air Quality

The air quality assessment has been carried out following procedures described in the publications by the EPA (2015; 2017) and using the methodology outlined in the guidance documents published by the UK Highways Agency (2019a) and UK Department of Environment Food and Rural Affairs (DEFRA) (2016; 2018). Transport Infrastructure Ireland (TII) reference the use of the UK Highways Agency and DEFRA guidance and methodology in their document *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes* (2011). This approach is considered best practice in the absence of Irish guidance and can be applied to any development that causes a change in traffic.

In 2019 the UK Highways Agency DMRB air quality guidance was revised with *LA 105 Air Quality* replacing a number of key pieces of guidance (HA 207/07, IAN 170/12, IAN 174/13, IAN 175/13, part of IAN 185/15). This revised document outlines a number of changes for air quality assessments in relation to road schemes, but can be applied to any development that causes a change in traffic. Previously the DMRB air quality spreadsheet was used for the majority of assessments in Ireland with detailed modelling only required if this screening tool indicated compliance issues with the EU air quality standards. Guidance from Transport Infrastructure Ireland (TII, 2011) recommends the use of the UK Highways Agency DMRB spreadsheet tool for assessing the air quality impacts from road schemes. However, the DMRB spreadsheet tool was last revised in 2007 and accounts for modelled years up to 2025. Vehicle emission standards up to Euro V are included but since 2017, Euro 6d standards are applicable for the new fleet. In addition, the model does not account for electric or hybrid vehicle use. Therefore, this a somewhat outdated assessment tool. The LA 105 guidance document states that the DMRB spreadsheet tool may still be used for simple air quality assessments where there is unlikely to be a breach of the air quality standards. Due to its use of a “dirtier” fleet, vehicle emissions would be considered to be higher than more modern models and therefore any results will be conservative in nature and will provide a worst-case assessment.

The 2019 UK Highways Agency DMRB air quality revised guidance *LA 105 Air Quality* states that modelling should be conducted for NO₂ for the base, opening and design years for both the do minimum (do nothing) and do something scenarios. Modelling of PM₁₀ is only required for the base year to demonstrate that the air quality limit values in relation to PM₁₀ are not breached. Where the air quality modelling indicates exceedances of the PM₁₀ air quality limits in the base year then PM₁₀ should be included in the air quality model in the do minimum and do something scenarios. Modelling of PM_{2.5} is not required as there are currently no issues with compliance with regard to this pollutant. The modelling of PM₁₀ can be used to show that the project does not impact on the PM_{2.5} limit value as if compliance with the PM₁₀ limit is achieved then compliance with the PM_{2.5} limit will also be achieved. Historically modelling of carbon monoxide (CO) and benzene (Bz) was required however, this is no longer needed as concentrations of these pollutants have been monitored to be significantly below their air quality limit values in recent years, even in urban centres (EPA, 2020a). The key pollutant reviewed in this assessment is NO₂. Concentrations of PM₁₀ have been modelled for the base year to indicate that there are no potential compliance issues. Modelling of operational NO₂ concentrations has been conducted for the do nothing and do something scenarios for the opening year (2024) and design year (2039).

The TII guidance (2011) states that the assessment must progress to detailed modelling if:

- Concentrations exceed 90% of the air quality limit values when assessed by the screening method; or
- Sensitive receptors exist within 50m of a complex road layout (e.g. grade separated junctions, hills etc).

The UK DMRB scoping criteria outlined in Section 7.2.2 has been used in the current assessment to determine the road links required for inclusion in the modelling assessment. Sensitive receptors within 200m of impacted road links are included within the modelling assessment. Pollutant concentrations are calculated at these sensitive receptor locations to determine the impact of the proposed development in terms of air quality. The guidance states a proportionate number of representative receptors which are located in areas which will experience the highest concentrations or greatest improvements as a result of the proposed development are to be included in the modelling (UK Highways Agency, 2019a). The TII guidance (2011) defines sensitive receptor locations as: residential housing, schools, hospitals, places of worship, sports centres and shopping areas, i.e. locations where members of the public are likely to be regularly present. A total of four high sensitivity residential receptors (R1 – R4) were included in the modelling assessment and are detailed in Figure 7.1.

The following model inputs are required to complete the assessment using the DMRB spreadsheet tool: road layouts, receptor locations, annual average daily traffic movements (AADT), percentage heavy goods vehicles (%HGV), annual average traffic speeds and background concentrations. Using this input data the model predicts the road traffic contribution to ambient ground level concentrations at the worst-case sensitive receptors using generic meteorological data. The DMRB model uses conservative emission factors, the formulae for which are outlined in the DMRB Volume 11 Section 3 Part 1 – HA 207/07 Annexes B3 and B4. These worst-case road

contributions are then added to the existing background concentrations to give the worst-case predicted ambient concentrations. The worst-case ambient concentrations are then compared with the relevant ambient air quality standards to assess the compliance of the proposed development with these ambient air quality standards.

The TII document *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes* (2011) 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 both the absolute and relative impact of the proposed development. The TII significance criteria have been adopted for the proposed development and are detailed in Appendix 7.2 Table A7.2.1 and Table A7.2.2. The significance criteria are based on NO₂ and PM₁₀ as these pollutants are most likely to exceed the annual mean limit values (40 µg/m³).

Conversion of NO_x to NO₂

NO_x (NO + NO₂) is emitted by vehicles exhausts. The majority of emissions are in the form of NO, however, with greater diesel vehicles and some regenerative particle traps on HGV's the proportion of NO_x emitted as NO₂, rather than NO is increasing. With the correct conditions (presence of sunlight and O₃) emissions in the form of NO, have the potential to be converted to NO₂.

Transport Infrastructure Ireland states the recommended method for the conversion of NO_x to NO₂ in "*Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes*" (2011). The TII guidelines recommend the use of DEFRA's NO_x to NO₂ calculator (2020) which was originally published in 2009 and is currently on version 8.1. This calculator (which can be downloaded in the form of an excel spreadsheet) accounts for the predicted availability of O₃ and proportion of NO_x emitted as NO for each local authority across the UK. O₃ is a regional pollutant and therefore concentrations do not vary in the same way as concentrations of NO₂ or PM₁₀.

The calculator includes Local Authorities in Northern Ireland and the TII guidance recommends the use of 'Armagh, Banbridge and Craigavon' as the choice for local authority when using the calculator. The choice of Craigavon provides the most suitable relationship between NO₂ and NO_x for Ireland. The "All Non-Urban UK Traffic" traffic mix option was used.

Update to NO₂ Projections using DMRB

In 2011 the UK DEFRA published research (Highways England, 2013) on the long term trends in NO₂ and NO_x for roadside monitoring sites in the UK. This study marked a decrease in NO₂ concentrations between 1996 and 2002, after which the concentrations stabilised with little reduction between 2004 and 2010. The result of this is that there now exists a gap between projected NO₂ concentrations which UK DEFRA previously published and monitored concentrations. The impact of this 'gap' is that the DMRB screening model can under-predict NO₂ concentrations for predicted future years. Subsequently, the UK Highways Agency published an Interim advice note (IAN 170/12) in order to correct the DMRB results for future years. This methodology has been used in the current assessment to predict future concentrations of NO₂ as a result of the proposed development.

Traffic Data Used in Modelling Assessment

Traffic flow information was obtained from CS Consulting on 22/03/2021 for the purposes of this assessment. Data for the Do Nothing and Do Something scenarios for the base year 2021, opening year 2024 and design year 2039 were provided. The traffic data is detailed in Table 7.2 with the %HGV shown in parenthesis below the AADT. The traffic data used in the assessment is worst-case to ensure a conservative approach in regard to the modelling. Only road links that met the DMRB scoping criteria outlined in Section 7.2.2 and that were within 200m of receptors were included in the modelling assessment. Background concentrations have been included as per Section 7.3.2 of this chapter based on available EPA background monitoring data (EPA, 2020a). This traffic data has also been used in the operational stage climate impact assessment.

Road Name	Speed (kph)	Base Year 2021	Opening Year 2024		Design Year 2039	
			Do Nothing	Do Something	Do Nothing	Do Something
N2 Bridge Street (to north of R170)	50	13,441 (7%)	14,352 (7.4%)	16,848 (7.1%)	18,117 (7.8%)	19,564 (7.3%)
R170 William Street / Moorhall (to east of N2)	50	7,309 (3.7%)	7,789 (3.9%)	9,012 (3.8%)	9,663 (4.2%)	10,177 (4%)
John Street (to west of N2)	50	6,177 (3%)	6,889 (3.2%)	7,602 (3.2%)	8,147 (3.5%)	8,309 (3.5%)
N2 Drogheda Road (to south of John Street)	60	9,751 (8.4%)	10,294 (8.8%)	13,090 (7.8%)	14,033 (8.7%)	16,156 (7.6%)
N2 Drogheda Road (to south of Bridgegate access)	60	9,561 (8.6%)	10,095 (9.1%)	11,678 (8.8%)	12,604 (9.7%)	13,500 (9.1%)

Table 7.2: Traffic Data Used in Air Quality & Climate Modelling Assessments



Figure 7.1: Approximate Location of Receptors used in Local Air Quality Modelling Assessment

Air Quality Impact on Ecological Sites

For routes that pass within 2 km of a designated area of conservation (either Irish or European designation) the TII requires consultation with an ecologist (TII, 2011). However, in practice the potential for impact to an ecological site is highest within 200 m of the proposed scheme and when significant changes in AADT (>5%) occur. Only sites that are sensitive to nitrogen deposition should be included in the assessment. In addition, the UK Highways Agency (2019a) states that a detailed assessment does not need to be conducted for areas that have been designated for geological features or watercourses.

Transport Infrastructure Ireland's Guidelines for Assessment of Ecological Impacts of National Road Schemes (2009) and Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities (DEHLG, 2010) provide details regarding the legal protection of designated conservation areas.

If both of the following assessment criteria are met, an assessment of the potential for impact due to nitrogen deposition should be conducted:

- A designated area of conservation is located within 200 m of the proposed development; and
- A significant change in AADT flows (>5%) will occur.

There are no designated sites within 200m of any of the road links impacted by the proposed development. Therefore, a detailed NO_x assessment is not required.

Climate

Ireland has annual GHG targets which are set at an EU level and need to be complied with in order to reduce the impact of climate change. Impacts to climate as a result of GHG emissions are assessed against the targets set out by the EU under *Regulation (EU) 2018/842 on binding annual greenhouse gas 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*. Which has set a target of a 30% reduction in non-ETS sector emissions by 2030 relative to 2005 levels.

As per the EU guidance document *Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment* (European Commission, 2013) the climate baseline is first established by reference to EPA data on annual GHG emissions (see Section 7.3.3). Thereafter the impact of the proposed development on climate is determined. Emissions from road traffic associated with the proposed development have the potential to emit carbon dioxide (CO₂) which will impact climate.

The UK Highways Agency has published an updated DMRB guidance document in relation to climate impact assessments *LA 114 Climate* (UK Highways Agency, 2019b). The following scoping criteria are used to determine whether a detailed climate assessment is required for a proposed project during the operational stage. During the operational phase, if any of the road links impacted by the proposed development meet the below criteria then further assessment is required.

- A change of more than 10% in AADT;
- A change of more than 10% to the number of heavy duty vehicles; and
- A change in daily average speed of more than 20 km/hr.

There are a small number of road links that will experience an increase of 10% or more in the AADT. These road links have been included in the detailed climate assessment (see Table 7.2). The impact of the proposed development at a national / international level has been determined using the procedures given by Transport Infrastructure Ireland (2011) and the methodology provided in Annex D in the UK Design Manual for Roads and Bridges (UK Highways Agency, 2007). The assessment focused on determining the resulting change in emissions

of carbon dioxide (CO₂). The Annex provides a method for the prediction of the regional impact of emissions of these pollutants from road schemes and can be applied to any project that causes a change in traffic. The inputs to the air dispersion model consist of information on road link lengths, AADT movements and annual average traffic speeds (see Table 7.2).

The EU guidance (2013) also states indirect GHG emissions as a result of a development must be considered, this includes emissions associated with energy usage. The Energy Report prepared in relation to this assessment has been reviewed and used to inform the operational phase climate assessment. This report outlines a number of measures in relation to energy usage from the proposed development primarily in relation to heat and electricity. A number of measures have been incorporated into the overall design of the development to reduce the impact to climate where possible.

7.3 THE EXISTING RECEIVING ENVIRONMENT (BASELINE SITUATION)

7.3.1 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 PM₁₀, 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} - PM₁₀) will actually increase at higher wind speeds. Thus, measured levels of PM₁₀ will be a non-linear function of wind speed.

The nearest representative weather station collating detailed weather records is Dublin Airport, which is located approximately 50 km south-east of the site. Dublin Airport met data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (see Figure 7.2). For data collated during five representative years (2016 – 2020), the predominant wind direction is westerly to south-westerly with a mean wind speed of 5.3 m/s over the period 2005 – 2019 (Met Eireann, 2021).

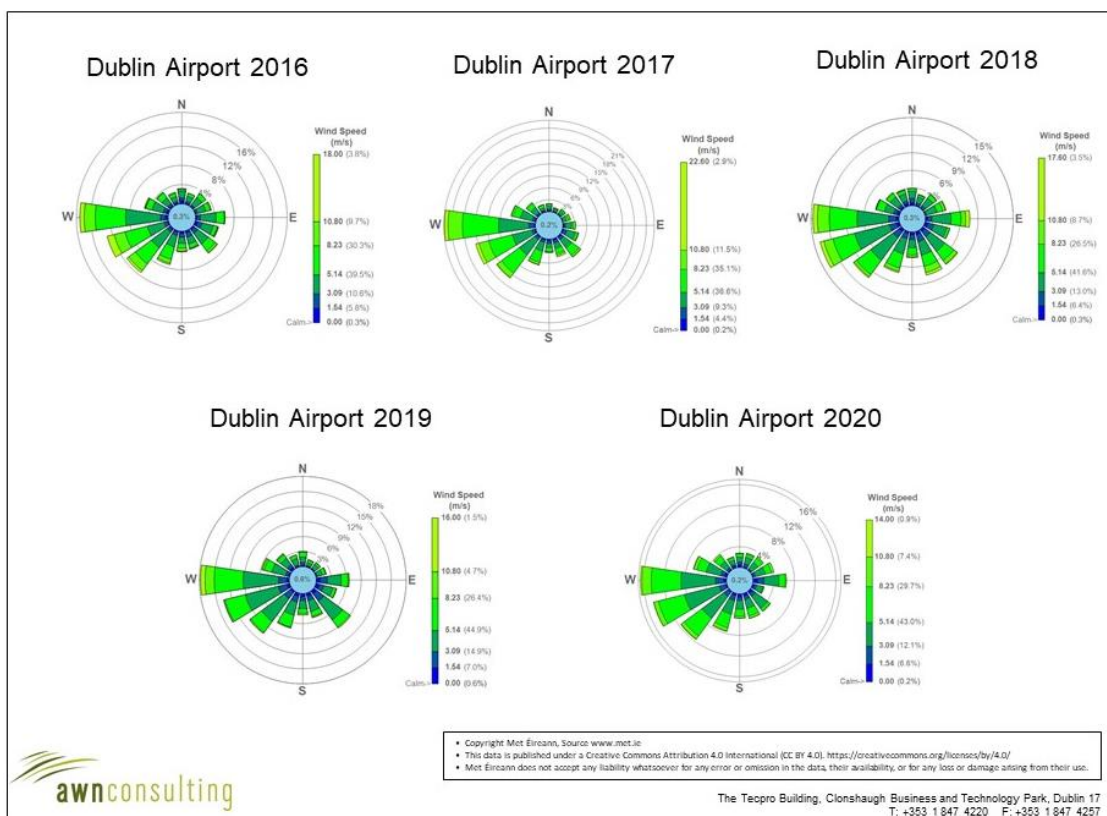


Figure 7.2: Dublin Airport Windrose 2016 – 2020

7.3.2 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 2019*” (EPA, 2020a). 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, 2021).

As part of the implementation of the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011), as amended, four air quality zones have been defined in Ireland for air quality management and assessment purposes (EPA, 2021). 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 D (EPA, 2021). 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.).

Long-term NO₂ monitoring was carried out at the Zone D locations of Castlebar, Kilkitt and Emo for the period 2015 - 2019 (EPA, 2020a). Long term average concentrations are significantly below the annual average limit of 40 µg/m³, average results range from 2 – 9 µg/m³. The NO₂ annual average for this five year period suggests an upper average limit of no more than 8 µg/m³ (Table 7.3) as a background concentration. Based on the above information, a conservative estimate of the current background NO₂ concentration for the region of the proposed development is 9 µg/m³.

Station	Averaging Period	Year				
		2015	2016	2017	2018	2019
Castlebar	Annual Mean NO ₂ (µg/m ³)	8	9	7	8	8
	Max 1-hr NO ₂ (µg/m ³)	96	91	112	92	86
Killkitt	Annual Mean NO ₂ (µg/m ³)	2	3	2	3	5
	Max 1-hr NO ₂ (µg/m ³)	97	80	25	37	59
Emo	Annual Mean NO ₂ (µg/m ³)	3	4	3	3	4
	Max 1-hr NO ₂ (µg/m ³)	34	194	33	31	56

Note 1 Annual average limit value of 40 µg/m³ and hourly limit value of 200 µg/m³ (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

Table 7.3: Trends In Zone D Air Quality – NO₂

Continuous PM₁₀ monitoring was carried out at three Zone D locations from 2015 - 2019, Castlebar, Killkitt and Claremorris. These showed an upper average limit of no more than 13 µg/m³ (Table 7.4). Levels range from 7 – 1163 µg/m³ over the five year period with at most 2 exceedances of the 24-hour limit value of 50 µg/m³ in any year (35 exceedances are permitted per year) (EPA, 2020a). Based on the EPA data, a conservative estimate of the current background PM₁₀ concentration in the region of the proposed development is 14 µg/m³.

Station	Averaging Period	Year				
		2015	2016	2017	2018	2019
Castlebar	Annual Mean PM ₁₀ (µg/m ³)	13	12	11	11	16
	24-hr Mean > 50 µg/m ³ (days)	2	1	1	0	1
Killkitt	Annual Mean PM ₁₀ (µg/m ³)	9	8	8	9	7
	24-hr Mean > 50 µg/m ³ (days)	1	0	0	0	1
Claremorris	Annual Mean PM ₁₀ (µg/m ³)	10	10	11	12	11
	24-hr Mean > 50 µg/m ³ (days)	0	0	1	0	0

Note 1 Annual average limit value of 40 µg/m³ and 24-hour limit value of 50 µg/m³ (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

Table 7.4: Trends In Zone D Air Quality – PM₁₀

Average PM_{2.5} levels in Claremorris over the period 2015 - 2019 ranged from 4 – 6 µg/m³, with a PM_{2.5}/PM₁₀ ratio ranging from 0.4 – 0.6 (EPA, 2020a). Based on this information, a conservative ratio of 0.7 was used to generate an existing PM_{2.5} concentration in the region of the development of 9.8 µg/m³.

Background concentrations for the Opening Year 2024 and Design Year of 2039 have been calculated for the local air quality assessment. These have used current estimated background concentrations and the year on year reduction factors provided by Transport Infrastructure Ireland in the *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes* (2011) and the UK Department for Environment, Food and Rural Affairs LAQM.TG(16) (2018).

7.3.3 Climate Baseline

Anthropogenic emissions of greenhouse gases in Ireland included in the EU 2020 strategy are outlined in the most recent review by the EPA which details provisional emissions up to 2019 (EPA, 2020b). The data published in 2020 states that Ireland will exceed its 2019 annual limit set under the EU's Effort Sharing Decision (ESD), 406/2009/EC1 by an estimated 6.98 Mt. For 2019, total national greenhouse gas emissions are estimated to be 59.90 million tonnes carbon dioxide equivalent (Mt CO₂eq) with 45.71 MtCO₂eq of emissions associated with the ESD sectors for which compliance with the EU targets must be met. Agriculture is the largest contributor in 2019 at 35.3% of the total, with the transport sector accounting for 20.3% of emissions of CO₂.

GHG emissions for 2019 are estimated to be 4.5% lower than those recorded in 2018. Emission reductions have been recorded in 6 of the last 10 years. However, compliance with the annual EU targets has not been met for four years in a row. Emissions from 2016 – 2019 exceeded the annual EU targets by 0.29 MtCO₂eq, 2.94 MtCO₂eq, 5.57 MtCO₂eq and 6.98 MtCO₂eq respectively. Agriculture is consistently the largest contributor to emissions with emissions from the transport and energy sectors being the second and third largest contributors respectively in recent years.

The EPA 2019 GHG Emissions Projections Report for 2018 – 2040 (EPA 2019) notes that there is a long-term projected decrease in greenhouse gas emissions as a result of inclusion of new climate mitigation policies and measures that formed part of the National Development Plan (NDP) which was published in 2018. Implementation of these are classed as a “*With Additional Measures scenario*” for future scenarios. A change from generating electricity using coal and peat to wind power and diesel vehicle engines to electric vehicle engines are envisaged under this scenario. While emissions are projected to decrease in these areas, emissions from agriculture are projected to grow steadily due to an increase in animal numbers. However, over the period 2013 – 2020 Ireland is projected to cumulatively exceed its compliance obligations with the EU's Effort Sharing Decision (Decision No. 406/2009/EC) 2020 targets by approximately 10 Mt CO₂eq under the “*With Existing Measures*” scenario and 9 Mt CO₂eq under the “*With Additional Measures*” scenario (EPA, 2019).

7.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development will involve the construction of residential units, a crèche, community building, public open space and all associated infrastructure. The total gross site area comprises a c.13.03 hectare greenfield site. A full description of the proposed development can be found in Chapter 2.

7.4.1 Construction Phase

Air quality and climate impacts have been considered for both the construction and operational phases of the proposed development. During the construction phase of the development there will be different sources of potential air quality impacts, primarily construction dust emissions. Construction plant, machinery and site vehicles are a source of GHG emissions which have the potential to impact climate.

7.4.2 Operational Phase

The primary sources of air and climatic emissions in the operational context are deemed long term and will involve the change in traffic flows in the local areas which are associated with the development.

7.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

7.5.1 Construction Stage

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. The proposed development can be considered moderate in scale and therefore there is the potential for significant dust soiling 50 m from the source (TII, 2011) (Table 7.5). While construction dust tends to be deposited within 350 m of a construction site, the majority of the deposition occurs within the first 50 m. There are a number of high sensitivity receptors (residential properties) to the direct north and west of the site boundary. In the absence of mitigation there is the potential for significant, negative, short-term impacts to nearby sensitive receptors as a result of dust emissions from the proposed development.

Source		Potential Distance for Significant Effects (Distance from source)		
Scale	Description	Soiling	PM ₁₀	Vegetation Effects
Major	Large construction sites with high use of haul routes	100m	25m	25m
Moderate	Moderate sized construction sites with moderate use of haul routes	50m	15m	15m
Minor	Minor construction sites with limited use of haul routes	25m	10m	10m

Source: Appendix 8: Assessment of Construction Impacts taken from “*Guidelines for the treatment of Air Quality During the Planning & Construction of National Road Schemes*” (TII, 2011)

Table 7.5: Assessment Criteria for the Impact of Dust Emissions from Construction Activities with Standard Mitigation in Place

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 DMRB assessment criteria in Section 7.2.2. The construction stage traffic has the potential for a neutral, imperceptible and short-term impact on air quality.

Climate

There is the potential for a number of greenhouse gas emissions to atmosphere during the construction of the development. Construction vehicles, generators etc., may give rise to CO₂ and N₂O emissions. The Institute of Air Quality Management document *Guidance on the Assessment of Dust from Demolition and Construction* (IAQM, 2014) states that site traffic and plant is unlikely to make a significant impact on climate. Therefore, the potential impact on climate is considered to be imperceptible and short-term.

Human Health

Dust emissions from the construction phase of the proposed development have the potential to impact human health through the release of PM₁₀ and PM_{2.5} emissions. As per Table 7.5 significant PM₁₀ emissions can occur within 15m of the site for a development of this scale. There are a number of high sensitivity (residential) receptors to the direct north and west of the site a number of which are within 15m of the site boundary. Therefore, in the absence of mitigation there is the potential for slight, negative, short-term impacts to human health as a result of the proposed development.

7.5.2 Operational Phase

Air Quality

The potential impact of the proposed development has been assessed by modelling emissions from the traffic generated as a result of the development. The impact of NO₂ emissions for the opening and design years was predicted at the nearest sensitive receptors to the development. This assessment allows the significance of the development, with respect to both relative and absolute impacts, to be determined.

Transport Infrastructure Ireland’s document *Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes* (2011) detail a methodology for determining air quality impact significance criteria for road schemes and this can be applied to any development that causes a change in traffic. The degree of impact is determined based on both the absolute and relative impact of the proposed development. Results are compared against the ‘Do-Nothing’ scenario, which assumes that the proposed development is not in place in future years, in order to determine the degree of impact.

The results of the assessment of the impact of the proposed development on NO₂ in the opening year 2024 are shown in Table 7.6 and for design year 2039 are shown in Table 7.7. The annual average concentration is in compliance with the limit value at all worst-case receptors in 2024 and 2039. Concentrations of NO₂ are at most 40% of the annual limit value in 2024 and at most 41% in 2039. In addition, the hourly limit value for NO₂ is 200 µg/m³ and is expressed as a 99.8th percentile (i.e. it must not be exceeded more than 18 times per year). The maximum 1-hour NO₂ concentration is not predicted to be exceeded in any modelled year (Table 7.8).

The impact of the proposed development on annual mean NO₂ concentrations can be assessed relative to “Do Nothing (DN)” levels. Relative to baseline levels, there are predicted to be some imperceptible to small increases in NO₂ concentrations at receptors R1 – R4. Concentrations will increase by at most 1.7% of the annual limit value in 2024 and by 0.4% in 2039 at receptor R3. Using the assessment criteria outlined in Appendix 7.2, Table A7.2.1 and Table A7.2.2 the impact of the proposed development in terms of NO₂ is considered negligible. Therefore, the overall impact of NO₂ concentrations as a result of the proposed development is long-term, negative and imperceptible.

Concentrations of PM₁₀ were modelled for the baseline year of 2021. The modelling showed that concentrations were in compliance with the annual limit value of 40 µg/m³ at all receptors assessed, therefore, further modelling for the opening and design years was not required. Concentrations reached at most 1.1 µg/m³. When a background concentration of 14 µg/m³ is included the overall impact is 38% of the annual limit value at the worst case receptor.

The potential impact of the proposed development on ambient air quality in the operational stage is considered long-term, localised, negative and imperceptible and therefore, no mitigation is required.

Receptor	Opening Year 2024				
	DN	DS	DS-DN	Magnitude	Description
R1	15.7	16.2	0.52	Small Increase	Negligible
R2	11.7	12.2	0.45	Small Increase	Negligible
R3	12.0	12.6	0.69	Small Increase	Negligible
R4	11.2	11.5	0.36	Imperceptible Increase	Negligible

Table 7.6: Predicted Annual Mean NO₂ Concentrations – Opening Year 2024 (µg/m³)

Receptor	Design Year 2039				
	DN	DS	DS-DN	Magnitude	Description
R1	16.2	16.2	-0.02	Imperceptible Decrease	Negligible
R2	12.2	12.4	0.16	Imperceptible Increase	Negligible
R3	12.8	13.0	0.16	Imperceptible Increase	Negligible
R4	11.6	11.7	0.13	Imperceptible Increase	Negligible

Table 7.7: Predicted Annual Mean NO₂ Concentrations – Design Year 2039 (µg/m³)

Receptor	Opening Year 2024		Design Year 2039	
	DN	DS	DN	DS
R1	55	57	57	57
R2	41	43	43	43
R3	42	44	45	46
R4	39	40	41	41

Table 7.8: Predicted 99.8th percentile of Daily Maximum 1-hour NO₂ Concentrations (µg/m³)

Climate

There is the potential for a number of greenhouse gas emissions to atmosphere during the operational phase of the development. The predicted concentrations of CO₂ for the future years of 2024 and 2039 are detailed in Table 7.9. These are significantly less than the 2030 target set out under EU legislation. It is predicted that in 2024 the proposed development will increase CO₂ emissions by 0.00049% of the EU 2030 target. In 2039 CO₂ emissions will increase by 0.00025% of the 2030 target. Therefore, the potential climate impact of the proposed development is considered negative, long-term and imperceptible.

Year	Scenario	CO ₂
		(tonnes/annum)
2024	Do Nothing	947
	Do Something	1,108
2039	Do Nothing	1,220
	Do Something	1,302
Increment in 2024		160.5 Tonnes
Increment in 2039		81.1 Tonnes
Emission Ceiling (kilo Tonnes) 2030		32,860 ^{Note 1}
Impact in 2024 (%)		0.00049 %
Impact in 2039 (%)		0.00025 %

^{Note 1} Target under Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual greenhouse gas 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

Table 7.9: Climate Impact Assessment

Human Health

Traffic related air emissions have the potential to impact air quality which can affect human health. However, air dispersion modelling of traffic emissions has shown that levels of all pollutants are below the ambient air quality standards set for the protection of human health. It can be determined that the impact to human health during the operational stage is long-term, negative and imperceptible and therefore, no mitigation is required.

7.6 POTENTIAL CUMULATIVE IMPACTS

According to the IAQM guidance (2014) should the construction phase of the proposed development coincide with the construction of any other permitted developments within 350m of the site then there is the potential for cumulative dust impacts to the nearby sensitive receptors. The proposed development boundary overlaps with that of permitted development Reg. Ref.: 10174; ABP Ref: PL15.238053 (as amended) at the western boundary and will supersede granted development in this area. In addition, the proposed development is part of a wider masterplan for the site. A review of recent planning permissions for the area was conducted and it was found that there were no other developments of significance in the vicinity of the proposed development site with the potential for cumulative impacts.

There is the potential for cumulative dust impacts to nearby residential properties should the construction phase of the development coincide with that of the wider masterplan area. The dust mitigation measures outlined in Appendix 7.3 will be applied throughout the construction phase of the proposed development which will avoid significant cumulative impacts on air quality. With appropriate mitigation measures in place, the predicted cumulative impacts on air quality associated with the construction phase of the proposed development are deemed short-term, negative and imperceptible.

According to the IAQM guidance (2014) site traffic, plant and machinery are unlikely to have a significant impact on climate. Therefore, cumulative impacts are not predicted.

Cumulative impacts have been incorporated into the traffic data supplied for the operational stage air and climate modelling assessments where such information was available. The results of the modelling assessment (section 7.5.2) show that there is a long-term, negative and imperceptible impact to air quality and climate during the operational stage.

7.7 'DO NOTHING' IMPACT

The Do Nothing scenario includes retention of the current site without the proposed development in place. In this scenario, ambient air quality at the site will remain as per the baseline and will change in accordance with trends within the wider area (including influences from potential new developments in the surrounding area, changes in road traffic, etc).

7.8 AVOIDANCE, REMEDIAL & MITIGATION MEASURES

There is the potential for a number of impacts to air quality and climate during the construction and operational phases of the proposed development. Construction dust emissions are considered the primary source of air quality impacts associated with the proposed development. To avoid any potential significant impacts the following mitigation measures have been proposed.

7.8.1 Construction Phase

Air Quality

The proactive control of fugitive dust will ensure the prevention of significant emissions. The key aspects of controlling dust are listed below. Full details of the dust management plan can be found in Appendix 7.3. These measures have been incorporated into the overall Construction Environmental Management Plan (CEMP) prepared in respect of the proposed development.

In summary the measures which will be implemented will include:

- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic.
- Any road that has the potential to give rise to fugitive dust will be regularly watered, as appropriate, during dry and/or windy conditions.
- Vehicles exiting the site shall make use of a wheel wash facility where appropriate, prior to entering onto public roads.
- Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced site road, this will be 20 kph, and on hard surfaced roads as site management dictates.
- Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- During movement of materials both on and off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.

At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

Climate

Construction stage traffic and embodied energy of construction materials are expected to be the dominant source of greenhouse gas emissions as a result of the construction phase of the development. Construction vehicles, generators etc., may give rise to some CO₂ and N₂O emissions. However, due to short-term nature of these works, the impact on climate will not be significant.

Nevertheless, some site-specific mitigation measures will be implemented during the construction phase of the proposed development to ensure emissions are reduced further. In particular, the prevention of on-site or delivery vehicles from leaving engines idling, even over short periods. Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.

7.8.2 Operational Stage

The impact of the operational traffic associated with proposed development on air quality and climate is predicted to be imperceptible with respect to the operational phase in the long term. Therefore, no additional site specific mitigation measures are required.

Impacts to climate can occur as a result of electricity usage for heating and lighting from the proposed development. However, the proposed development has been designed to reduce the impact to climate as much as possible during the operational phase. The Energy Report prepared by MANDE Consulting Ltd. in support of this planning application outlines the measures to be implemented to reduce impacts to climate. The residential units will comply with the Part L (2019) building regulations and will be Nearly Zero Energy Buildings (NZEB) compliant. The residential units will achieve a minimum Building Energy Rating (BER) of A2 and the commercial units will have a minimum A3 rating. The key design elements outlined in the Energy Report include:

- High-performance thermal envelope with low U-values for the fabric
- Airtight construction
- Ventilation system
- Heat Pump (HP) Technology or Highly efficient Gas boiler & Photo-Voltaic (PV) Panels
- Energy efficient lighting to be used throughout.

Full descriptions of the measures proposed and their benefits are outlined within the Energy Report submitted with this application.

7.9 MONITORING

7.9.1 Construction Stage

Monitoring of construction dust deposition at 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 between 28 - 32 days.

7.9.2 Operational Stage

There is no monitoring recommended for the operational phase of the development as impacts to air quality and climate are predicted to be imperceptible.

7.10 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

7.10.1 Construction Stage

Air Quality

Once the dust minimisation measures outlined in Section 7.8 and Appendix 7.3 are implemented, the impact of the proposed development in terms of dust soiling will be short-term, negative, localised and imperceptible at nearby receptors.

Climate

According to the IAQM guidance (2014) site traffic, plant and machinery are unlikely to have a significant impact on climate. Therefore, the predicted impact is neutral, short-term and imperceptible.

Human Health

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 impact of construction of the proposed development is likely to be negative, short-term, localised and imperceptible with respect to human health.

7.10.2 Operational Stage

Air Quality

Air dispersion modelling of operational traffic emissions associated with the proposed development was carried out using the UK DMRB model. The modelling assessment determined that the change in emissions of NO₂ at nearby sensitive receptors as a result of the proposed development will be imperceptible. Therefore, the operational phase impact to air quality is long-term, localised, negative and imperceptible.

Climate

Climate change has the potential to alter weather patterns and increase the frequency of rainfall in future years. As a result of this there is the potential for flooding related impacts on site in future years. A detailed flood risk assessment has been undertaken as part of this planning application and adequate attenuation and drainage have been provided for to account for increased rainfall in future years. Therefore, the impact will be imperceptible.

Modelling of operational phase CO₂ emissions as a result of the traffic associated with the proposed development was carried out to determine the impact to climate. It was found that emissions of CO₂ will increase by an imperceptible amount as a result of the proposed development and are significantly below the EU 2030 GHG target. The operational phase impact to climate is long-term, negative and imperceptible. In addition, the proposed development has been designed to reduce the impact to climate where possible during operation.

Human Health

As the 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 long-term, negative and imperceptible.

7.11 REINSTATEMENT

Not applicable to air quality and climate.

7.12 INTERACTIONS

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 and therefore the predicted impact is short-term, negative and imperceptible with respect to the construction phase and long-term, negative and imperceptible with respect to the operational phase in terms of human health impacts.

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 imperceptible.

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. No other significant interactions with air quality have been identified.

7.13 DIFFICULTIES ENCOUNTERED IN COMPILING

There were no difficulties encountered when compiling this assessment.

8.0 NOISE & VIBRATION

8.1 INTRODUCTION

This chapter assesses the likely noise and vibration impacts associated with the proposed residential development on a c. 13.03-hectare site at Bridgegate, Rathgory & Mulladrillen, Drogheda Road, Ardee, County Louth.

The proposed development will involve the construction of residential units a crèche and playground and a single storey community building, public open space, and all associated infrastructure. A full description of the proposed development can be found in Chapter 2.

Mitigation measures are included, where relevant, to ensure the proposed development is constructed and operated in an environmentally sustainable manner to ensure minimal impact on the receiving environment.

This chapter was completed by Dermot Blunnie, Senior Acoustic consultant at AWN Consulting Ltd (AWN). He holds a BEng (Hons) in Sound Engineering, MSc in Applied Acoustics and has completed the Institute of Acoustics (IOA) Diploma in Acoustics and Noise Control. He has been working in the field of acoustics since 2008 and been a consultant with AWN for over 7 years. He is a corporate member of the Institute of Engineers Ireland (MIEI) and the Institute of Acoustics (MIOA).

8.2 STUDY METHODOLOGY

The assessment of impacts for the proposed development has been undertaken with reference to the most appropriate guidance documents relating to environmental noise and vibration which are set out in section 8.2.1. In addition to these specific guidance documents, the following guidelines and policy documents were considered and consulted when preparing this EIAR chapter:

- EPA Guidelines on the Information to be Contained in Environmental Impact Statements, (EPA, 2002).
- EPA Advice Notes on Current Practice (in the preparation of Environmental Impact Statements), (EPA, 2003).
- EPA Advice Notes for Preparing Environmental Impact Statements, (Draft, September 2015).
- EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports Draft August 2017 (EPA, 2017).
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017).
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018).
- Louth County Development Plan 2021 – 2027 (Louth County Council, 2021).

The study has been undertaken using the following outline methodology:

- Review of relevant guidance to identify appropriate criteria for the development.
- Conduct a noise monitoring survey to identify the existing noise environment in the vicinity of the development site and nearest noise sensitive locations (NSLs).
- Predict the levels of typical noise emissions at the nearest noise sensitive locations for both the construction and operational phases.
- Predict the relative change in noise levels at the nearest NSLs due to the expected increase in road traffic for the operational phases.
- Assess the impact by comparing the calculated levels against the relevant criteria.
- Where necessary, present ameliorative, remedial, or reductive measures to control the impacts to be within the criteria.

- Present the predicted impact of the proposed development including the ameliorative, remedial, or reductive measures, and
- Describe the significance of the residual noise and vibration effects associated with the proposed development.

Appendix 8.1 presents the fundamentals of acoustics and Appendix 8.2 presents a glossary of acoustic terms.

8.2.1 Assessment Criteria

8.2.1.1 Construction Phase – Noise

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 consider noise limits at their discretion. However, there are several publications commonly used in Ireland to set appropriate construction noise criteria. Each of these is discussed in the following paragraphs.

TII Guidelines

Transport Infrastructure Ireland (TII) (formerly National Roads Authority (NRA) publication Guidelines for the Treatment of Noise and Vibration in National Road Schemes contains information on the permissible construction noise levels for various hours of operation. The noise level limits are outlined in Table 8.1.

Table 8.1: TII Maximum Allowable Construction Noise Levels at Dwellings

Period	Noise Levels (dB re. 2×10^{-5} Pa)	
	$L_{Aeq}(1,hr)$	L_{Amax}
Monday to Friday 07:00 to 19:00hrs	70	80
Monday to Friday 19:00 to 22:00hrs	60*	65*
Saturdays 08:00 to 16:30hrs	65	75
Sundays & Bank Holidays 08:00 to 16:30hrs	60*	65*

Note * Construction activity at these times, other than that required for emergency works, will normally require the explicit permission of the relevant local authority.

British Standard BS5228

Potential noise impacts during the construction phase of a project are often assessed in accordance with British Standard BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise*.

BS5228-1:2009+A1 gives several examples of acceptable limits for construction or demolition 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”.

For residential properties it is considered appropriate to adopt the 70 dB(A) criterion for periods between 07:00hrs to 19:00hrs Monday to Friday and 65 dB(A) criterion for periods between 08:00hrs to 16:30hrs on Saturdays.

The proposed construction hours, subject to agreement with the Planning Authority, are set out in the Construction Management Plan (CMP) submitted with this application and are 08:00hrs to 20:00hrs Monday to Friday and 08:00hrs to 16:00hrs on Saturdays.

It may be necessary for some construction operations to be undertaken outside these times, for example: service diversions and connections; concrete finishing and fit-out works; etc. There may also 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.

8.2.1.2 Construction Phase – Vibration

Vibration standards come in two varieties: those dealing with human comfort and those dealing with cosmetic or structural damage to buildings. In both instances, it is appropriate to consider the magnitude of vibration in terms of Peak Particle Velocity (PPV).

Building Damage

In terms of vibration, British Standard BS 5228-2:2009+A1:2014 *Code of practice for vibration control on construction and open sites – Vibration* recommends that, for soundly constructed residential property and similar 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. Taking the above into consideration the vibration criteria in Table 8.2 are recommended.

Table 8.2: Allowable vibration during construction phase

Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of:		
Less than 15 Hz	15 to 40 Hz	40 Hz and above
15 mm/s	20 mm/s	50 mm/s

Human Response

Section B.2 of BS5228-2 addresses human response to vibration and identifies thresholds vibration can cause annoyance or interfere with work activities. Vibration typically becomes perceptible at around 0.15 to 0.3 mm/s and may become disturbing or annoying at higher magnitudes. Higher levels of vibration are typically tolerated for single events or events of short-term duration, particularly during construction projects and when the origin of vibration is known. For example, piling can typically be tolerated at vibration levels up to 2.5mm/s during the daytime and the evening if those affected are aware of the timeframe and origin of the vibration.

8.2.1.3 Operational Phase – Noise

The potential noise impacts associated with the proposed development are limited to:

- Additional traffic on public roads.
- Mechanical plant serving the development, and
- Noise from crèche outdoor play area.

Appropriate assessment criteria in relation to each of the above are discussed in the following paragraphs.

Additional Traffic on Public Roads – Operational Phase

There are no specific guidelines or limits relating to traffic related sources along the local or surrounding roads. Given that traffic from the development will make use of existing roads already carrying traffic volumes, it is appropriate to assess the calculated change in traffic noise levels that will arise because of vehicular movements associated with the proposed development. To assist with the interpretation of the noise from additional vehicular traffic on public roads, it is proposed to adopt guidance from United Kingdom Highways Agency (UKHA) Design Manual for Roads and Bridges (DMRB) 2020.

Table 8.3, taken from Section 3.54 of DMRB, presents guidance as to the likely impact associated with any short-term (opening year) or long-term (future year) change in the traffic noise level (dB, $L_{A10,18hr}$ or L_{night}) at a noise sensitive receiver.

Table 8.3: Likely Impacts with a Change in Traffic Noise Levels – Operational Phase

Magnitude of Impact	Increase in Existing Traffic Noise Level (dB, $L_{A10,18hr}$ or L_{night}):	
	Long Term	Short Term
Negligible	<3.0	<1.0
Minor	3.0 – 4.9	1.0 – 2.9
Moderate	5.0 – 9.9	3.0 – 4.9
Major	≥10	≥5

The DMRB guidance outlined above will be used to assess the predicted increases in traffic levels on public roads associated with the proposed development and comment on the likely impacts.

Building Services Noise

The most appropriate standard used to assess the impact of a new continuous source (i.e. plant items) on a residential environment is BS4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound* (BS4142). 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, τ . This level has been determined with reference to manufacturers information for specific plant items.
- “*Rating level*” $L_{Ar, T}$ 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.

The assessment procedure in BS4142 is outlined as follows:

- Step 1: Determine the specific noise level.
- Step 2: Determine the rating level as appropriate.
- Step 3: Determine the background noise level.
- Step 4: Subtract the background noise level from the specific noise level 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 +10 dB or more is a likely to be an indication of a significant adverse impact. A difference of around +5 dB 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 impacts are typically considered to be neutral.

Assessment of Other Noise Sources

For other noise sources not related to traffic or building services, appropriate guidance on internal noise levels for dwellings is contained within BS 8233:2014: *Guidance on Sound Insulation and Noise Reduction for Buildings* (BS8233). This British Standard sets out recommended noise limits for indoor ambient noise levels in dwellings as set out in Table 8.4.

Table 8.4: Recommended Indoor Ambient Noise Levels

Activity	Location	(07:00 to 23:00hrs)	(23:00 to 07:00hrs)
Resting	Living Room	35 dB $L_{Aeq, 16hr}$	-
Dining	Dining Room/Area	40 dB $L_{Aeq, 16hr}$	-
Sleeping (Daytime Resting)	Bedroom	35 dB $L_{Aeq, 16hr}$	30 dB $L_{Aeq, 8hr}$

For the purposes of this study, it is appropriate to derive external limits based on the internal criteria noted in Table 8.4. This is done by factoring in the degree of noise reduction afforded by a partially open window, Annex G in BS 8233:2014 (BSI 2014c) comments that, ‘...*If partially open windows were relied upon for background ventilation, the insulation would be reduced to approximately 15 dB...*’ although it is also acknowledged that the level difference through a window partially open for ventilation can vary depending on window type. Therefore, to provide a worst-case assessment, an inside to outside level difference of 10 dB has been used. In summary, the following external noise levels are proposed for other operational noise sources.

- Daytime / Evening (07:00 to 23:00 hours) 45 dB $L_{Aeq, 1hr}$
- Night-time (23:00 to 07:00 hours) 40 dB $L_{Aeq, 15min}$

These criteria conform with the following guidance taken from the World Health Organisation publication “Community Noise” which states:

“To protect the majority of people from being seriously annoyed during the daytime, the sound pressure level should not exceed 55 dB L_{Aeq} .”

At night-time outdoors, sound pressure levels should not exceed 45 dB L_{Aeq} , so that people may sleep with bedroom windows open.”

As there is the potential for short periods of noise to cause a greater disturbance at night-time, a shorter assessment period (T) is adopted. Appropriate periods are 1 hour for day / evening time (07:00 to 23:00 hours) and 15 minutes for night-time (23:00 to 07:00 hours).

8.2.1.4 Operational Phase – Vibration

Due to the nature of the proposed development, no significant sources of vibration are expected to arise during the operational phase. Operational vibration has therefore not been assessed further in this chapter.

8.2.2 EPA Description of Effects

The significance of effects of the proposed development shall be described in accordance with the EPA guidance document *Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR)*, August 2017. Summary details of the methodology for describing the significance of the effects are provided in Chapter 1 of this EIAR.

The effects associated with the proposed development are described with respect to the EPA guidance in the relevant sections of this chapter.

8.3 RECEIVING ENVIRONMENT

The subject site is situated on greenfield lands approximately 350 m east of the N2 road at Bridgewater, Ardee, Co. Louth. There are existing residential developments along the western and northern boundaries of the site, some of which are under construction. The nearest noise sensitive locations (NSLs) to the proposed development have been identified through site visits and review of published maps, drawings, and aerial photography.

8.3.1 Environmental Noise Survey

An environmental noise survey has been conducted at the site to determine the typical baseline noise environment in the vicinity of the nearest noise sensitive receptors to the proposed development site. The survey was conducted in general accordance with ISO 1996: 2017: *Acoustics – Description, measurement, and assessment of environmental noise*. Specific details are set out below.

An attended noise survey was conducted at the site between 12:55hrs and 17:30hrs on 26 August 2020. The measurement periods cover a period that was selected to provide a typical snapshot of the existing noise climate, with the primary purpose being to ensure that the proposed noise criteria associated with the development are commensurate with the prevailing environment. The weather during the survey periods was dry and overcast with winds ranging between 1 and 2 m/s and temperatures of some 17° C.

8.3.1.1 Choice of Measurement Locations

Measurement locations were selected at four locations as shown in Figure 8.1 below.



Figure 8.1: Noise Monitoring Locations

Each of the Noise Monitoring Locations (NML) selected for measurement are described below.

- NML1** Located in Rathgory residential estate the vicinity of the southwest boundary of the site and is deemed to be representative of the prevailing noise levels at noise sensitive receptors in this area.
- NML2** Located in Moorehall Close residential estate the vicinity of the western boundary of the site and is deemed to be representative of the prevailing noise levels at noise sensitive receptors in this area.
- NML3** Located at the northern boundary of the site on at residential receptors on Hale Street and deemed to be representative of the prevailing noise levels at noise sensitive receptors located in this area.
- NML4** Located at the north eastern boundary of the site on at residential receptors in Moorehall Rise and deemed to be representative of the prevailing noise levels at noise sensitive receptors located in this area.

8.3.1.2 Equipment and Personnel

AWN Consulting undertook the noise survey. The measurements were carried out using a Brüel & Kjaer Type 2250 Sound Level Meter (SLM) (Serial Number 2818080). The SLM was set to measure at intervals of 15 minutes and was check-calibrated before and after the survey using a Brüel and Kjaer Type 4231 Calibrator.

8.3.1.3 Measurement Parameters

The noise survey results are presented in terms of the following parameters.

- L_{Aeq}** 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.
- L_{A90}** is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.
- L_{AFmax}** is the instantaneous maximum sound level measured during the sample period using the ‘F’ time weighting.
- L_{day,16-hr}** is the average L_{Aeq} noise level measured over the course of the daytime period, defined as 07:00hrs to 23:00hrs
- L_{night}** is the average L_{Aeq} noise level measured over the course of the night-time period, defined as 23:00hrs to 07:00hrs

The “A” suffix denotes the fact that the sound levels have been “A-weighted” to account for the non-linear nature of human hearing. All sound levels in this report are expressed in terms of decibels (dB) relative to 2×10^{-5} Pa.

8.3.1.4 Survey Results

The survey results are summarised in Table 8.5 below and discussed in the following sections.

Table 8.5: Summary of Measured Noise Levels

Location	Time	Measured Noise levels (dB re. 2×10^{-5} Pa)				
		L _{Aeq}	L _{AFmax}	L _{AFmin}	L _{AF10}	L _{AF90}
NML1	12:55	47	67	38	49	40
	14:24	49	78	39	52	42
	16:07	48	70	38	49	42
NML2	13:15	47	66	37	49	41
	14:46	49	68	42	52	45
	16:29	47	62	39	49	43
NML3	13:40	41	62	36	43	38
	15:09	56	69	38	60	43
	16:55	42	64	34	44	37
NML4	14:03	42	64	34	44	37
	15:30	45	62	36	47	38
	17:14	47	64	37	49	39

NML1

Road traffic noise from the N2 was steady and dominated the background noise environment. Intermittent noises from nearby houses were noted and distant intermitted construction site noise were also audible in the background.

NML2

Road traffic noise from the N2 was steady and dominated the background noise environment. Intermitted noise from construction groundworks were audible from the site to the north.

NML3

Distant road traffic noise was audible in the background at a low level. Noise from children playing in the neighbourhood and birdsong were noted. During the second round of measurements the noise levels were elevated due to a lawnmower operating in the area.

NML4

Occasional traffic noise from local passing cars, in addition to noise from activity at nearby house and children playing in the neighbourhood were noted as the main sources. Distant road traffic noise and lawnmowers were noted to be audible in the background.

The measured daytime average ambient noise levels at all locations were typically between 42 to 47 dB $L_{Aeq, 15\text{-mins}}$, with background average noise levels typically ranging from 38 to 44 dB $L_{A90, 15\text{-mins}}$.

8.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

A full description of the proposed development is provided in Chapter 2. When considering a development of this nature, the potential noise and vibration impacts on the surroundings must be considered for each of two distinct stages:

- construction phase, and
- operational phase.

The construction phase will involve site clearing and excavations, services installations, building construction, landscaping, and construction of internal roads. The construction phase will generate the highest potential noise impact due to the nature of works involved. However, it is important to note that the phase is short term, and highest potential impacts, which are directly related to the distance from the noise sensitive receiver to construction works, reduce as works progress and move to other locations within the site.

The primary potential sources of outward noise in the operational context are long term and will comprise traffic movements to and from the development site using the existing road network, building services plant noise and noise from outdoor play area of the Crèche. These issues are discussed in detailed in the following sections.

8.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

The potential impacts of the proposed development are considered for the short-term construction phase and long-term permanent operational phase. In the absence of mitigation, the impacts arising assessed separately in the following sections.

8.5.1 Construction Phase

8.5.1.1 Noise

The construction programme has been established in outline form only. Given that works during the various construction phases will be transient in nature and will involve the use of several different plant items at any one time, it is difficult at this stage of the assessment to state accurately what items of plant will be in use and what levels of noise will be experienced during construction works. To assess the range of potential noise levels associated with the construction phase, indicative noise prediction calculations have been prepared in relation to construction activities. The calculations have been undertaken in line with guidance set out in British Standard BS 5228 (2009 +A1 2014): *Code of practice for noise and vibration control on construction and open sites – Part 1: Noise*. Table 8.6 outlines plant items and associated noise levels that are typically anticipated with various phases of the construction programme at a standard reference distance of 10 metres.

Table 8.6: Summary of Measured Noise Levels

Construction Stage	Item of Plant (BS 5228-1:2009+A1:2014 Ref.)	Construction Noise Level at Reference 10m Distance LAeq,T (dB)
Site Clearance	Tracked excavator (C2.21)	71
	Dump Truck (C2.30)	79
	Dozer (C2.10)	83
Groundworks	HGV Movements	79
	Tracked excavator (C2.21)	71
	Concrete Pump (C3.25)	78
	Tracked Mobile Crane (C4.50)	71
Building Construction	Diesel Generator (C4.76)	61
	Tower Crane (C4.49)	77
	HGV Movements	79
	Hand Held Circular Saw (C4.72)	79
	Telescopic Handler (C4.54)	79
	Concrete Pump & Cement Mixer Truck (C4.24)	67
Landscaping	Dump Truck (C2.30)	79
	Wheeled Loader Lorry (D3 1)	75
	Surfacing (D8.25)	68

The site is surrounded by several Noise Sensitive Locations (NSLs) set back at varying distances from the construction works. Most of the time, the works will occur at distances of between 50 to 200 m from the nearest NSLs. At a worst case, when constructing occurs along boundary locations some of the works will take place at distances of around 25 m from NSLs. The worst-case noise levels are not expected to occur over the full duration of the construction programme; they will be intermittent and only occur at the closest point to an NSL for short periods. For most of the construction phase, work will take place at greater distances than those assumed in the assessment. Predicted construction noise levels for varying setback distances can be described as representative of the likely worst-case.

Table 8.7 presents the predicted daytime noise levels from indicative construction stages on site. The calculations assume that the equipment will operate for 50% of the 12-hour working day (i.e., 6 hours) and that boundary screening in the form of site hording, typically 2.4m high shall be erected between locations of significant works and NSL's within c. 45m from these works. It is assumed that construction works will take place during normal daytime working hours only, unless agreed with Louth County Council.

Table 8.7: Summary of Measured Noise Levels

Construction Stage	Item / Activity	Construction Noise Level $L_{Aeq,T}$ (dB) at Distance			
		25m	50m	100m	200m
Site Clearance	Tracked excavator	55	49	43	37
	Dump Truck	63	57	51	45
	Dozer	67	61	55	49
Stage Cumulative		69	63	57	51
Groundworks	HGV Movements	63	57	51	45
	Tracked excavator	55	49	43	37
	Concrete Pump	62	56	50	44
	Tracked Mobile Crane	55	49	43	37
Stage Cumulative		66	60	54	48
Building Construction	Diesel Generator	45	39	33	27
	Tower Crane	61	55	49	43
	HGV Movements	63	57	51	45
	Hand Held Circular Saw	63	57	51	45
	Telescopic Handler	63	57	51	45
	Concrete Pump & Cement Mixer Truck	51	45	39	33
Stage Cumulative		69	63	57	51
Landscaping	Dump Truck	63	57	51	45
	Wheeled Loader Lorry	59	53	47	41
	Surfacing	52	46	40	34
Stage Cumulative		65	59	53	47

Considering the assessment assumptions and allowing for the attenuation of sound over distance and screening where appropriate, the worst-case construction noise levels do not exceed the criteria outlined in Section 8.2.1.1. As most construction works will occur at distances between 50 to 200m the construction noise levels at NSLs are expected to be well below the assessment criteria. At some locations where construction activities are expected to occur near the boundary close to NSLs, predicted noise levels are approaching significant and the contractor will need to consider mitigation measures to ensure that construction noise impacts are minimised.

The assessment has concluded the likely construction noise levels will be below the threshold of significant impact, however there is still a potential for short term impacts of moderate significance at the nearest NSLs. To minimise potential impacts during the construction phase best practice mitigation measures set out in Section 8.8 shall be adopted by the contractor.

8.5.1.2 Vibration

In terms of construction vibration, it is anticipated that excavations will be made using standard excavation machinery in the soft ground and will not extend to bedrock level. These excavations typically do not generate appreciable levels of vibration close to the source. Taking this into account and considering the distance that these properties are from the works and the attenuation of vibration over distance, the resultant vibration is expected to be well below a level that would cause disturbance to building occupants or even to be perceptible. Notwithstanding the above, the contractor will ensure that works do not give rise to offsite levels of vibration that will exceed the criteria outlined in Section 8.2.1.2.

8.5.2 Operational Phase

The primary potential sources of outward noise in the operational context are long term and will comprise traffic movements to and from the development site using the existing road network, building services plant noise and noise from outdoor play area of the crèche. Each of these are discussed in the following sections.

8.5.2.1 Additional Traffic on Surrounding Roads

During the operational phase of the proposed development, there will be an increase in vehicular traffic associated with the site and other planned developments on surrounding roads. Traffic flow information was obtained from CS Consulting on 22/03/2021 for the purposes of this assessment. Data for the Do Nothing and Do Something scenarios for the opening year 2024 and design year 2039 were provided. The traffic data is detailed in Table 8.8 with the %HGV shown in parenthesis below the AADT.

Table 8.8: Traffic Data Used for Assessments

Link	Road Name	Speed (kph)	Opening Year 2024		Design Year 2039	
			Do Nothing	Do Something	Do Nothing	Do Something
A	N2 Bridge Street (to north of R170)	50	14,352 (7.4%)	16,848 (7.1%)	18,117 (7.8%)	19,564 (7.3%)
B	R170 William Street / Moorehall (to east of N2)	50	7,789 (3.9%)	9,012 (3.8%)	9,663 (4.2%)	10,177 (4%)
C	John Street (to west of N2)	50	6,889 (3.2%)	7,602 (3.2%)	8,147 (3.5%)	8,309 (3.5%)
D	N2 Drogheda Road (to south of John Street)	60	10,294 (8.8%)	13,090 (7.8%)	14,033 (8.7%)	16,156 (7.6%)
E	N2 Drogheda Road (to south of Bridgewater access)	60	10,095 (9.1%)	11,678 (8.8%)	12,604 (9.7%)	13,500 (9.1%)

The predicted change in noise levels due to an increase in road traffic has been calculated for each of the road links. 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 surrounding the subject site with and without development using the Annual Average Daily Traffic (AADT) data.

The impact from the increase in traffic from the proposed development has been assessed for the opening year of 2024 and the design year of 2039 relative to the 'Do Nothing' scenario along the sections of road detailed in Table 8.9.

Table 8.9: Increase in Road Traffic Noise Due to Proposed Development

Link	Noise Level Increase between Do Nothing and Do Something AADT Traffic (dB LA10)	
	2024	2039
A	<1	<1
B	<1	<1
C	<1	<1
D	<1	<1
E	<1	<1

The predicted increase in traffic flows associated with the development in the years 2024 and 2039 will result in an imperceptible increase of less than 1 dB along all roads receiving traffic from the proposed development. With respect to the assessment criteria presented in Table 8.3 of Section 8.2.1.3, additional traffic on public roads will have a negligible impact in both the short-term (i.e. opening year, 2024) and the long-term (i.e. design year, 2039).

8.5.2.2 Building Services Noise

There will be no building services plant associated with the residential development that would give rise to any potential impacts at any sensitive receptors. The potential for building services noise impacts is therefore limited to the any plant serving the crèche and community building. These items and their location will be selected at the detailed design stage to ensure that noise emissions to sensitive receivers both external and within the development itself will be within the relevant criteria set out in Section 8.2.1.3.

8.5.2.3 Noise from Crèche Outdoor Play Area

The proposed crèche will have an associated outdoor play area. The nearest NSL to this outdoor play area is NSL2 at approximately 15 m. For this assessment, the noise screening that will provide be provided by the boundary fence between the crèche outdoor play area and the nearest NSL has been considered.

Measurement of noise levels generated by children playing outdoors at several crèches and kindergartens indicate typical noise levels in the order of 56 dB LAeq,1hr at distance of 5 metres. Considering the distance of 15 m to the nearest NSL and the line of sight screening afforded by a c. 1.8m high solid boundary fence, the calculated noise level from the outdoor creche area at NSL2 is 43 dB LAeq,1hr. This level is expected to be below the recommended daytime criterion of 45 dB LAeq,1hr outlined in Section 8.2.1.3.

8.6 POTENTIAL CUMULATIVE IMPACTS

8.6.1 Construction Phase

Given that the site is bounded by residential development, it is not expected there will be any other construction activities that would give rise to significant cumulative impacts. Any significant construction activity that may coincide with this development will therefore occur at such a distance from the proposed development that there would be no cumulative noise and vibration impacts. Cumulative impacts during the construction phase can be described as not significant.

8.6.2 Operational Phase

There is potential for cumulative impacts in relation to the increased traffic volumes from other developments (such as Phases 1-3). This has been accounted for in the traffic analysis and flow data used in the assessment, therefore the potential cumulative impacts have been considered and are assessed in Section 8.5.2.1.

8.7 'DO NOTHING' SCENARIO

The Do Nothing scenario includes retention of the current site without the proposed development in place. In this scenario, ambient noise and vibration at the site will remain as per the baseline and will change in accordance with trends within the wider area (including influences from potential new developments in the surrounding area, changes in road traffic, etc).

8.8 MITIGATION MEASURES

8.8.1 Construction Phase Mitigation

To ameliorate the likely noise impacts, a schedule of noise control measures has been formulated for the construction phase.

The main contractor will be required to follow and implement appropriate mitigation measures to minimise significant impacts at receptor locations. 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).
- 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.

8.8.1.1 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 shall be selected wherever practical.

8.8.1.2 Noise Control at Source

If replacing a noisy item of plant is not a viable or practical option, consideration will 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 considered. Items suitable for enclosure include pumps and generators.

BS5228 makes several 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:

- 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 10 dB. Mobile plant should be switched off when not in use and not left idling.
- For percussive tools such as pneumatic concrete breakers several 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 proximity to noise sensitive boundaries.
- For concrete mixers, control measures will 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 the 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.

8.8.1.3 Screening

Screening is typically 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 construction site layout will 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 will be considered when percussive works are taking place in proximity to the nearest sensitive perimeter buildings

It is noted that the main contractor shall secure the site with barriers and hoarding in accordance with the final Detailed Construction Management Plan. Solid hoarding shall be used to provide noise screening where possible when significant constructions works are expected to occur in proximity to noise sensitive locations.

8.8.1.4 Liaison with the Public

A designated noise liaison will be appointed to site during construction works. All noise complaints will be logged and followed up in a prompt fashion by the liaison officer. In addition, prior to any anticipated noisy construction activity, the liaison officer should inform the nearest noise sensitive locations of the time and expected duration of the works.

8.8.1.5 Monitoring

During the construction phase consideration may be given to noise and vibration monitoring at the nearest sensitive locations, where high level of noise and or vibration are expected.

Noise monitoring shall be conducted in accordance with the International Standard ISO 1996: 2017: *Acoustics – Description, measurement and assessment of environmental noise* and be located greater than 3.5m away from any reflective surfaces, e.g., walls, to ensure a free-field measurement without any influence from reflected noise sources.

Noise monitoring will be established on site throughout the duration of the project. Noise monitoring shall be carried out for a period of at least 2 weeks prior to any works commencing, to establish current baseline noise levels. The results of the baseline noise survey shall be communicated to Louth County Council in the form of a technical report.

8.8.2 Operational Phase Mitigation

During the operational phase of the development, the impact assessment has found that there are no significant noise impacts likely at nearby noise sensitive locations. Therefore, noise mitigation measures with respect to the outward impacts from the development are not deemed necessary.

8.9 PREDICTED RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

This section summarises the findings of the assessment and the noise and vibration impact with respect to the EPA's criteria for describing effects. The likely effects are described considering the mitigation measures outlined.

8.9.1 Construction Phase

8.9.1.1 Noise

During the construction phase of the project there will be a short-term noise impact on nearby noise sensitive properties from site activities in proximity to NSLs. The application of binding noise limits, hours of operation, along with implementation of appropriate noise and vibration control measures will ensure that noise and vibration impacts are kept to a minimum in so far as practicable.

The likely noise effects during the construction phase at nearby noise sensitive locations can be described as Negative, Moderate and Short-term. The above effects should be considered in terms that the effect is variable, and that this assessment considers the locations of the greatest potential impact.

8.9.1.2 Vibration

The likely residual vibration effects during the construction phase at nearby sensitive locations can be described as neutral, imperceptible, and short-term.

8.9.2 Operational Phase

8.9.2.1 Additional Traffic on Surrounding Roads

The change in noise levels along all routes in the existing road network associated with additional traffic from the proposed development is predicted to be less than 1 dB. The assessment of traffic was cumulative as that the traffic values included increased traffic volumes from other developments. The likely effect can be described as Negative, Imperceptible and Long-term.

8.9.2.2 Building Services Noise

Any noise from building services is expected to be imperceptible at all NSLs. The likely potential effects can be described as Neutral, Imperceptible and Long-term.

8.9.2.3 Noise from Creche Outdoor Play Area

The assessment has found that potential noise from the proposed outdoor play area will be well within the criteria and is expected to be below existing ambient noise levels in the vicinity of NSLs surrounding the site. The proposed construction hours, subject to agreement with the Planning Authority, are set out in the Construction Management Plan (CMP) submitted with this application and are 08:00hrs to 20:00hrs Monday to Friday and 08:00hrs to 16:00hrs on Saturdays. The likely potential effects can be described as Negative, Slight and Long-term in the immediate vicinity and imperceptible, long term in the wider environs.

8.10 MONITORING

During the construction phase, noise and vibration monitoring shall be carried out by the contractor to ensure that the recommended threshold levels set out in the EIAR Chapter, or any noise and vibration limits imposed as a condition of planning are not exceeded.

8.11 REINSTATEMENT

Not applicable to Noise and Vibration

8.12 INTERACTIONS

The potential interaction between Noise and Vibration and other Chapters in the EIAR is primarily limited to Chapter 3 Population and Human Health and Chapter 10 Material Assets – Traffic. This Chapter has been prepared in consideration of and in conjunction with the relevant outputs of the Traffic and Transportation and Population and Human Health Chapters.

8.13 DIFFICULTIES ENCOUNTERED IN COMPILING

There were no difficulties encountered when compiling this assessment.

9.0 LANDSCAPE AND VISUAL

9.1 INTRODUCTION

This report provides an assessment of the visual impacts for a proposed residential development at, Ardee SHD, Co. Louth.

Stephen Diamond Associates Landscape Architects have been retained by the applicant to submit an assessment of the visual impact for the proposed Bridgeway, Rathgory & Mulladrillen Ardee SHD development, which is located in Ardee, Co. Louth.

Stephen Diamond Associates is a progressive design orientated landscape architecture consultancy based in Dublin. The office is a Registered Member of the Irish Landscape Institute (ILI), the professional organisation representing landscape architects in Ireland, and also holds full Membership of the Landscape Institute (CMLI), the professional organisation for chartered landscape architects in the UK.

The development site is located to the South of Ardee town centre which is situated along the N2.

The purpose of the study was to appraise the existing landscape of the development site and its environs, to assess the likely impacts arising from the proposed development and describe the proposed mitigation measures. The assessment was undertaken in May 2020 and involved a desk study review of drawings of the proposed scheme, local maps and aerial photographic mapping, historical and ecological research and field studies of the proposed scheme and its environs.

Site visits were undertaken in June 2020 to assess the existing landscape and pre-determined sensitive visual receptors impacted by the proposed development.

The visual impact assessment was prepared in accordance with the EPA's 'Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EIAR) (2017)' and 'Guidelines on Landscape and Visual Impact Assessment (2013)' prepared by the Landscape Institute and the Institute of Environmental Management & Assessment.

The visual impact assessment report identified and assessed likely significant impacts on the landscape within the study area.

Louth CDP 2021-2027 Policy Objective NBG 36 is *'To protect the unspoiled natural environment of the Areas of Outstanding Natural Beauty (AONB) from inappropriate development and reinforce their character, distinctiveness and sense of place, for the benefit and enjoyment of current and future generations'*. as identified in table 9.1.

Reference No.	Location
VP 58	Mulladrillen Hill and Mullaghash from the Town Centre
VP 59	Ardee Castle
VP 60	Castleguard Motte

Table 9.1 Views and prospects of Special Amenity Value in Ardee

9.2 STUDY METHODOLOGY

This assessment has been undertaken with regard to the vulnerability of the landscape to change and the location of visual receptors relative to the proposed development. The methodology is based on the EPA Guidelines.

Visual receptors refer to the general public and the visual amenities they enjoy, this essentially refers to views of or from within the landscape and the different groups of people, be they residents or tourists, who derive amenity from those views.

The two principal factors determining the visual impact of a development are the sensitivity of the location or receptor and the scale or magnitude of the proposed works. Therefore, '...the significance of visual effects will be assessed

by taking into consideration the sensitivity and importance of the receptor and the nature, scale or magnitude and duration of the change...’ at the site. When considering the impact of development or proposed development on an existing amenity, it is important to recognise that there is likely to be a continuum in the degree of visibility of the development from full view to no view.

9.2.1 Impacts

A proposed scheme can have an adverse, neutral or beneficial impact on the landscape and visual amenity of a particular area.

- Adverse impact, meaning a change that will detract from the landscape character as perceived from this viewpoint.
- Neutral impact, meaning a change that will neither enhance nor detract from the landscape character or viewpoint.
- Beneficial impact, meaning a change which will enhance the landscape character as perceived from this viewpoint.

The topic of landscape in the existing environment has two separate but closely related aspects; visual impacts and landscape character impacts. For the purposes of this report, we will be solely focusing on the visual impacts of the proposed development on the surrounding landscape. The landscape impact of the proposed development on the surrounding landscape has been assessed in a separate document titled ‘Landscape Report’ prepared by Stephen Diamond Associates.

9.2.2 Visual Impact

Visual Impact is the extent to which a new development or structure can be seen in the landscape.

‘Visual effects relate to the changes that arise in the composition of available views as a result of changes to the landscape, to people’s responses to the changes, and to the overall effects with respect to visual amenity. (The Landscape Institute with the Institute of Environmental Management & Assessment, 2002. Guidelines for Landscape and Visual Impact Assessment. London: Spon Press)

Visual impacts are characterised as ‘Visual Intrusion’ and ‘Visual Obstruction’, where:

- Visual intrusion is impact on a view without blocking; and
- Visual obstruction is impact on a view involving blocking thereof.

The visual impact of a proposed development is discussed using up to 6 categories of receptor type as listed below;

- Key Views - from features of national or international importance;
- Designated Scenic Routes and Views;
- Local Community views;
- Centres of Population;
- Major Routes; and
- Amenity, tourist and heritage features.

9.2.3 Key Views

These VRP’s (Visual Receptor Points) are at features or locations that are significant at the regional or national or even international level, typically in terms of heritage, recreation or tourism. They are locations that attract a significant number of viewers who are likely to be in a reflective or recreational frame of mind possibly increasing their appreciation of the landscape around them. This type of receptor is usually a point-specific feature.

9.2.4 Designated Scenic Routes and Views

Due to their identification in the County Development Plan this type of VRP location represents a general policy consensus on locations of high scenic value within the Study Area. These are commonly elevated, long distance, panoramic views and may or may not be mapped from precise locations. They are more likely to be experienced by static viewers who seek out or stop to take in such vistas.

9.2.5 Local Community Views

This type of VRP represents those people that live and/or work in the locality of the proposed development site, usually within a 5km radius of the site. Although the VRP's are generally located on local level roads they also represent similar views that may be available from adjacent houses. The precise location of this VRP type is not critical, however, clear elevated views are preferred, particularly when closely associated with a cluster of houses and representing their primary views. Coverage of a range of viewing angles using several VRP's is necessary in order to sample the spectrum of views that would be available from surrounding dwellings

9.2.6 Centres of Population

VRP's are selected at centres of population primarily due to the number of viewers that are likely to experience that view. The relevance of the settlement is based on the significance of its size in terms of the Study Area or its proximity to the site. The VRP may be selected from any location within the public domain that provides a clear view either within the settlement or in close proximity to it.

9.2.7 Major Routes

These include national and regional level roads and rail lines and are relevant VRP locations due to the number of viewers potentially impacted by the proposed development. The precise location of this category of VRP is not critical and might be chosen anywhere along the route that provides clear views towards the proposal site, but with a preference towards close and/or elevated views. Major routes typically provide views experienced whilst in motion and these may be fleeting and intermittent depending on screening by intervening vegetation or buildings.

9.2.8 Amenity Tourist and Heritage Features

These views are often one and the same given that heritage locations are often important tourist and visitor destinations and amenity areas or walking routes are commonly designed to incorporate heritage features. Such locations or routes tend to be sensitive to development within the landscape as viewers are likely to be in a receptive frame of mind with respect to the landscape around them. The sensitivity of this type of visual receptor is strongly related to the number of visitors they might attract and, in the case of heritage features, whether these are discerning experts or lay tourists. Sensitivity is also heavily influenced by the experience of the viewer at a heritage site as distinct from simply the view of it. This is a complex phenomenon that is likely to be different for every site.

Experiential considerations might relate to the sequential approach to a castle from the car park or the view from a hilltop monument reached after a demanding climb. It might also relate to the influence of contemporary features within a key view and whether these detract from a sense of past times. It must also be noted that the sensitivity rating attributed to a heritage feature for the purposes of a landscape and visual assessment is not synonymous with its importance to the Archaeological or Architectural Heritage record.

9.2.9 Landscape Sensitivity

Landscapes evolve and change over time, and are affected to degrees by new developments. In order to control sustainable development and to avoid undesirable visual impacts and effects on the landscape, community and receiving environment in general, it is important to establish the extent of the landscape visually affected by any proposed development, and assess the ability of the landscape to absorb change.

The capacity of an area to absorb development in a visual fashion is influenced by a combination of three factors:

- Topography: areas where enclosing topography, screening vegetation and/or existing development are present have a high potential to absorb new development. Development in elevated areas or on ridgelines will usually be visible over a wide area, development in enclosed areas will not.
- Vegetation: areas which have (or have the potential to accommodate) vegetation such as trees, tall hedges and woods or copses, can screen new development from view. Areas which cannot support vegetation are unlikely to be able to screen new developments.
- Development: new development is less likely to be conspicuous where there is a context of existing development in the landscape.

9.2.10 Significance Assessment

The significance criteria used for the landscape and visual impact assessments are based on the impact levels suggested in the EPA 'Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EIAR)' - 'EPA Impact Significance Categories (Multidisciplinary)' as follows:

The extent of Visual Effects.

- Imperceptible Effects: There are no changes to views in the visual landscape;
- Not Significant: An effect which causes noticeable changes in the character of the visual environment but without noticeable consequences. The proposal is adequately screened due to the existing landform, vegetation or constructed features.
- Slight Effects: An effect which causes noticeable changes in the character of the visual environment without affecting its sensitivities. The affected view forms only a small element in the overall visual composition, or changes the view in a marginal manner.
- Moderate Effects: An effect that alters the character of the visual environment in a manner that is consistent with existing and emerging trends. The proposal affects an appreciable segment of the overall visual composition, or there is an intrusion in the foreground of a view.
- Significant Effect: An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the visual environment. The proposal affects a large proportion of the overall visual composition, or views are so affected that they form a new element in the physical landscape.
- Very Significant Effects: An effect which, by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the visual environment. The proposal affects the majority of the overall visual composition, or views are so affected that they form a new element in the physical landscape
- Profound Effects: An effect which obliterates sensitive characteristics. The view is entirely altered, obscured or affected

Impacts may be rated as adverse, neutral or beneficial and be of a temporary; short-term; medium-term; long-term or permanent nature as described in the EPA Guidelines. The magnitude of such landscape impacts may be rated under the following table:

Scale/Magnitude of Impact	Description
Very High	Change that would be large in extent and scale with the loss of defining landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an overall change of the landscape in terms of character, value and quality.
High	Change that would be more limited in extent and scale with the loss of significant landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an overall change of the landscape in terms of character, value and quality.
Medium	Changes that are modest in extent and scale involving the loss of landscape characteristics or elements that may also involve the introduction of new uncharacteristic elements or features that would lead to changes in landscape character, and quality.
Low	Changes affecting small areas of landscape character, together with the loss of some less characteristic landscape elements or the addition of new features or elements.
Negligible	Changes affecting small or very restricted areas of landscape character. This may include the limited loss of some elements or the addition of some new features or elements that are characteristic of the existing landscape or are hardly perceivable.
Nil	No change to areas of landscape character possible from the VPR.

Table 9.2: Magnitude of landscape impacts

Scale/Magnitude	Sensitivity of Receptor				
	Very High	High	Medium	Low	Negligible
Very High	Profound	Profound-significant	Significant	Moderate	Slight
High	Profound-significant	Significant	Significant-moderate	Moderate-slight	Slight-imperceptible
Medium	Significant	Significant-moderate	Moderate	Slight	Imperceptible
Low	Moderate	Moderate-slight	Slight	Slight-imperceptible	Imperceptible
Negligible	Slight	Slight-imperceptible	Imperceptible	Imperceptible	Imperceptible

Table 9.3: Landscape impact significance matrix

9.2.11 Duration of Impact

Duration of impact, which may be negative, neutral or positive, is considered as being either:

- Temporary (lasting 1 year or less)
- Short term (lasting 1 to 7 years)
- Medium Term (lasting 7 to 15 years)
- Long Term (lasting 15 to 60 years)
- Permanent (lasting in excess of 60 years)

In reporting on visual impact, the impact of the proposed development was assessed at three stages:

1. Construction Stage: impact arising during the period of initial site setup works up to the opening of the proposed development
2. Early Operation Stage: impact arising during the initial operation of the development prior to the maturity of the proposed landscaping as an effective mitigation. The impact is assessed in the winter of the year the scheme will open, when planting mitigation measures are least effective.
3. Established Operation Stage: impact arising in the medium to longer term is assessed in the fifteenth year after scheme opening at which stage the proposed tree and shrub planting will have developed as effective mitigation as required.

9.2.12 Planning Designations in the vicinity of the Development Site

The site is located within a specific Landscape Character Area as designated at Chapter 8 Section 8.10 of the Louth CDP 2021-2027.

9 no. Landscape Character Areas were identified in the County Development plan. These represent geographical areas with a particular landscape type or types, and are listed in Table 5.5 and identified on Map 5.5.

Landscape Character Areas	Importance
• Carlingford Lough and Mountains incl. West Feede Uplands	International
• Boyne & Mattock Valley	National
• Dundalk Bay Coast • Dunany to Boyne Estuary Coast • Uplands of Collon and Monasterboice	Regional
• Cooley Lowlands and Coastal Area • Lower Faughart, Castletown and Flurry River basin • Louth Drumlin and Lake Areas • Muirhevna Plain	Local

Table 9.4 Louth CDP 2021-2027

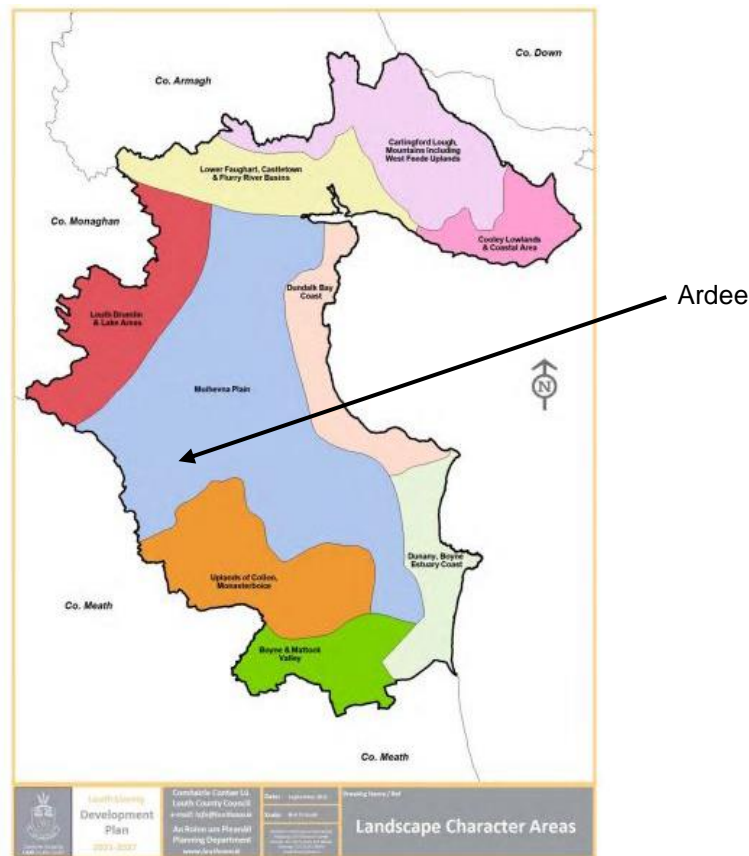


Figure 9.1 Louth CDP 2021-2027

Policies within the Louth County Development Plan 2021-2027 include:

HER 10 *To afford protection to the landscapes and natural environments of the County, by permitting only those forms of development that are considered sustainable and do not unduly damage or take from the character of the landscape or natural environment.*

HER 12 *To consider the designation of Landscape Conservation Areas to protect specific important landscapes.*

Planning designations which have landscape implications within the vicinity of the Development Site are listed below:

- Louth County Development Plan 2021 - 2027

The site is currently zoned in the Louth County Development as A2 New Residential Phase 1. A requirement is also “to provide for residential development subject to the provision of a public park containing a minimum of 12 acres”

9.2.13 Protected Structures

The site does not fall within the ‘Ardee Conservation Area’ within the Louth County Development Plan 2021-2027. An Area of Architectural Conservation “is a place, area, group of structures or townscape of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest, or which contribute to the appreciation of protected structures” under the terms of the Planning and Development Act 2000 (as amended).

9.2.14 Protected Natural Heritage Sites

The Development site is not adjacent to any protected structures of Ardee town centre.

9.2.15 Views and Prospects

Views and prospects, relative to the zone of influence of the development site, are identified on Figure 9.4, map showing location of receptor points in this document.

The Louth County Development Plan 2021-2027 includes objectives to protect views of Mulladrillen Hill, Castleguard and Ardee Castle and the retention of natural amenity features including trees and woodlands of special amenity value, hedgerows and streams.

The design and layout of the development has ensured that the protected view of Mulladrillen Hill will not be impacted from the development. A public park is proposed to the area nearest to Mulladrillen Hill. This will compliment this protected view.

9.2.16 Conservation Areas and Action Plans

There is an 'Architectural Conservation Area' situated within the centre of Ardee along main street and town centre however it does not cover any part of the proposed development site.

Objectives within Louth County Development Plan 2021-2027 include:

NBG 1 "To promote the implementation of the draft Louth Heritage Plan 2021-2026 and any subsequent Louth Heritage Plan endorsed during the life of this Plan."

NBG 3 "To protect and conserve Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) designated under the EU Habitats and Birds Directives."

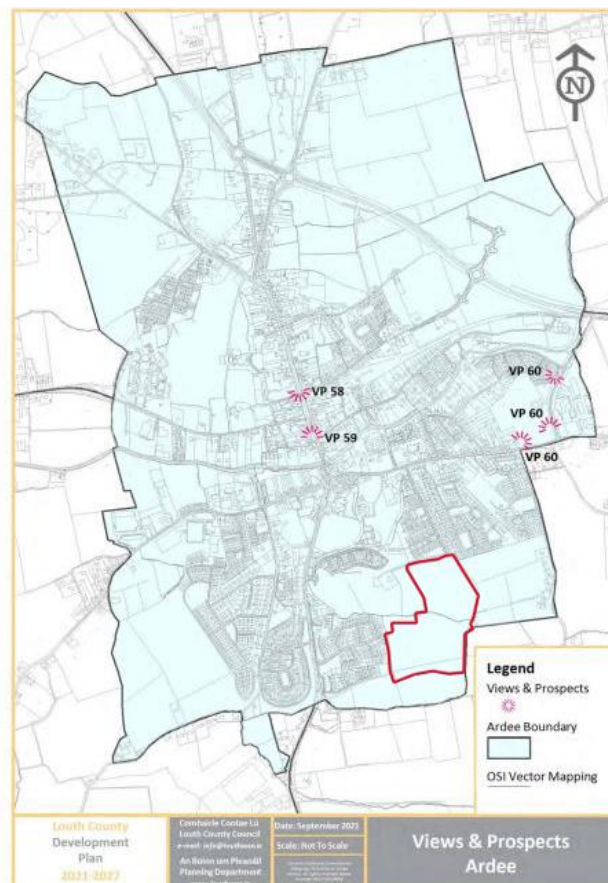


Figure 9.2: Section taken from Louth County Development plan 2021-2027 showing protected views and structures surrounding the site (indicative site location outlined in red)

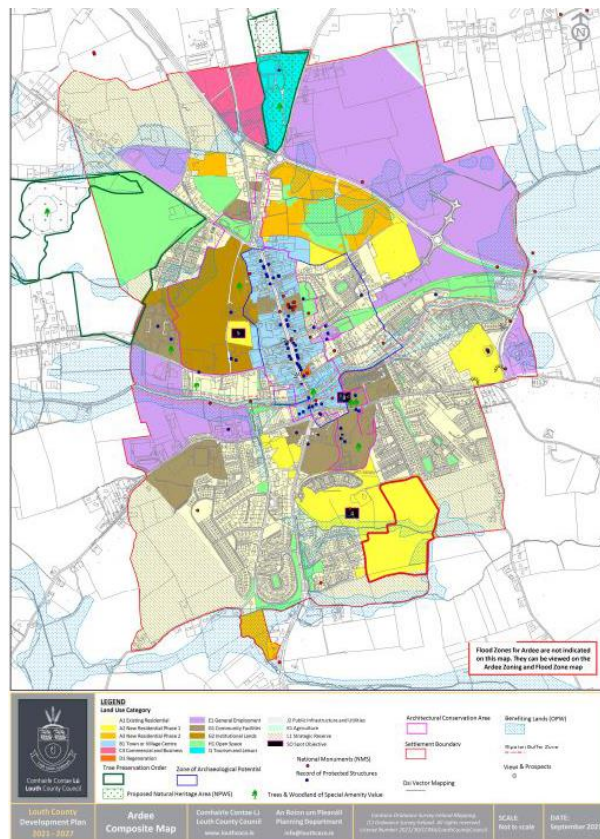


Figure 9.3: Section taken from Louth County Development plan 2021-2027 showing land zoning. The site is located within the large yellow section south of Ardee town centre (indicative site location outlined in red)

9.3 THE EXISTING RECEIVING ENVIRONMENT (BASELINE SITUATION)

The EPA Guidelines advise that a description of the existing environment is an essential part of a visual impact assessment, in that it provides an accurate description of the relevant aspects of the existing environment, which can be used as a reference point, or ‘baseline’ against which the impact of the development upon the environment can be assessed.

The context gives a description of the existing environmental features which make up the landscape. It also indicates the extent of visibility, or primary zone of visual influence relative to the development. The character of the landscape is identified and described in terms of the natural and human features, which create distinctive areas within the landscape.

9.3.2 General Site Setting

The development site is located c. 1km south of Ardee town centre. The site is currently zoned in the Louth CDP 2021-2027 as A2 New Residential Phase 1.

The site is adjacent to housing developments to the west and north. This includes the Bridgeway developments Phases 1-3 (currently under construction). To the east is further land zoned as for future residential development. There is an existing stream that cuts through the site with native planting.

9.3.3 Existing Vegetation

The existing vegetation to the western boundary comprises of Ash trees (*Fraxinus Excelsior*) native hedgerows including Common Hawthorn (*Crataegus monogyna*), Common Ivy (*Hedera Helix*), (Blackberry/Bramble) *Rubus fruticosus* & *Sambucus nigra* (Elder).

There are further native hedgerows to the northern boundary along with a Whitebeam (*Sorbus aria*) & *Prunus cerasifera* ‘Nigra’ (Purple Cherry Plum).

The eastern boundary has further native hedgerows along with Ash trees (*Fraxinus Excelsior*) and White Willow (*Salix Alba*). The stream that cuts through the site consists of native hedgerows including Common Hawthorn (*Crataegus monogyna*), Common Ivy (*Hedera Helix*), (Blackberry/Bramble) *Rubus fruticosus s.*, *Sambucus nigra* (Elder) & Goat Willow/Great Sallow (*Salix caprea*).

9.3.4 Landform

The existing stream is the lowest point of the site with the land rising to the north towards the water tower and south. There is approximately 10 meters in level difference between the lowest point of the site and the highest point.

9.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development will consist of the construction of 272 no. residential units comprising a mix of 206 no. 2, 3 and 4 bedroom houses (2 and 3 storeys) and 66 no. 1, 2 and 3 bedroom duplex units (3 storeys).

An internal street and roads network has been developed in accordance with best practice DMURS principals. There is a clear hierarchy of local streets in the form of home zones. There are 2 no. neighbourhood streets which are local street links.

These neighbourhood streets will provide their own distinctive character separate from external circulation. The proposed development will facilitate a future link, subject to agreement with adjoining owners, with the existing Cherrybrook residential development to allow connectivity between the neighbourhoods.

The landscape plan for the proposed residential development utilises a simple but effective palette of naturalised native and ornamental species which are chosen for their visual qualities, ease of establishment and their capacity to provide habitats.

Perennial mixes in particular are one area where a multitude of species can be specified. These linear landscape elements should be viewed as green corridors - in essence they are biodiversity links which provide connections to separate habitats. With this concept to the fore, a mix of perennials and single species have been chosen.

9.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

The potential impacts the proposed development has been assessed by describing certain viewpoints within its zone of visual influence, and assessing the impacts which the development will have upon these viewpoints. A Visual Impact Assessment has been undertaken for each viewpoint to assess impacts such as changes in character and visibility, consequences of change; potential for interaction with other impacts and worst-case scenario for the landscape if all mitigation measures fail.

The term 'receptor' is used in landscape and visual impact assessments to mean an element or assemblage of elements that will be affected, directly or indirectly, by the proposed development. Landscape receptors include elements of the physical landscape such as topographic, geological and drainage features; woodland, tree and hedgerow cover; land use; field boundaries and artefacts, etc. Visual receptors include the public or community at large, residents, visitors and other groups of viewers as well as the visual amenity of the people effected.

All developments have some degree of landscape and visual impact and this impact is influenced by the degree and significance of change in any given location. Such impact tends to be more pronounced during the construction phase when the initial unfamiliarity, disturbance and visual intrusion associated with general construction activity and development of new structures are all aspects of particular visual attention.

On completion of construction, the general disturbance and the initial change associated with the scheme eases as the new development establishes its own presence and characteristic influence on its environs. However, the nature and degree of impact can also change following construction.

9.6 POTENTIAL CUMULATIVE IMPACTS

The approach used to determine cumulative effects has drawn on guidance on cumulative impact assessment published by the GLVIA3. Cumulative landscape and visual effects may result from additional changes to the

baseline townscape or views as a result of the Proposed Development in conjunction with other developments of a similar type and scale.

The cumulative assessment includes developments that are consented but not constructed, that are the subject of undetermined applications, or are currently at scoping which are similar in type and scale to the Proposed Development.

The currently permitted developments in the vicinity have also been reviewed as potential cumulative impacts. These include the parent permission at Phase 1-3 of Bridgegate (permitted under Louth County Council Reg. Ref.: 10174; ABP Ref: PL15.238053 amended under permissions Reg. Refs.: 19336, 19353, 19549, 19875 and 211475) (under construction to the west) consisting of 155 no. dwellings.

The proposed development, in combination with the permitted scheme at Phases 1-3 at Bridgegate, will provide a significant element of public infrastructure in the form of a c. 7.2 ha public park, of which c. 3.6 ha will be located within the subject site.

9.6.1 Cumulative Landscape and Visual Effects

Cumulative landscape and visual effects may result from additional changes to the baseline landscape / townscape or views as a result of the Proposed Development being seen in conjunction with other developments similar in scale, type and nature. Below is a list of cumulative schemes that have planning consent or are currently in the planning process. Developments under construction are considered to be part of the landscape and visual baseline.

Planning Reference	Proposal	Status	Location in relation to proposed development	Relevance to this assessment
ABP REF: PL15.238053 (AS AMENDED)	Permission for a 10-year permission for a development consisting of (i) a public park (4.91ha) including play areas & a MUGA (Multi Use Games Area), (ii) a total of 281 residential dwellings (14 no. apartments, 34 no. duplex type dwellings, 83 no. terrace dwellings, 72 no. semi-detached dwellings, 78 no. detached dwellings)	Conditional	West of the proposed development site	Relevant – Under Construction

Cumulative Effects Phase 1-3 of Bridgegate (permitted under Louth County Council ABP Ref: PL15.238053)

The granted housing development currently under construction is land zoned for residential development as it is strategically placed within close proximity to Ardee town centre. Should this scheme be completed they will serve to realise ambitions and aspirations for these lands set out in Louth County Development Plan 2021-2027. Considering the existing topography, adjacent developments and mature tree vegetation, combined views of both developments will likely be limited to distant elevated locations from the west (Cherrybrook/Moorhall Cl). Both developments together herald the emergence of a new suburban context south of Ardee town centre. The magnitude of cumulative effects is considered medium, and significance considered slight neutral as the visibility of both developments will increase the prevalence of suburban development & character in available views. The proposed development continues the scale of developments adjacent to the site and they are in keeping with the character of existing developments.

9.6.2 Construction Phase: Visual Impacts

During the construction phase, the proposal will have a short-term (lasting approximately 7 years) slight negative impact on the site setting relating to:

- The delivery of construction materials to the site causing a short-term increase in traffic volume
- construction debris and dust
- visual impacts caused by site requirements such as cranes, hoists, lifting equipment, site hoardings and scaffolding.

From a visual impact point of view, the main impacts during construction are:

- Earth moving operations. Some earth moving operations will take place during the construction phase of the development,
- Construction traffic (primarily delivery trucks). However, the construction traffic will be transient, and the visual impact will be low. Construction workers' cars and vans used to get to and from work can have an adverse visual impact if parked on adjacent roads. A construction management plan will be put in place with appropriate car parking solutions. Consequently, the impact will have no more significance than parking on the completed and operational development.

9.6.3 Operational Stage: Visual Impacts

Two assessments of visual impacts are made, using different assumptions. The first considers the impact on a winter's day in the year after the development scheme opens, i.e., prior to the establishment of mitigation planting. The second considers the developments impact in the winter of the fifteenth year after the opening of the development and will take account of all proposed planting.

The Landscape and Visual Impact assessment at section no 9.9 individually describes each of the impacts on each of receptors in detail, these include:

- Lists the distance from the visual receptor viewpoint to the nearest part of the development site,
- Describes the extent of views possible from each area and then sets out the degree of unmitigated and mitigated visual impact.
- Finally, the assessment summarises the significance of the visual impact and whether it is neutral, negative or positive.
- For a detailed location of all of the following receptor points please refer to figure 3 in this chapter.

9.7 'DO NOTHING' IMPACT

Objective 4 of Louth County Development plan 2021-2027 is relevant to the proposed site and requires *"To provide a public park with a minimum area of 12 acres (4.9 hectares) as part of a residential development."*, which means that if the proposed development does not proceed, the park will not be delivered in full.

An alternative that the 'Do Nothing Scenario' includes retention of the current site without the proposed development in place and that the visual impacts will remain as per the baseline and will change with trends within the surrounding area including influences from potential new developments in the surrounding area.

9.8 AVOIDANCE, REMEDIAL & MITIGATION MEASURES

Mitigation measures aim to avoid, reduce, and remedy or offset negative or adverse effects on the environment caused by the proposed development. The residual impact of the development is intended to describe the final intended impact of the mitigation measures, post-establishment.

9.8.1 Construction Phase

The mitigation measures applied to the development scheme have been designed as an integral part of the project design.

- The remedial measures proposed revolve around the implementation of appropriate site management procedures – such as the control of site lighting, storage of materials, placement of compounds, delivery of

materials, car parking, etc. Visual impact during the construction phase will be mitigated somewhat through appropriate site management measures and work practices to ensure the site is kept tidy, dust is kept to a minimum, and that public areas are kept free from building material and site rubbish.

- Site hoarding will be appropriately scaled, finished and maintained for the period of construction of each section of the works as appropriate. To reduce the potential negative impacts during the construction phase, good site management and housekeeping practices will be adhered to. The visual impact of the site compound and scaffolding visible during the construction phase are of a temporary nature only and therefore require no remedial action.
- A number of existing trees and hedgerows are to be retained and these are shown in the Arboricultural Report and associated drawings prepared by Charles McCorkell. Existing trees to be retained are particularly sensitive to negative impacts during the construction phase if proper protection measures are not adhered to. With regard to the protection of the retained trees on site during proposed construction works, reference should be made to BS5837: Trees in relation Design, Demolition and Construction – Recommendations (BSI, 2012). Tree protection details (from Charles McCorkell Arborist) are included with the application.

9.8.2 Operational Phase

Mitigation measures are employed to provide a coherent sense of place, or *genus loci*, by providing a clear and legible design for the parts of the proposal, inspired by the site setting and characteristics.

- The visibility of the proposed development will be mitigated to varying degrees by screen planting of native trees and hedgerows to the site boundaries, entrance and car-parking areas. In time the maturity of this planting will act to visually absorb and soften the built environment and will become an asset in itself. The planting will also act to reduce air and noise pollution.
- Predominantly native tree planting has been used, this will increase biodiversity and provide green corridors along which wildlife can move between habitats, the development therefore becomes a vital link in the green infrastructure of the town.
- The landscape design is specified to provide for a low maintenance regime by the selection of progressive naturalistic systems and native/naturalised species.
- Many of the trees specified as part of the landscape plan will be planted as semi-matures, ensuring that a strong degree of shelter, maturity and an increased feeling of permanence can be established quickly. The species have been specifically selected to provide seasonal interest and variety through their shape, flower and form.
- Trees and shrubs will also be used in conjunction with the hard landscape to create interesting, enticing and attractive spaces for the public to visit. The strategic placement of elements such as seating, paths and attractive planting schemes will ensure an enjoyable pedestrian experience.

Native naturalised and ornamental tree, shrub and hedgerow species have been specified both around the perimeter and within the external spaces of the project facilities. This performs a screening function which will help to settle the development within the receiving environment.

- A lower, attractive planting of ornamental flowering shrubs and perennials will be provided. This in tandem with native tree and hedgerow species will provide food sources and habitats for wildlife, be they mammals, birds or invertebrates.
- The specification of planting as described contributes to the expansion of green infrastructure within the town, which is a stated aim of green infrastructure policy in Louth County Development Plan 2021-2027. The development would also assist in the realisation of enhancing the general level of tree cover in the town which is also mentioned in the document & to also reduce the impact of new structures on the existing town.

The proposed planting will generally be established in line with normal landscape planting techniques, i.e., '*bare-root transplants*', '*whips*', '*feathered trees*', root-balled '*semi-mature standard trees*' and container grown '*ornamental shrubs*'. The proposed planting will be subject to an agreed maintenance and management plan. Please refer to the '*Landscape Plan + Planting Schedule*' drawings no. 20-547-SDA-PD-DR-001 submitted by Stephen Diamond Associates for full landscape details.

The implementation of the public park, linear park & riparian corridor and other various open spaces through the site will enhance the landscape the visual qualities of the overall landscape.

The Hill Park will also provide a valuable public amenity to the settlement and local community.

9.8.3 Worst Case Scenario

Landscape and visual impact mitigation measures relate to the provision of an improved visual, landscape and ecological situation through the extensive landscaping measures provided as part of the proposed development. The worst-case impact is intended to assess what might happen if the proposed landscape mitigation measures including planting fail.

Quality topsoil will be imported as required to provide a planting medium to the mitigation planting and landscape planting, which will be provided with drainage where required, so it is considered unlikely that these measures would fail. The development of a maintenance plan for the hard and soft landscaped features of the development will reduce the likelihood of failure.

9.8.4 Landscape Impact Assessment

The major landscape impacts will be the removal of existing trees to facilitate the development & the re-alignment of the existing watercourse running east west through the site and also the groundworks required to achieve part M compliant footpaths throughout the site.

A total of 7 trees and 7 hedgerows have been proposed for removal. The impact of the removal of these trees have been supplemented with semi mature tree planting to achieve a sense of maturity immediately within the development. A mix of native trees have been proposed inspired by the species of tree currently found on the site, and suitability of the tree to the location.

The subject site is a rolling landscape with the stream running east west being the lowest point and it rising towards De la salle crescent neighbourhood to the north of the site towards Ardee town centre.

The site is immediate adjacent to De la salle crescent and Moorehill rise residential neighbourhoods to the north with further residential land to the west of the site (Cherrybrook Close).

There will be a significant alteration to the character of site at the site location. The largest change will be the transformation of a previously greenfield open space into a largely built-up area with a suburban character. It should be noted that while some trees require removal to facilitate the development the existing watercourse and riparian woodland will be preserved as much as possible while accommodating the new infrastructure required for the development.

The riparian corridor along the realigned watercourse will be further supplemented with a mix of semi mature trees inspired by the species currently on site. The watercourse and historic hedgerow will form an integral part to the future character, identity and placemaking of the site.

The magnitude of landscape change is considered moderate; An effect that alters the character of the landscape in a manner that is consistent with existing and emerging trends. There are minor changes over some of the area (up to 30%) or moderate changes in a localised area.

The resulting landscape significance is moderate neutral. Neutral meaning it neither detracts from nor enhances the landscape of the receiving environment or view.

9.9 VISUAL IMPACT ASSESSMENT

The initial step in this assessment was an in-depth review of the current landscape and visual resources within the vicinity of the proposed development site.

Elements such as existing landscape features, landscape characteristics, the way in which the landscape is perceived and experienced, and the value placed on the surrounding landscape and visual resources in the area, all formed a base-line study from which to work off and identify the impact of such a development.

From here, the visual analysis study was undertaken. This involved the selection of a number of key receptor points within this area that may be susceptible to influence by the development.

The range of points is important in order to provide a consistent, credible and effective visual assessment. This meant the selection of points of varying distances from the site to represent near, middle- and long-distance views. The specific selection of both private and public viewpoints was also vital. Finally, the selection of sensitive receptor points in more delicate landscapes such as points directly bordering the site or points of importance. A magnitude of change was also established, in other words, how much of the view from the receptor points in question would be affected.

Through on-site and desktop analysis the extent of the sensitivity of receptors and the magnitude of the impact on that receptor point was established. These findings have been discussed in greater detail under each individual receptor point. Following on site and desktop analysis Table 9.5 outlines the scale, magnitude and significance of each receptor point.



Figure 9.4: Map showing location of receptor points

View Locations & Zone of Visual Influence - Views 1-9

For a detailed location of all of the following receptor and corresponding viewpoints, please refer to figure 9.4. For details of mitigation planting and proposed landscape design, please refer to drawings no. 20-547-SDA-PD-DR-001 prepared by Stephen Diamond Associates which accompany this application.

9.9.1 Viewpoint 1: View from East of site facing west

This view is taken mid-way beyond the eastern boundary of the site. The view is approximately 300 metres from the nearest point of the site.

9.9.1.1 V1 Existing View Sensitivity - Medium

The foreground of the view consists of a driveway entrance. The proposed site cannot be seen due to the vegetation in the middle foreground. The right middle ground & background has a hedgerow adjacent to the road.



Above: Existing View

9.9.1.2 V1 Operational View

In operational view the proposed development is largely hidden by a wooden fence and dense vegetation in the middle background and to the hedgerow along the road.



Above: Operational View

Conclusion

In conclusion the impact from this viewpoint receptor is considered imperceptible. From this viewpoint the development will not have any impact on the surrounding landscape. The scale/ magnitude of the development has been categorised as imperceptible.

9.9.2 Viewpoint 2: Beyond Eastern boundary of site facing west

This view is taken from the farmyard beyond the eastern boundary of the site which is the nearest public road.

9.9.2.1 V2 Existing View Sensitivity - Low

The foreground consists of grassland and hedgerows dividing up the fields in the distance. There is very little to be seen in the background with a flat landscape for some distance.



Above: Existing View

9.9.2.2 V2 Operational View

In operational view part of the development is hidden in the middle ground due to the landform of the landscape from this view. The housing to the right middle ground is hidden behind the rise in ground level near the water tower. Some of the proposed housing can be seen in the middle ground but it does not have significant impact on the views from this receptor.



Above: Operational View

Conclusion

The proposed development forms a small element in a wider panorama. The scale/ magnitude of the development has been categorised as 'low'. In conclusion, the impact from this viewpoint receptor is considered slight/ imperceptible.

9.9.3 Viewpoint 3: South west of site along N2 road facing North-east

This view is taken from the N2 road south of the Lidl supermarket entering Ardee town, facing north-east. The viewpoint is approximately 400 metres from the nearest point of the site.

9.9.3.1 V3 Existing View Sensitivity - Medium

The foreground of this view is taken up by the vegetation along the N2 road into Ardee town and the house to the right. The lie of the land drops towards the site. Mature vegetation blocks any potential views of the proposed development site.



Above: Existing View

9.9.3.2 V3 Operational View

The development cannot be seen from this viewpoint and completely hidden due to the rise and fall in the land towards the site.



Above: Proposed View

Conclusion

The scale/ magnitude of the development has been categorised as 'negligible'. In conclusion the impact from this viewpoint receptor is considered imperceptible.

9.9.4 Viewpoint 4: Moorehall close facing east South-west

This view is taken from Moorehall close within the Cherrybrook estate facing east towards the existing stream and water-tower. The viewpoint is directly adjacent to the proposed development.

9.9.4.1 V4 Existing View Sensitivity - Medium

The foreground is mainly composed of the road of Cherrybrook estate and existing houses and boundary walls. The middle of the view consists of timber fencing and hedgerow that separates Cherrybrook from the subject site.



Above: Existing View

9.9.4.2 V4 Operational View

In operational view the proposed housing is in keeping with the existing building heights and continues the pallet of existing materials. With the medium sensitivity of receptor and medium scale/magnitude of impact the significance of visual impact has been assessed as moderate, appropriate to the emerging trend of development in the area.



Above: Proposed View

Conclusion

The scale/ magnitude of the development has been categorised as '*medium*'. In conclusion the permanent impact from this viewpoint receptor is considered moderate.

9.9.5 Viewpoint 5: Drogheda road south of Ardee town centre facing east

This view is taken from the N2 road further towards the centre of Ardee town centre facing east towards the site entrance.

9.9.5.1 V5 Existing View Sensitivity - Medium

The foreground is occupied mostly by the entrance to the phase 1 development of the site. The middle ground consists of the rising land towards the water tower and vegetation to the right middle ground.



Above: Existing View

9.9.5.2 V5 Operational View

The proposed development as we can see from the red outline of the building in operational view will not be seen from this receptor and will be hidden behind the landform rising towards the water tower.



Above: Proposed View

Conclusion

The scale/ magnitude of the development has been categorised as 'negligible'. In conclusion the impact from this viewpoint receptor is considered 'imperceptible' to areas visible from this receptor.

9.9.6 Viewpoint 6: Hale Street (De la salle estate) facing South

This view is taken from the southern end of Hale Street within De la salle crescent housing estate facing south.

9.9.6.1 V6 Existing View Sensitivity - Medium

The foreground is occupied mostly by the estate road and housing, driveways. The middle ground consists of mature vegetation to the southern boundary of De la salle estate.



Above: Existing View

9.9.6.2 V6 Operational View

From this viewpoint the development will have no impact on this receptor. The rising ground level hides the development settling it into its surrounding landscape.



Above: Proposed View

Conclusion

The scale/ magnitude of the development has been categorised as 'negligible'. In conclusion the impact from this viewpoint receptor is considered imperceptible to areas visible from this receptor.

9.9.7 Viewpoint 7: Clonmore facing South-west

This view is taken from Clonmore at the northeastern side of the site facing south-west. The view is taken approximately 300 meters from the nearest point of the site.

9.9.7.1 V7 Existing View Sensitivity - Medium

The foreground is occupied mostly by grassland followed by dense vegetation to the hedgerows dividing the site from its adjacent land. The skyline operates the background of the view. There is a single dwelling to the left middle ground.



Above: Existing View

9.9.7.2 V7 Operational View

The development will have no change on the surrounding landscape from this viewpoint as it is again largely hidden behind the rising ground level relative to the site ground level.



Above: Proposed View

Conclusion

The scale/ magnitude of the development has been categorised as 'negligible'. In conclusion the impact from this viewpoint receptor is considered imperceptible to areas visible from this receptor.

9.9.8 Viewpoint 8: Kildemock facing North-West

This view is taken from the Kildemock townland facing north-west. The view is taken approximately 500 meters from the nearest point of the site

9.9.8.1 V8 Existing View Sensitivity - Low

The foreground is occupied mostly by vegetation and grassland. The middle ground is occupied mature vegetation & hedgerows. The background is taken up by some high vegetation and the skyline.



Above: Existing View

9.9.8.2 V8 Operational View

The development sits just below the horizon from this receptor. During Spring when this photo was taken it is screened largely by the mature vegetation to the hedgerows. In winter the development might be clearer along the skyline. Given it is a considerable distance from the proposed site it is unlikely that the impact will change significantly between seasons.



Above: Proposed View

Conclusion

The scale/ magnitude of the development has been categorised as 'negligible'. In conclusion the impact from this viewpoint receptor is considered imperceptible to areas visible from this receptor.

9.9.9 Viewpoint 9: East of site facing West

This view is taken from the east of the site facing west. The view is approximately 1km from the nearest point of the site.

9.9.9.1 V9 Existing View Sensitivity - Low

The foreground is occupied mostly by grassland with the middleground taken up by dense mature vegetation. The background consists of the skyline.



Above: Existing View

9.9.9.2 V9 Operational View

The development will not be seen from this receptor as can be seen by the red outline to the development.



Above: Proposed View

Conclusion

The scale/ magnitude of the development has been categorised as ‘negligible’. In conclusion the impact from this viewpoint receptor is considered imperceptible to areas visible from this receptor.

VRP	View	Protected View	Receptor	Sensitivity of Receptor	Landscape Value & Sensitivity ¹⁵	Landscape Sensitivity ¹⁵	Landscape Impact Significance	Visual Impact Significance	Scale/ Magnitude of Impact	Construction Stage Impact (1 Year of Less)	Early Operation Stage Impact (1-7 years)	Established Operation Stage Impact (15 years +)	Duration of Impact
													Rating
V1	View from East of site facing west	No	Users of Public Roads/ Footpaths	Medium	Low Value	Low	Nil/ No change	Nil/ no change	imperceptible	imperceptible	imperceptible	imperceptible	Permanent
	300m												Neutral
V2	Beyond Eastern boundary of site facing west	No	Users of Public Roads/ Footpaths	Low	Low Value	Low	Slight/ Imperceptible	Slight/ Imperceptible	Low	Low	Low	Low	Permanent
	400m												Neutral
V3	South west of site along N2 road facing North-east	No	Users of Public Roads/ Footpaths	Medium	Low Value	Low	Nil/ No change	Nil/ No change	imperceptible	imperceptible	imperceptible	imperceptible	Permanent
	400m												Neutral
V4	Moorehall close facing east South-west	No	Users of Public Roads/ Footpaths	Medium	Low Value	Low	Moderate	Moderate	Medium	Medium	Medium	Medium	Permanent
	40m												Neutral
V5	Drogheda road south of Ardee town centre facing east	No	Users of Public Roads/ Footpaths	Medium	Low Value	Low	Nil/ No change	Nil/ No change	imperceptible	imperceptible	imperceptible	imperceptible	Permanent
	300m												Neutral
V6	Hale street (De la salle estate) facing South	No	Users of Public Roads/ Footpaths	Medium	Low Value	Low	Nil/ No change	Nil/ No change	imperceptible	imperceptible	imperceptible	imperceptible	Neutral
	40m												Neutral
V7	Clonmore facing South-west	No	Users of Public Roads/ Footpaths	Medium	Low Value	Low	Nil/ No change	Nil/ No change	imperceptible	imperceptible	imperceptible	imperceptible	Permanent
	300m												Neutral
V8	Kildemock facing North-West	No	Users of Public Roads/ Footpaths	Low	Low Value	Low	Nil/ No change	Nil/ No change	imperceptible	imperceptible	imperceptible	imperceptible	Permanent
	500m												Neutral
V9	East of site facing West	No	Users of Public Roads/ Footpaths	Low	Low Value	Low	Nil/ No change	Nil/ No change	imperceptible	imperceptible	imperceptible	imperceptible	Permanent
	1km												Neutral

Table 9.5: Landscape & Visual Impact on Viewpoints

9.10 MONITORING

A detailed maintenance plan will be agreed with a landscape contractor so that an attractive landscape setting is created and maintained for the occupiers and general public. A management and maintenance plan for this development would need to be focused by the original design intent of the landscape proposal.

This development has a significant public aspect with important landscape qualities and opportunities. Planned management and maintenance strategies will be put in place for both 'soft' planted and 'hard' paved spaces, which may need to change over time as the planting matures and the needs of the development evolve.

This plan will cover hard landscaped areas; special design features; planting establishment periods; ornamental shrub areas; hedges and mass planting; grass and herb layers and trees.

Annual checks on the establishment and general health of all planting will be carried out for a period of one year post completion. Any grass lawns, tree or shrub planting that fails to establish successfully within the first year after planting is to be replaced to meet planning specification requirements and reviewed as part of the ongoing maintenance requirements until successfully established.

A landscape architect will be appointed to design and supervise the implementation of the landscape works.

9.11 REINSTATEMENT

There will be no areas of ground left to reinstate as the development building, access roads, car parks, open space hard and soft landscaping covers the entirety of the site. All temporary construction areas and compounds will be removed and finished to the specification detailed in the landscape scheme.

9.12 INTERACTIONS

The main interactions that relate to landscape are with biodiversity, water (particularly SuDs) & cultural heritage/archaeology. The proposed landscape design for the development and surface water management proposals have been proposed in an iterative process, to minimise the adverse effects on biodiversity & mature vegetation & the surface water environment. This includes the realignment of the existing stream and associated native hedgerow along its course.

This chapter that this Chapter has been prepared in consideration of an and in conjunction with the relevant outputs of the Biodiversity, Water and Archaeology / Cultural Heritage Chapters.

9.13 DIFFICULTIES ENCOUNTERED IN COMPILING

There were no particular difficulties encountered during the compilation of this section of the EIAR report.

9.14 CONCLUSION

In order to assess the scale or magnitude of landscape and visual impact caused by the proposed development works on the in total 9 no. viewpoints taken, we have compiled a table (see 12.0 'Landscape & Visual Impact on Viewpoints') to itemise the landscape character, landscape significance factors, ecological importance, sensitivity of receptors at the visual receptor points (VRP's).

To summarise our conclusions in relation to the scale or magnitude of the landscape and visual impact occasioned by the proposed development works, we note as follows:

- At the VRP's (V1, V3, V5, V6, V7, V8, V9), shown on table 3, a scale or magnitude of impact was measured as 'nil'. We have concluded that the duration of impact at this viewpoint is 'permanent' and rated the effect of the impact as 'neutral'.
- At the VRP's (V2), shown on table 3, a scale or magnitude of impact was measured as 'low'. We have concluded that the duration of impact at this viewpoint is 'permanent' and rated the effect of the impact as 'neutral'.
- At the VRPs (V4), shown on table 3, a scale or magnitude of impact was measured as 'medium'. We have concluded that the duration of impact at this viewpoint is 'permanent' and rated the effect of the impact as 'neutral'.



◀◀ Angle of View 73° Horizontal (24 mm Lens)

◀◀ Angle of View 39° Horizontal (50 mm Lens)



project: Bridgegate,
Rathgory & Mulladrillen,
Ardee, Co. Louth

photography: 04-08-2020 14:43
Canon 5D Mark II
24 mm Lens

location: Bridgegate,
Rathgory & Mulladrillen,
Ardee, Co. Louth

viewpoint: **View 01** **Baseline**
issued: 25-08-2020





Angle of View 73° Horizontal (24 mm Lens)

Angle of View 39° Horizontal (50 mm Lens)

project: Bridgeway,
Rathgory & Mulladrillen,
Ardee, Co. Louth

photography: 04-08-2020 14:43
Canon 5D Mark II
24 mm Lens

location: Bridgeway,
Rathgory & Mulladrillen,
Ardee, Co. Louth

viewpoint: **View 01** Proposed
issued: 25-05-2021

**MODEL
WORKS**



Angle of View 73° Horizontal (24 mm Lens)

Angle of View 39° Horizontal (50 mm Lens)

project: Bridgegate,
Rathgory & Mulladrillen,
Ardee, Co. Louth

photography: 04-08-2019 14:30
Canon 5D Mark II
24 mm Lens

location: Bridgegate,
Rathgory & Mulladrillen,
Ardee, Co. Louth

viewpoint: **View 02** **Baseline**
issued: 25-08-2020





Angle of View 73° Horizontal (24 mm Lens)

Angle of View 39° Horizontal (50 mm Lens)

project: Bridgegate,
Rathgory & Mulladrillen,
Ardee, Co. Louth

photography: 04-08-2019 14:30
Canon 5D Mark II
24 mm Lens

location: Bridgegate,
Rathgory & Mulladrillen,
Ardee, Co. Louth

viewpoint: **View 02** Proposed
issued: 25-05-2021

**MODEL
WORKS**



◀◀ Angle of View 73° Horizontal (24 mm Lens)

◀◀ Angle of View 39° Horizontal (50 mm Lens)



project: Bridgegate,
Rathgory & Mulladrillen,
Ardee, Co. Louth

photography: 04-08-2020 15:37
Canon 5D Mark II
24 mm Lens

location: Bridgegate,
Rathgory & Mulladrillen,
Ardee, Co. Louth

viewpoint: **View 03** **Baseline**
issued: 25-08-2020

**MODEL
WORKS**



◀◀ Angle of View 73° Horizontal (24 mm Lens)

◀◀ Angle of View 39° Horizontal (50 mm Lens)



project: Bridgegate,
Rathgory & Mulladrillen,
Ardee, Co. Louth

photography: 04-08-2020 15:37
Canon 5D Mark II
24 mm Lens

location: Bridgegate,
Rathgory & Mulladrillen,
Ardee, Co. Louth

viewpoint: **View 03** Proposed
issued: 25-05-2021

**MODEL
WORKS**



◀◀ Angle of View 73° Horizontal (24 mm Lens)

◀◀ Angle of View 39° Horizontal (50 mm Lens)



project: Bridgeway,
Rathgory & Mulladrillen,
Ardee, Co. Louth

photography: 04-08-2020 16:00
Canon 5D Mark II
24 mm Lens

location: Bridgeway,
Rathgory & Mulladrillen,
Ardee, Co. Louth

viewpoint: **View 04** **Baseline**
issued: 25-08-2020





◀◀ Angle of View 73° Horizontal (24 mm Lens)

◀◀ Angle of View 39° Horizontal (50 mm Lens)



project: Bridgeway,
Rathgory & Mulladrillen,
Ardee, Co. Louth

photography: 04-08-2020 16:00
Canon 5D Mark II
24 mm Lens

location: Bridgeway,
Rathgory & Mulladrillen,
Ardee, Co. Louth

viewpoint: **View 04** Proposed
issued: 25-05-2021





◀◀ Angle of View 73° Horizontal (24 mm Lens)

◀◀ Angle of View 39° Horizontal (50 mm Lens)



project: Bridgeway,
Rathgory & Mulladrillen,
Ardee, Co. Louth

photography: 04-08-2020 16:13
Canon 5D Mark II
24 mm Lens

location: Bridgeway,
Rathgory & Mulladrillen,
Ardee, Co. Louth

viewpoint: **View 05** **Baseline**
issued: 25-08-2020





◀◀ Angle of View 73° Horizontal (24 mm Lens)

◀◀ Angle of View 39° Horizontal (50 mm Lens)



project: Bridgeway,
Rathgory & Mulladrillen,
Ardee, Co. Louth

photography: 04-08-2020 16:13
Canon 5D Mark II
24 mm Lens

location: Bridgeway,
Rathgory & Mulladrillen,
Ardee, Co. Louth

viewpoint: **View 05** Proposed
issued: 25-05-2021





◀◀ Angle of View 73° Horizontal (24 mm Lens)

◀◀ Angle of View 39° Horizontal (50 mm Lens)



project: Bridgegate,
Rathgory & Mulladrillen,
Ardee, Co. Louth

photography: 04-08-2020 16:32
Canon 5D Mark II
24 mm Lens

location: Bridgegate,
Rathgory & Mulladrillen,
Ardee, Co. Louth

viewpoint: **View 06** **Baseline**
issued: 25-08-2020

**MODEL
WORKS**



Angle of View 73° Horizontal (24 mm Lens)

Angle of View 39° Horizontal (50 mm Lens)

project: Bridgeway,
Rathgory & Mulladrillen,
Ardee, Co. Louth

photography: 04-08-2020 16:32
Canon 5D Mark II
24 mm Lens

location: Bridgeway,
Rathgory & Mulladrillen,
Ardee, Co. Louth

viewpoint: **View 06** Proposed
issued: 25-05-2021

**MODEL
WORKS**



◀◀ Angle of View 73° Horizontal (24 mm Lens)

◀ Angle of View 39° Horizontal (50 mm Lens)



project: Bridgegate,
Rathgory & Mulladrillen,
Ardee, Co. Louth

photography: 04-08-2020 14:56
Canon 5D Mark II
24 mm Lens

location: Bridgegate,
Rathgory & Mulladrillen,
Ardee, Co. Louth

viewpoint: **View 07** **Baseline**
issued: 25-08-2020

**MODEL
WORKS**



◀◀ Angle of View 73° Horizontal (24 mm Lens)

◀◀ Angle of View 39° Horizontal (50 mm Lens)



project: Bridgegate,
Rathgory & Mulladrillen,
Ardee, Co. Louth

photography: 04-08-2020 14:56
Canon 5D Mark II
24 mm Lens

location: Bridgegate,
Rathgory & Mulladrillen,
Ardee, Co. Louth

viewpoint: **View 07** Proposed
issued: 25-05-2021

**MODEL
WORKS**



Angle of View 73° Horizontal (24 mm Lens)

Angle of View 39° Horizontal (50 mm Lens)

project: Bridgegate,
Rathgory & Mulladrillen,
Ardee, Co. Louth

photography: 04-08-2020 13:55
Canon 5D Mark II
24 mm Lens

location: Bridgegate,
Rathgory & Mulladrillen,
Ardee, Co. Louth

viewpoint: **View 08** **Baseline**
issued: 25-08-2020





◀◀ Angle of View 73° Horizontal (24 mm Lens)

◀◀ Angle of View 39° Horizontal (50 mm Lens)



project: Bridgegate,
Rathgory & Mulladrillen,
Ardee, Co. Louth

photography: 04-08-2020 13:55
Canon 5D Mark II
24 mm Lens

location: Bridgegate,
Rathgory & Mulladrillen,
Ardee, Co. Louth

viewpoint: **View 08** Proposed
issued: 25-05-2021





◀◀ Angle of View 73° Horizontal (24 mm Lens)

◀◀ Angle of View 39° Horizontal (50 mm Lens)



project: Bridgegate,
Rathgory & Mulladrillen,
Ardee, Co. Louth

photography: 04-08-2020 16:50
Canon 5D Mark II
24 mm Lens

location: Bridgegate,
Rathgory & Mulladrillen,
Ardee, Co. Louth

viewpoint: **View 09** **Baseline**
issued: 25-08-2020

**MODEL
WORKS**



Angle of View 73° Horizontal (24 mm Lens)

Angle of View 39° Horizontal (50 mm Lens)

project: Bridgegate,
Rathgory & Mulladrillen,
Ardee, Co. Louth

photography: 04-08-2020 16:50
Canon 5D Mark II
24 mm Lens

location: Bridgegate,
Rathgory & Mulladrillen,
Ardee, Co. Louth

viewpoint: **View 09** Proposed
issued: 25-05-2021

**MODEL
WORKS**

10.0 MATERIAL ASSETS – TRAFFIC

10.1 INTRODUCTION

This chapter of the EIAR assesses and evaluates the likely impact of a proposed 272-unit residential development at Bridgegate, Mulladrillen and Rathgory, Drogheda Road, Ardee, County Louth on the operation of the surrounding road network, as well as identifying proposed mitigation measures to minimise any identified impacts.

This chapter has been prepared by Gordon Finn, Roads and Traffic Engineer with Cronin & Sutton Consulting Engineers (CS Consulting). Gordon holds BA/BAI and MAI degrees in Civil, Structural, and Environmental Engineering from the University of Dublin, and is a member of the Institute of Engineers of Ireland. His relevant professional experience includes the preparation of Traffic Impact Assessments, Travel Plans, and Environmental Impact Assessment Report chapters for a broad range of residential, commercial, and institutional developments.

This chapter is based primarily on the Traffic and Transport Assessment (TTA) report prepared by CS Consulting and submitted separately in support of this planning application. Reference should be made to the TTA for full details of the traffic impact assessment methodology and other transport-related aspects of the proposed development, particularly those that have no bearing on environmental impact.



Figure 10.1 - Site extents, access, and transport infrastructure
(external data/imagery sources: NTA, OSM Contributors, Microsoft)

- This assessment has been carried out in accordance with the following guidance and established best practice:
- Environmental Protection Agency (EPA) *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (2017, Draft);
 - Transport Infrastructure Ireland (TII) *Traffic and Transport Assessment Guidelines* (2014); and
 - Transport Infrastructure Ireland (TII) *Project Appraisal Guidelines 2011*.

Reference has also been made to:

- the *Louth County Development Plan 2021–2027*;
- *Sustainable Urban Housing: Design Standards for New Apartments 2020*
- the Trip Rate Information Computer System (TRICS) database;
- CSO 2016 Census data;
- the *National Cycle Manual*; and
- the *Design Manual for Urban Roads and Streets (DMURS)*.

10.2 STUDY METHODOLOGY

The methodology adopted in preparing this assessment comprises a sequence of key stages, which are summarised below.

10.2.1 Appraisal of Receiving Environment

An initial desktop study was conducted of the area surrounding the development site, identifying the existing transport links and road junctions with the potential to be affected by the proposed development. The characteristics of the surrounding street network were noted, the most relevant elements of which being:

- Drogheda Road / Bridge Street (N2)
- William Street / Moorhall / Hale Street (R170)
- John Street

A site visit was subsequently made to confirm the existing characteristics and conditions of the above streets. Descriptions of these are included in the accompanying TTA report.

As part of the initial appraisal, a review was conducted of the *Louth County Development Plan 2021–2027* and other relevant public sector transport development proposals to determine whether any such development objectives would have an impact on the development site's receiving environment. This review identified 2no. road objectives in the vicinity of the development site, which are described in the accompanying TTA report. As no firm delivery timeframe has been established for these road objectives, however, they have not been considered further in the assessment of the development's traffic impact.

10.2.2 Traffic Survey

Full turning movement classified traffic counts were carried out by Nationwide Data Collection (NDC), on behalf of CS Consulting, over a 12-hour period (07:00–19:00) on Thursday the 3rd of May 2018. Count information was obtained at the following 2no. sites on the N2 (Drogheda Road / Bridge Street) and on the R170 (see Figure 10.2):

J1. Bridge St (N2) / William St (R170) / Drogheda Rd (N2) / John St

(existing 4-arm priority junction)

J2. Drogheda Rd (N2) / Cherrybrook Estate

(existing 3-arm priority junction)



Figure 10.2 – Surveyed road junction sites
(external data/imagery sources: OSM Contributors, Microsoft)

The peak hour traffic flows across the two survey sites were found to occur between 08:30 and 09:30 (AM peak hour) and between 17:45 and 18:45 (PM peak hour). The 2018 surveyed traffic movements during the peak hours have been adjusted to produce baseline traffic flows for the year 2022 by:

- the application of TII growth factors (see section 0); and
- the addition of vehicular traffic generated by nearby development completed between 2018 and 2022 (see section 10.6.1).

The full set of traffic flow data returned by this survey is appended to the accompanying TTA report.

Table 10.1 – Total traffic movements (Passenger Car Units) at surveyed junction sites

Time Period	Total Junction Traffic Movements			
	2018 Surveyed Flows		2022 Baseline Flows	
	J1	J2	J1	J2
AM Peak Hour (08:30-09:30)	1762	826	1949	888
PM Peak Hour (17:45-18:45)	1576	986	1692	1048

10.2.1 Subsequent Assessment Methodology Steps

The following steps form part of the assessment methodology, and are described fully in later sections of this chapter:

- Future Year Background Traffic Growth (see section 0)
- Subject Development Trip Generation (see section 10.5.2)
- Subject Development Trip Distribution (see section 10.5.3)
- Interim Development Trip Generation and Distribution (see section 10.6.1)

- Adjacent Development Trip Generation and Distribution (see section 10.6.2)
- Committed Development Trip Generation and Distribution (see section 10.6.3)

10.2.2 Network Analysis

To determine the likely traffic impact of the proposed development, capacity assessments of the following existing junctions, for both the AM peak hour and the PM peak hour, have been undertaken using industry-standard TRANSYT and PICADY software:

- J1. Bridge St (N2) / William St (R170) / Drogheda Rd (N2) / John St
(existing established 4-arm priority junction)
- J3. Drogheda Rd (N2) / development access
(existing new 3-arm priority junction)

The assessment junctions have been numbered in accordance with the numbering of the surveyed junctions listed in section 10.2.2; J2 therefore does not feature in this list, as this junction was surveyed for the purposes of trip generation and assignment calculations but has not been modelled.



Figure 10.3 – Assessment junction locations
(external data/imagery sources: OSM Contributors, Microsoft)

Assessment of these junctions has been conducted for the following years:

- 2022 Baseline year
- 2024 Proposed opening year
- 2029 5 years after opening
- 2039 Design year (15 years after opening)

Junction performance is assessed based upon the following four metrics:

- Degree of Saturation

The ratio of flow to capacity (also known as RFC) on a link or traffic stream. When calculating this value, account is taken of blocking effects and oversaturation effects.

- Mean Maximum Queue

The highest estimated mean number of Passenger Car Units (PCUs) queued in any lane of a junction approach link, averaged over the entire analysis period.

- Mean Delay per PCU

The average delay incurred by a vehicle on a junction approach link or traffic stream, as a result of having to queue at signals or having to give way at a priority junction.

- Practical Reserve Capacity

The percentage by which the arrival rate on a traffic stream could increase before the stream would be at practical capacity (i.e. 90% saturation).

In the case of a multi-stream junction approach arm, the results presented in this chapter are those of the worst-performing traffic stream under each assessment criterion.

Full TRANSYT and PICADY outputs are provided in Appendix D to the accompanying TTA report.

10.3 THE EXISTING RECEIVING ENVIRONMENT (BASELINE SITUATION)

10.3.1 Pedestrian and Cyclist Infrastructure

Raised footpaths are in place along both sides of the N2 Drogheda Road between its junction with John Street and William Street and the recently constructed junction giving access to the adjacent permitted development to the northwest (planning ref. 10/174), which shall also give vehicular and pedestrian access to the subject development. A southbound raised cycle track is also in place along some sections of this stretch of the N2, including at the recently constructed access junction.

10.3.2 Public Transport

Bus stops located on the N2 (Drogheda Road) within a 10-minute walk of the development site's access junction are served by 4no. bus routes, operated by Bus Éireann and by McConnors Buses, which connect Ardee to Dublin, Drogheda, Dundalk, Carrickmacross, and Monaghan town. These include the no. 167 local service connecting to Ardee Lidl from the town centre, the no. 182 linking Monaghan bus station with Drogheda bus station, and the no. 182A service providing a connection between Ardee and Drogheda.

Any future connection from the proposed development through Cherrybrook to the west (subject to landowner agreement) would bring the western site boundary within approx. 300 metres of the nearest bus stops on the N2 Drogheda Road.

10.3.3 Baseline Junction Performance Assessment

Table 10.2 shows the TRANSYT and PICADY modelling results for the baseline year 2022, at the existing junction of the N2 (Drogheda Road and Bridge Street) with John Street and William Street. These results indicate that this junction currently slightly exceeds effective capacity on its northern approach during the AM peak hour but operates within effective capacity on all other approaches during both peak hour periods, with minor vehicle queues and delays.

This existing junction experiences:

- mean maximum vehicle queues of at most 5 PCU during the AM peak hour and at most 1 PCU during the PM peak hour; and

- mean delays per PCU of at most 21 seconds during the AM peak hour and at most 5 seconds during the PM peak hour.

Table 10.2 – Assessment results for baseline year 2022

Junction Approach Arm	Degree of Saturation		Mean Maximum Queue (PCU)		Mean Delay per PCU (seconds)		Practical Reserve Capacity	
	AM	PM	AM	PM	AM	PM	AM	PM
Junction 1 – Bridge Street (N2) / William Street (R170) / Drogheda Road (N2) / John Street								
N2 Bridge St	92%	66%	5	1	21	3	-2%	36%
R170 William St	59%	42%	0	0	11	5	53%	116%
N2 Drogheda Rd	75%	63%	1	1	5	3	20%	43%
John St	64%	43%	1	0	6	2	40%	108%

10.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

10.4.1 Overview

A full description of the proposed development is provided in Chapter 2 of this EIAR. Briefly, the development proposals constitute an extension to the permitted residential development at Bridgegate, comprising:

- 206no. 2-, 3- and 4-bedroom houses;
- 66no. 1-, 2- and 3-bedroom duplex units;
- a 484m² two-storey crèche and play area; and
- a 165m² single-storey community building.

The proposed development also includes a series of public open spaces (c. 1.8ha) and a c. 3.6ha public park on the northern part of the site.

10.4.2 Vehicle and Cycle Parking

The proposed development shall include a total of 480no. car parking spaces, all located at surface level either on street or within dwelling curtilages. Of these, 446no. spaces shall be allocated to residential units, 23no. spaces shall be provided for the crèche and community building, and 11no. spaces shall be provided to serve visitors and others using the public open space. Table 10.3 assesses this car parking provision with respect to the *Louth County Development Plan 2021–2027* standards.

The 446no. parking spaces provided for the residential units equate to a provision of 1.64 spaces per dwelling. 2016 CSO census data indicate that the average rate of car ownership in the established residential areas surrounding the subject site varies between 1.0 and 1.5 cars per household.

Parking has been allocated to dwellings based on the dwelling type and number of bedrooms. 2-bed houses have been allocated 1no. space while 3-bed and 4-bed houses have been allocated 2no. spaces. Parking for 1-bed duplex units has been provided at a rate of 1no. space per unit while parking for 2-bed and 3-bed duplex units has been provided at a rate of 1.2no. and 1.5no. spaces per unit, respectively.

23no. spaces have been provided to serve the proposed crèche and community building, while 11no. spaces have been provided to serve visitors and others using the public open space.

Table 10.3 – Car parking provision

Land Use (Zone 3)	Car Parking Requirement	Quantum	Required Provision	Proposed Provision
Houses	2 spaces per dwelling	206 dwellings	412 spaces	362 spaces
Duplexes	2 spaces per dwelling	66 dwellings	132 spaces	84 spaces
Crèche	1 space per 6 children	100 children	17 spaces	23 spaces
Community Building	1 space per 30m ² GFA	165m ² GFA	6 spaces	
Public Open Space	Case-by-case basis			11 spaces
Visitor Parking	Case-by-case basis			
Totals			566 spaces	480 spaces

The *Louth County Development Plan 2021–2027* sets out the requirements for bicycle parking provision in new developments by land use type. Table 10.4 shows the standards applicable to the proposed development and illustrates that the development’s bicycle parking provision meets these requirements.

Table 10.4 – Bicycle parking provision – County Development Plan

Land Use	Cycle Parking Minimum	Quantum	Minimum Provision	Proposed Provision
Long-Term Cycle Parking Spaces				
Houses	1 space per unit	206 units	206 spaces	206 spaces (in-curtilage)
Apartments	1 space per bedroom	140 bedrooms	140 spaces	144 spaces
Crèche	1 space per 5 staff	17 staff	3 spaces	10 spaces
Community buildings	1 space per 5 staff	n/a	n/a	2 spaces
Sub-Totals			349 spaces	362 spaces
Short Stay (Visitor) Cycle Parking Spaces				
Houses	1 space per 5 units	206 units	41 spaces	206 spaces (in-curtilage)
Apartments	1 space per 2 units	66 units	33 spaces	60 spaces
Crèche	1 space per 10 children	100 children	10 spaces	10 spaces
Community buildings	1 space per 200m ² GFA	165m ² GFA	1 space	10 spaces
Public parks	n/a	n/a	n/a	60 spaces
Sub-Totals			85 spaces	346 spaces
Combined Cycle Parking Provision				
TOTALS			434 spaces	708 spaces

In the case of the houses within the proposed development, ample space for the secure storage of bicycles shall be available within the curtilage of each dwelling. At a minimum, it is assumed that 2no. bicycles can be

accommodated within the curtilage of each house (1no. space for a resident and 1no. space for a visitor). This is considered to satisfy the Local Authority Development Plan's bicycle parking requirements for houses.

It is noted that the minimum bicycle parking standards for apartments set out in the *Louth County Development Plan 2021–2027* correspond to the cycle parking provision rates recommended by the 2020 policy document *Sustainable Urban Housing: Design Standards for New Apartments (Guidelines for Planning Authorities)*. The development's proposed duplex bicycle parking provision is therefore also in compliance with these Apartment Guidelines

10.4.3 Development Access and Internal Layout

Vehicular and pedestrian access to the development shall be via the internal roads of the adjacent permitted development to the northwest (planning ref. 10/174), which is currently under construction. The adjacent development in turn has vehicular and pedestrian access onto the N2 (Drogheda Road) to the west via a recently constructed simple priority junction.

The subject development's internal layout also makes provision for a potential future vehicular and pedestrian link via the neighbouring Cherrybrook residential estate, to the west of the site. Within the development, a pedestrian/cycle route also extends through the public park up to the site's northern boundary. In addition to this, the internal road network of the subject development allows for potential future road connections to the lands to the east and to the south, if developed.

Raised footpaths are provided along all internal roads of the development. Further footpaths provide pedestrian connectivity between internal roads, as well as to the development's public open spaces and to the public park located at the centre of the development. Cycle tracks are provided along the full length of Bridgewater Avenue, in order to provide suitable facilities for cyclists in the event that this forms part of an east-west connector road in the future. Marked pedestrian crossings of the internal roads are provided at several locations, with raised junctions, raised streets, and horizontal deflections to calm vehicular traffic.

10.4.4 Provision for Potential Future Connector Road

The *Louth County Development Plan 2021–2027* includes as Strategic Settlement Strategy Policy Objective SS 42 the provision of "a new link road from Rathgory and Mulladrillen to Black Road". This east-west connector road, to the south of Ardee town centre, would link the N2 Drogheda Road and Jumping Church Road (Black Road), bypassing William Street and Hale Street. This roads objective appears also to be included among the 'Key Road and Bridge Projects' (Table 7.4) listed in the *Louth County Development Plan 2021–2027*, in which it is referred to as 'Link from N2 Rathgory to Clanmore'.

No preferred alignment for this road objective is given in the *Louth County Development Plan 2021–2027* or shown on its associated maps. However, the Objectives Map forming part of the *Ardee Local Area Plan 2010–2016* (now superseded by the *Louth County Development Plan 2021–2027*) shows an indicative alignment for this road that passes through both the subject development site and the adjacent residential development currently under construction (ref. 10/174), which bounds the subject site to the north-west.

The internal layouts of both the subject development and the adjacent development allow for the potential future provision of such a connector road via these development lands.

Within the permitted and subject developments, two potential alignments have been identified for the future provision of this link (see Figure 10.4):

- a southern route, incorporating the street named Bridgewater Avenue in both developments; and
- a northern route, incorporating the street named Bridgewater Drive in the permitted development and continuing through the northern section of the subject development site.

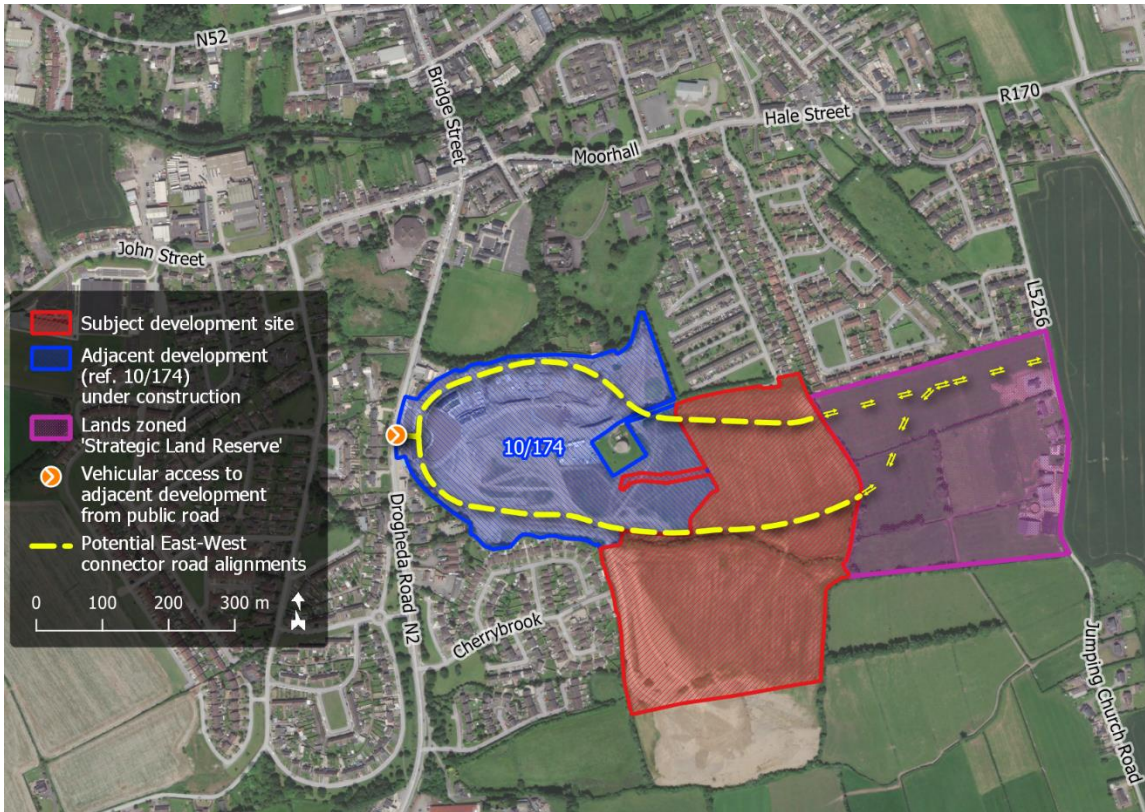


Figure 10.4 – Indicative alignment options for E-W connector road
(external data/imagery sources: NTA, OSM Contributors, Microsoft)

In both developments, those streets with the potential to be incorporated into a future connector road have been designed to allow their use for this purpose. Within the subject development site, a road reservation corridor has been maintained through the northernmost section of the public park area, to permit the future extension of Bridgegate Drive if required.

Lands to the east of the subject development site, which would be required for the full completion of this connector road under Objective SS 42 of the *Louth County Development Plan 2021–2027*, are in third-party ownership and are zoned 'Strategic Land Reserve'. The alignment options between the subject site and Jumping Church Road, illustrated in Figure 10.4, are therefore indicative only and do not form part of this development proposal.

10.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

In both its construction phase and its operational phase, the proposed development shall generate regular vehicular trips on the surrounding road network, increasing traffic flows at nearby existing junctions. Should the resultant total traffic flows at these junctions become too high (particularly at peak times), the junctions may become oversaturated and cease to function efficiently. The purpose of the present assessment is therefore to quantify the trip generation of the proposed development, establish the distribution of these trips and the resultant total traffic flows at nearby junctions, and to assess the operational performance of these junctions with the proposed development in place.

10.5.1 Future Year Background Traffic Growth

The operational impact of traffic on the road network within the proposed development's area of influence has been assessed for the following years:

- 2022 Baseline year
- 2024 Proposed opening year
- 2029 5 years after opening
- 2039 Design year (15 years after opening)

Unit 5.3 of the TII Project Appraisal Guidelines (PE-PAG-02017 *Travel Demand Projections*) has been used to apply growth factors to the 2018 surveyed traffic flows for the baseline year and future year junction assessments. The net cumulative growth factors applied are given in Table 10.5.

Table 10.5 – Predicted background traffic growth

Assessment Year	2022 Baseline Year	2039 Design Year (Opening Year + 15)
Cumulative increase over 2018 background traffic levels	+ 6.1%	+ 26.9%

10.5.2 Subject Development Trip Generation

The subject development comprises the following elements:

- 206no. dwelling houses;
- 66no. duplex units;
- a crèche with a gross floor area of 484m²; and
- a community centre building with a gross floor area of 165m².

The predicted vehicular trip generation of the proposed development's residential elements has been calculated with reference to the nearby residential cul-de-sac of Cherrybrook. The access to the Cherrybrook development is located on the Drogheda Road (N2) and was one of the two junctions surveyed (see section 10.2.2). The recorded arrivals and departures to/from Cherrybrook, for both the AM and PM peak hour periods, are given in Table 10.6.

Table 10.6 – Surveyed arrivals and departures at Cherrybrook

Time Period	Arrivals	Departures	Total Trips
AM Peak Hour (08:30-09:30)	31	71	102
PM Peak Hour (17:45-18:45)	76	54	130

The Cherrybrook estate comprises 109no. residential units, with a mix of detached and semidetached houses. Location-specific residential trip rates were derived through the division of the surveyed Cherrybrook arrival and departure trip numbers by the number of existing residential units. These derived trip rates are given in Table 10.7.

Table 10.7 – Survey-derived residential trip rates

Time Period	Arrivals per residential unit	Departures per residential unit
AM Peak Hour (08:30-09:30)	0.284	0.647
PM Peak Hour (17:45-18:45)	0.695	0.495

The predicted peak hour residential trip generation of the proposed development has been obtained by applying the total number of residential units within the development (272no.) to the trip rates given in Table 10.7. These final residential trip generation figures are given in Table 10.8.

Table 10.8 – Predicted subject development residential trips

Time Period	Arrivals	Departures	Total Trips
AM Peak Hour (08:30-09:30)	77	176	253
PM Peak Hour (17:45-18:45)	189	135	324

For reference, the survey-derived trip generation rates given in Table 10.7 have also been compared to trip rates drawn from the TRICS database under the sub-category '03 Residential / A – Houses Privately Owned'. These trip rates, provided in Table 10.9, were selected from among similar suburban and peripheral locations, and further refined with reference to 2016 CSO census data on the basis of:

- population within 1 mile of the development site (5,000 approx.);
- population within 5 miles of the development site (14,000 approx.);
- aggregate mean car ownership rate within 5 miles of the development site (1.5 cars per household).

Table 10.9 – TRICS residential trip rates

Time Period	Arrivals per residential unit	Departures per residential unit
AM Peak Hour (08:30-09:30)	0.196	0.348
PM Peak Hour (17:45-18:45)	0.391	0.236

As the survey-derived trip rates are higher than those selected from TRICS, and have the benefit of being highly location-specific, it has not been considered appropriate to apply the TRICS trip rates to the residential elements of the subject development.

It should however be noted that the existing Cherrybrook estate, comprising established detached and semidetached houses, is likely to generate vehicular traffic at higher rates than the subject development. To ensure a robust assessment of traffic impact, however, the derived trip generation rates given in Table 10.7 have been applied with no alteration.

The predicted vehicular trip generation of the proposed development's non-residential elements has been calculated from trip rates drawn from the TRICS database. The following TRICS sub-categories have been employed, being the most appropriate for the respective elements of this development:

- 04 Education / D – Nursery
- 07 Leisure / Q – Community Centre

These sub-categories are described in the TRICS land use category definitions as follows:

- Nursery
"Pre-school centres. Trip rates are calculated by Gross Floor Area, Pupils, or Employees."
- Community Centre
"Dedicated centre for community activities. Trip rates are calculated by Gross Floor Area, Site Area, Employees, or Parking Spaces."

The trip rates selected are given in Table 10.10. Full details of the TRICS information used in the assessments are provided in Appendix B to the accompanying TTA report. The resultant trip generation for the non-residential elements of the subject development is given in Table 10.11.

Table 10.10 – TRICS non-residential trip rates

Time Period	Arrivals per 100m ² GFA		Departures per 100m ² GFA	
	Crèche	Community Centre	Crèche	Community Centre
AM Peak Hour (08:30-09:30)	4.107	4.546	3.572	0.802
PM Peak Hour (17:45-18:45)	0.774	3.610	2.233	1.872

Table 10.11 – Predicted subject development non-residential trips

Time Period	Arrivals		Departures	
	Crèche	Community Centre	Crèche	Community Centre
AM Peak Hour	20	8	17	1
PM Peak Hour	4	6	11	3

The development's proposed crèche and community centre are intended primarily to cater for residents of the subject development itself, and to a lesser extent also to residents of other adjacent residential areas. For this reason, it is expected that a significant proportion of trips to and from these development elements shall be made on foot or by bicycle. Of those vehicular trips that are made to and from the crèche and community centre during background traffic peak hours, it is expected that a majority shall be pass-by trips by residents (e.g. dropping off children on the way to work), which are already accounted for within the residential trip generation figure.

The true vehicular traffic generation of the subject development's non-residential elements is therefore likely to be lower than that given in Table 10.11. To ensure a robust assessment of traffic impact, however, non-residential trip generation has been assessed on a stand-alone basis and no discount has been applied.

Table 10.12 – Predicted peak hour subject development trips - Arrivals

Time Period	Residential Dwellings	Crèche	Community Centre	TOTAL Arrivals
AM Peak Hour	77	20	8	105
PM Peak Hour	189	4	6	199

Table 10.13 – Predicted peak hour subject development trips - Departures

Time Period	Residential Dwellings	Crèche	Community Centre	TOTAL Departures
AM Peak Hour	176	17	1	194
PM Peak Hour	135	11	3	149

Table 10.14 – Predicted peak hour subject development trips – Total Trips

Time Period	Residential Dwellings	Crèche	Community Centre	TOTAL Trips
AM Peak Hour	253	37	9	299
PM Peak Hour	324	15	9	348

10.5.3 Subject Development Trip Distribution

Vehicular traffic to and from the subject development may arrive or depart along the Drogheda Road (N2) either from/to the north or from/to the south. It is assumed that vehicular traffic related to the development shall be distributed according to the directional splits currently observed at the surveyed access junction of Cherrybrook. These are given in Table 10.15.

Table 10.15 – Existing surveyed traffic splits at survey junction 2

Time Period	Arrivals to Cherrybrook from:		Departures from Cherrybrook to:	
	N2 North	N2 South	N2 North	N2 South
AM Peak Hour	65%	35%	79%	21%
PM Peak Hour	61%	39%	56%	44%

At the other surveyed junction on the existing road network (that of the N2 with William Street and John Street), it is assumed that vehicular traffic to and from the subject development shall be distributed according to the directional splits currently observed at this location. These splits, for both the AM and PM peak periods, are given in Table 10.16.

Table 10.16 – Existing surveyed traffic splits at survey junction 1

Time Period	Arrivals to Drogheda Road (N2 South) from:			Departures from Drogheda Road (N2 South) to:		
	Bridge St (North)	William St (East)	John St (West)	Bridge St (North)	William St (East)	John St (West)
AM Peak Hour	70%	23%	7%	62%	23%	15%
PM Peak Hour	72%	22%	6%	73%	23%	4%

10.6 POTENTIAL CUMULATIVE IMPACTS

The potential cumulative impacts of the proposed development are represented by its predicted contribution to future traffic flows on the surrounding road network, in conjunction with those of adjacent and nearby committed developments (see sections 10.6.2 and 10.6.3). As is standard practice in the assessment of traffic impact, these other developments' traffic flows have been included by default in all future year assessments, under both the 'Do-Nothing' and 'Do-Something' scenarios. The predicted operational phase impact of the subject development, as described in section 0, is therefore equivalent to the cumulative impact.

10.6.1 Interim Development Trip Generation and Distribution

At the time of the traffic survey conducted in May 2018, planning permission had been granted (ref. 15/670) for the removal of 490m² of existing prefabricated structures at Ardee Community School and the construction of a new 2,911m² standalone extension, with access to/from John Street (see Figure 10.5). These works have since been carried out in the intervening period.

The vehicular trips predicted to be generated by this interim school development have been included in all background traffic flows for the baseline year 2022, as well as for future assessment years. The predicted peak hour trip generation of this development, reproduced in Table 10.17, has been sourced from the Traffic and Transport Assessment report prepared by Duffy Consulting Engineers (DCE) and submitted in support of planning application ref. 15/670. These trips have also been distributed across the local road network as specified in the DCE Traffic and Transport Assessment.

Table 10.17 – Interim development trip generation

Time Period	Arrivals	Departures	Total Trips
AM Peak Hour	49	39	88
PM Peak Hour	8	11	19

It should be noted that the DCE assessment considers a different PM peak hour (15:15-16:15) to that considered in the present assessment (17:45-18:45). The true trip generation of the interim development in the 17:45-18:45 period is likely to be significantly lower; to ensure a robust assessment, however, the interim development’s trip generation and distribution have been adopted from the DCE Traffic and Transport Assessment without modification.



Figure 10.5 – Relevant other nearby developments
(external data/imagery sources: Louth Co. Co. / DoHPLG, OSM Contributors, Microsoft)

10.6.2 Adjacent Development Trip Generation and Distribution

The subject site is bounded to the north-west by a mixed residential development that is currently under construction (see Figure 10.1 and Figure 10.5). Planning permission for this adjacent development was granted under register ref. 10/174 and has since been amended under refs. 19/336, 19/353, 19/549, 19/875 and 21/1475. Vehicular access to/from this development is via a new priority-controlled access junction on N2, which has recently been constructed and which shall also serve as the vehicular access for the subject development. As currently permitted, the adjacent development comprises:

- 155no. residential units;
- a 378m² crèche; and
- a 176m² community facility.

The cumulative vehicular trip generation of the adjacent development, given in Table 10.18, has been calculated in the same manner as that of the subject development: the residential element has been determined based on

surveyed trips to/from the existing Cherrybrook estate on the N2, while non-residential trips have been calculated from the TRICS trip rates given in Table 10.10. These trips have also been distributed across the local road network in the same manner as those of the subject development.

Table 10.18 – Adjacent development trip generation

Time Period	Arrivals	Departures	Total Trips
AM Peak Hour	68	117	185
PM Peak Hour	119	90	209

While a limited number of residential units within the adjacent development have been completed and are in the process of being occupied, it is assumed for the purposes of the present assessment that no vehicular traffic related to this development is yet present on the local road network. It is however assumed that the full level of the adjacent development's operational trip generation shall be present from the year 2024 onward.

10.6.3 Committed Development Trip Generation and Distribution

3no. further active planning permissions have been identified that are considered sufficiently close to the subject development site to have a potential impact on the traffic flows at the junctions considered in this report, if developed as permitted (see Figure 10.5). For the purposes of this assessment, it has been assumed that these shall all proceed and shall be occupied by the year 2024. The projected operational traffic to be generated by these developments has been included in all future year junction assessments.

Table 10.19 – Committed development trip generation

Committed Development	Time Period	Arrivals	Departures	Total Trips
(A)	AM Peak Hour	16	36	52
	PM Peak Hour	38	27	65
(B)	AM Peak Hour	7	17	24
	PM Peak Hour	18	13	31
(C)	AM Peak Hour	53	43	96
	PM Peak Hour	9	17	26

(A) Ref. 19/319

Residential development of 55no. units at Dawson's Demesne, with vehicular access to/from Jumping Church Road via the existing Clonmore residential development.

Trips to be generated by this committed development have been calculated in the same manner as the residential element of the subject development: based upon the recorded arrivals and departures to/from the Cherrybrook estate.

It has been assumed that approximately 50% of all vehicular trips to and from this development shall pass through the N2 / William Street / John Street junction, at which location it is assumed that they shall follow the directional splits currently observed (see Table 10.20).

(B) Refs. 15/670 & 19/734 (ABP ref. 307819-20)

Residential development of 26no. units on a site at the corner of John Street and Stoney Lane, with vehicular access to/from Stoney Lane.

Trips to be generated by this committed development have been calculated in the same manner as the residential element of the subject development: based upon the recorded arrivals and departures to/from the Cherrybrook estate.

It has been assumed that approximately 50% of all vehicular trips to and from this development shall pass through the N2 / William Street / John Street junction, at which location it is assumed that they shall follow the directional splits currently observed (see Table 10.20).

(C) Ref. 18/82

Ardee Educate Together Primary School, comprising 10no. classrooms in total and with a GFA of 1,923m², with vehicular access to/from the N52 (Kells Road).

Trip generation factors from the TRICS database have been used to predict the trip generation to and from this committed development, for both the AM and PM peak hour periods. The TRICS sub-category '04 Education / A – Primary' has been employed, being the most appropriate for this type of development, with trips being calculated on the basis of the proposed total gross floor area (1,923m²). Details of the TRICS information used are included in Appendix B to the accompanying TTA report.

It has been assumed that 50% of all vehicular trips to and from this development shall pass through the N2 / William Street / John Street junction, at which location it is assumed that they shall follow the directional splits currently observed (see Table 10.20).

Table 10.20 – Existing surveyed traffic splits at survey junction 1

Time Period	Arrivals to Bridge St (North) from:			Departures from Bridge St (North) to:		
	William St (East)	Drogheda Rd (South)	John St (West)	William St (East)	Drogheda Rd (South)	John St (West)
AM Peak	21%	47%	32%	24%	44%	32%
PM Peak	17%	58%	25%	27%	52%	21%
Time Period	Arrivals to William St (East) from:			Departures from William St (East) to:		
	Bridge St (North)	Drogheda Rd (South)	John St (West)	Bridge St (North)	Drogheda Rd (South)	John St (West)
AM Peak	41%	28%	31%	37%	27%	36%
PM Peak	47%	32%	21%	36%	34%	30%
Time Period	Arrivals to John Street (West) from:			Departures from John Street (West) to:		
	Bridge St (North)	William St (East)	Drogheda Rd (South)	Bridge St (North)	William St (East)	Drogheda Rd (South)
AM Peak	51%	32%	17%	56%	36%	8%
PM Peak	55%	38%	7%	60%	29%	11%

10.6.4 Potential Cumulative Effects Summary

The potential cumulative impacts of the proposed development are represented by its predicted contribution to future traffic flows on the surrounding road network, in conjunction with those of adjacent and nearby committed developments. These effects are disproportionate to the actual trips generated by the subject development, and arise largely due to the assessed junction's existing operational condition, the influence of background traffic growth, and the addition of traffic generated by other nearby committed developments as identified above. The predicted operational phase impact of the subject development, as described in section 0, is therefore equivalent to the cumulative impact.

10.6.5 Future Irish Water Upgrade Works

Separate Irish Water upgrade works are needed to facilitate development in general in Ardee, including the subject lands, but these do not form part of this application. As part of the conformation of feasibility (CDS20003735) issued in respect of this application, Irish Water has noted the following:

'The existing wastewater network will require upgrades to cater for the additional proposed load. The upgrade will involve upsizing of between 300 and 1000 meters of existing 225mm sewer along the public road. It is not expected that 3rd party permissions will be required outside the requirements for a road opening licence. The exact details of this upgrade can be agreed at connection application stage.'

These future wastewater upgrade works are likely to involve opening up a section of the N2 Drogheda Road between William Street and the subject development's access junction. This will occasion some short-term disruption to local traffic, the effects of which are beyond the scope of this EIAR chapter. No timescale is yet known for the date or duration of such upgrade works. The nature and scale of any temporary traffic control measures to be implemented will be determined by the relevant contractor(s) appointed, and agreed with Irish Water and Louth County Council.

10.7 'DO NOTHING' IMPACT

Table 10.21 shows the 'Do-Nothing' TRANSYT and PICADY modelling results for the design year 2039, at the two junctions that have been assessed. The traffic flows employed for this assessment are those surveyed in 2018, scaled up to 2039 levels using TII growth factors (as described in section 0) and with the addition of traffic generated by interim, adjacent, and committed developments (sections 10.6.1, 10.6.2, and 10.6.3). Traffic generated by the subject development itself is not included.

Table 10.21 – Do-Nothing assessment results for design year 2039

Junction Approach Arm	Degree of Saturation		Mean Maximum Queue (PCU)		Mean Delay per PCU (seconds)		Practical Reserve Capacity	
	AM	PM	AM	PM	AM	PM	AM	PM
Junction 1 – Bridge Street (N2) / William Street (R170) / Drogheda Road (N2) / John Street								
N2 Bridge St	122%	89%	92	3	333	14	-26%	1%
R170 William St	112%	71%	12	1	259	23	-20%	27%
N2 Drogheda Rd	105%	87%	33	3	117	10	-15%	4%
John St	87%	58%	3	0	22	5	3%	56%
Junction 3 – Drogheda Road (N2) / Bridgegate Access								
N2 Drogheda Rd (N)	n/a	n/a	n/a	n/a	n/a	n/a	70%	78%
Bridgegate Access	29%	18%	0	0	14	14		
N2 Drogheda Rd (S)	4%	9%	0	0	6	7		

These results indicate that Junction 3 shall continue to operate well within effective capacity on all junction approaches in the design year 2039, during both the AM and PM peak hour periods, with negligible vehicle queueing

and moderate delays. At Junction 1, however, ultimate capacity shall be exceeded on all but the southern junction approach during the AM peak hour.

Junction 1 shall experience:

- mean maximum vehicle queues of at most 92 PCU during the AM peak hour and at most 3 PCU during the PM peak hour; and
- mean delays per PCU of at most 333 seconds during the AM peak hour and at most 23 seconds during the PM peak hour.

Junction 3 shall experience:

- no measurable vehicle queueing during either peak hour; and
- mean delays per PCU of at most 14 seconds during the AM peak hour and at most 14 seconds during the PM peak hour.

10.8 AVOIDANCE, REMEDIAL & MITIGATION MEASURES

10.8.1 Construction Phase

As described in the accompanying Outline Construction Management Plan (OCMP) report, the lead contractor appointed for the construction of the development will be required to prepare a detailed project-specific Traffic Management Plan and agree this with Louth County Council and An Garda Síochána prior to works commencing on site. The project Specific Traffic Management Plan will include the mitigation contained in this EIAR. This plan will be updated as required throughout the project. Issues addressed in the Traffic Management Plan will include:

- Public safety
- Construction traffic routes
- Deliveries schedule
- Special deliveries (wide and long loads)
- Traffic flows
- Signage and lighting
- Road opening requirements
- Road closures
- Lighting

Construction traffic, and in particular large deliveries, shall be coordinated to ensure that movements during the background peak hours are avoided as much as possible. Construction-related vehicle movements will be minimised through:

- consolidation of delivery loads to/from the site and scheduling of large deliveries to occur outside of peak periods;
- use of precast/prefabricated materials where possible;
- reuse of 'cut' material generated by the construction works on site where possible, through various accommodation works;
- provision of adequate storage space on site;
- development of a strategy to minimise construction material quantities as much as possible;
- promotion of public transport use by construction personnel, in order to minimise staff vehicle movements.

A liaison officer will be appointed as a point of contact with local residents, Louth County Council, and An Garda Síochána.

10.8.2 Operational Phase

The development shall incorporate several design elements intended to mitigate the impact of the development on the surrounding road network during its operational phase. These include:

- pedestrian and cyclist permeability between the N2 Drogheda Road to the west (via the adjacent permitted Bridgegate development) and Hale Street to the north;
- an appropriate car parking provision, which shall discourage higher vehicle ownership rates and excessive vehicular trips to the development (by residents and visitors);
- a high provision of secure bicycle parking, which shall serve to encourage bicycle journeys by both development occupants and visitors; and
- the provision of a new bus stop on Bridgegate Avenue, within 400m of all dwellings within the site, which will facilitate the future provision of a local bus service through the subject development.

10.9 PREDICTED IMPACT OF THE PROPOSED DEVELOPMENT

10.9.1 Construction Phase

The major construction items include excavation and fill, substructure and superstructure construction, and fit-out. As described in the mitigation measures outlined in the EIAR which are included in the accompanying Outline Construction Management Plan (OCMP), it is expected that construction traffic to and from the site shall reach a peak during the preliminary earthworks, which are required to achieve desired levels across the development site. These works shall require the transport from site of approximately 35,000m³ of excavated spoil material. This material is expected to be transported by HGVs with a typical load capacity of 12m³, equating to a total of approximately 2,900 HGV journeys to and from the site.

The final programming and scheduling of this material transfer shall be determined by the appointed contractor. Under a 'worst-case' scenario, however, it is possible that up to 10no. spoil removal trips may be made to the site each hour during this phase (one HGV arrival and one HGV departure every 6 minutes); this would equate to total movements of 20 HGVs in each of the background peak hours, equivalent to 46 Passenger Car Units (PCU). In addition to HGV traffic, periodic deliveries of materials to site shall be made by Light Goods Vehicles (LGVs). Under a worst-case construction traffic generation scenario, 10no. such LGV arrivals and 10no. LGV departures (total traffic movements of 20 PCU) are assumed in each of the background peak hours.

Limited car parking for construction personnel is likely to be provided on site during construction works; some vehicular trips shall therefore be made to and from the site each day by construction personnel commuting to and from work. However, as the site working hours are expected to be from 08:00 to 20:00 (subject to planning conditions), the majority of these trips are expected to fall outside the background traffic peak hours. In the worst case scenario, it is assumed that the equivalent of 50no. light vehicle trips may be made to the site during the AM peak hour, and the equivalent of 50no. such trips may be made from the site during the PM peak hour.

It is therefore expected that – under a worst-case scenario – vehicular traffic to and from the development site during the construction phase shall comprise the following:

- 10no. HGV arrivals and 10no. HGV departures in each of the peak hours;
- 10no. LGV arrivals and 10no. LGV departures in each of the peak hours;
- 50no. car arrivals (construction personnel) in the AM peak hour; and
- 50no. car departures (construction personnel) in the PM peak hour.

The above traffic equates to total vehicle flows (arrivals and departures combined) of 116 PCU in each of the peak hour periods. This is significantly less than the total peak hour vehicle flows predicted to be generated by the subject development during its operational phase (311 PCU in the AM peak hour and 356 PCU in the PM peak hour, as given in Table 10.14). Detailed assessment of traffic impact, in the form of junction performance modelling, has therefore not been conducted in respect of the construction phase.

10.9.2 Operational Phase

Table 10.22 shows the 'Do-Something' TRANSYT and PICADY modelling results for the design year 2039, at the two junctions that have been assessed. The traffic flows employed for this assessment are those surveyed in 2018, scaled up to 2039 levels using TII growth factors (as described in section 0) and with the addition of traffic generated by interim, adjacent, and committed developments (sections 10.6.1, 10.6.2, and 10.6.3), as well as traffic generated by the subject development itself (sections 10.5.2 and 10.5.3).

Table 10.22 – Do-Something assessment results for design year 2039

Junction Approach Arm	Degree of Saturation		Mean Maximum Queue (PCU)		Mean Delay per PCU (seconds)		Practical Reserve Capacity	
	AM	PM	AM	PM	AM	PM	AM	PM
Junction 1 – Bridge Street (N2) / William Street (R170) / Drogheda Road (N2) / John Street								
N2 Bridge St	132%	97%	129	10	437	35	-32%	-7%
R170 William St	112%	71%	16	2	324	57	-24%	5%
N2 Drogheda Rd	120%	96%	97	8	305	30	-25%	-6%
John St	93%	61%	5	0	40	6	-4%	49%
Junction 3 – Drogheda Road (N2) / Bridgegate Access								
N2 Drogheda Rd (N)	n/a	n/a	n/a	n/a	n/a	n/a	5%	18%
Bridgegate Access	82%	56%	4	1	55	31		
N2 Drogheda Rd (S)	11%	24%	0	0	7	8		

These results indicate that Junction 3 shall continue to operate within effective capacity on all junction approaches in the design year 2039, during both the AM and PM peak hour periods, with minimal vehicle queueing and acceptable delays. As under the 'Do-Nothing' scenario, however, ultimate capacity shall be exceeded at Junction 1 on all but the western junction approach during the AM peak hour. In addition, effective capacity shall be exceeded at Junction 1 on the western approach during the AM peak hour and on all but the western approach during the PM peak hour.

Junction 1 shall experience:

- mean maximum vehicle queues of at most 129 PCU during the AM peak hour and at most 10 PCU during the PM peak hour; and
- mean delays per PCU of at most 437 seconds during the AM peak hour and at most 57 seconds during the PM peak hour.

Junction 3 shall experience:

- mean maximum vehicle queues of at most 4 PCU during the AM peak hour and at most 1 PCU during the PM peak hour; and
- mean delays per PCU of at most 55 seconds during the AM peak hour and at most 31 seconds during the PM peak hour.

Table 10.23 compares the results of the assessments under the 'Do-Nothing' and 'Do-Something' scenarios for the design year 2039.

Table 10.23 – Variation between 2039 Do-Nothing and Do-Something assessment results

Junction Approach Arm	Degree of Saturation		Mean Maximum Queue (PCU)		Mean Delay per PCU (seconds)		Practical Reserve Capacity	
	AM	PM	AM	PM	AM	PM	AM	PM
Junction 1 – Bridge Street (N2) / William Street (R170) / Drogheda Road (N2) / John Street								
N2 Bridge St	+10%	+8%	+37	+6	+105	+21	-6%	-8%
R170 William St	+6%	+15%	+3	+1	+65	+35	-4%	-22%
N2 Drogheda Rd	+15%	+9%	+64	+6	+188	+19	-10%	-10%
John St	+6%	+3%	+2	0	+18	+1	-7%	-7%
Junction 3 – Drogheda Road (N2) / Bridgegate Access								
N2 Drogheda Rd (N)	n/a	n/a	n/a	n/a	n/a	n/a	-65%	-60%
Bridgegate Access	+53%	+38%	+3	+1	+41	+17		
N2 Drogheda Rd (S)	+7%	+15%	0	0	+1	+2		

At Junction 1, the addition of operational phase subject development traffic in the design year 2039 shall result in maximum increases of:

- 64 PCU in mean maximum vehicle queue length during the AM peak hour and 6 PCU during the PM peak hour; and
- 188 seconds in mean delay per PCU during the AM peak hour and 35 seconds during the PM peak hour.

At Junction 3, the addition of operational phase subject development traffic in the design year 2039 shall result in maximum increases of:

- 3 PCU in mean maximum vehicle queue length during the AM peak hour and 1 PCU during the PM peak hour; and
- 41 seconds in mean delay per PCU during the AM peak hour and 17 seconds during the PM peak hour.

During the operational phase, the subject development is therefore likely to result in a long-term significant adverse impact on the operational efficiency of Junction 1, in comparison to the Do-Nothing Scenario. This impact should be considered reversible to a degree, as any future measures that reduce local vehicular traffic volumes (e.g. improvements in public transport or cycling infrastructure, alternative new road infrastructure delivery, or changes in general traffic flow restrictions) have the potential to improve the operational efficiency of this junction generally, as well as to reduce vehicle trips to/from the subject development.

These effects are however disproportionate to the actual trip generation of the subject development, and arise largely due to the junction's existing operational condition, the influence of background traffic growth, and the addition of traffic generated by other nearby committed developments. The performance of this junction under the 'Do-Nothing' scenario indicates that intervention shall be required to improve the junction's capacity by the year 2039, irrespective of the proposed development's traffic generation.

10.10 MONITORING

10.10.1 Construction Phase

A Visual Condition Survey (VCS) will be carried out of all surrounding streets prior to any site works commencing. The lead contractor will liaise with the Infrastructure Section of Louth County Council to agree any changes to load restrictions and construction access routes for the site. Measures set out below will be put in place as required to facilitate construction traffic whilst simultaneously protecting the built environment.

All entrances and temporary roads will be continuously maintained for emergency vehicle access. The following measures will be taken to ensure that the site, public roads and surroundings are kept clean and tidy:

- a regular program of site tidying will be established to ensure a safe and orderly site;
- scaffolding will have debris netting attached to prevent materials and equipment being scattered by the wind;
- food waste will be strictly controlled on all parts of the site;
- mud spillages on roads and footpaths outside the site will be cleaned regularly and will not be allowed to accumulate;
- wheel wash facilities will be provided for vehicles exiting the site;
- in the event of any fugitive solid waste escaping the site, it will be collected immediately and removed.

10.10.2 Operational Phase

Post-development monitoring of the surrounding road network's performance is not required or proposed in this case.

10.11 REINSTATEMENT

Reinstatement is not directly applicable to this chapter of this EIAR. No reinstatement works of relevance to traffic and transport are proposed as part of the subject development, with the exception of any repair works necessary to remedy minor damage to the adjoining roads that may possibly result from the passage of construction traffic.

10.12 INTERACTIONS

The vehicular traffic flows that shall be generated by the subject development may result in corresponding changes to air quality and noise levels in the vicinity of the surrounding road network. The natures, extents, and consequences of these changes are examined in Chapters 7 and 8 of this EIAR.

Temporary negative impacts to human health may be likely during the construction phase due to noise, dust, air quality and visual impacts which are discussed in other chapters within this EIAR. The traffic impacts, which would also be temporary in duration are not considered to be significant due to the implementation of the mitigation measures identified.

10.13 RISKS TO HUMAN HEALTH

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 are away from the public road in a controlled environment. Measures will be put in place to access and risk of road traffic accidents during the construction phase. Furthermore, 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 and no unusual substance or underground tunnelling works required or predicted.

10.13.1 Construction Stage

A number of temporary risks to human health may occur during construction phase related to noise, dust, air quality and visual impacts which are addressed in other sections of this EIAR. Traffic impacts are considered to be negligible due to the implementation of mitigation measures identified.

10.13.2 Operational Stage

There will be a slight increase in traffic on the local road network.

10.14 DIFFICULTIES ENCOUNTERED IN COMPILING

No particular difficulties were encountered in completing this chapter of this EIAR.

11.0 MATERIAL ASSETS – WASTE MANAGEMENT

11.1 INTRODUCTION

AWN Consulting has prepared this chapter of the EIAR which assesses and evaluates the likely impact of the generation of waste materials arising during the construction and operational phases of the proposed development.

This Chapter was prepared by Chonaill Bradley of AWN Consulting. Chonaill Bradley is a Senior Environmental Consultant in the Environment Team at AWN. He holds a BSc in Environmental Science. He is an Associate Member of the Institute of Waste Management (CIWM). Chonaill has over seven years' experience in the environmental consultancy sector.

A site-specific Construction and Demolition Waste Management Plan (C&D WMP) has been prepared to deal with waste generation during the construction phase of the project and is included as Appendix 11.1. The C&D WMP was prepared in accordance with the 'Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects' document produced by the National Construction and Demolition Waste Council (NCDWC) in conjunction with the Department of the Environment, Heritage and Local Government in July 2006.

A separate Operational Waste Management Plan (OWMP) has also been prepared for the operational phase of the development and is included as Appendix 11.2.

The Chapter has been prepared in accordance with EPA Guidelines on the Information to be contained in EIAR (2017, Draft).

These documents will ensure the sustainable management of wastes arising at the development in accordance with legislative requirements and best practice standards.

11.2 METHODOLOGY

The assessment of the impacts of the proposed development arising from the consumption of resources and the generation of waste materials, was carried out taking into account the methodology specified in relevant guidance documents, along with an extensive document review to assist in identifying current and future requirements for waste management including national and regional waste policy, waste strategies, management plans, legislative requirements and relevant reports. A summary of the documents reviewed, and the relevant legislation is provided in Appendices 11.1 & 11.2.

This Chapter is based on the proposed development, as described in Chapter 2 of the EIAR and considers the following aspects:

- Legislative context;
- Construction phase (including site preparation and excavation); and,
- Operational phase.

A desk study was carried out which included the following:

- Review of applicable policy and legislation which creates the legal framework for resource and waste management in Ireland;
- Description of the typical waste materials that will be generated during the construction and operational phases; and
- Identification of mitigation measures to prevent waste generation and promote management of waste in accordance with the waste hierarchy.

Estimates of waste generation during the construction and operational phases of the proposed development have been calculated. The waste types and estimated quantities are based on published data by the EPA in the National Waste Reports and National Waste Statistics, data recorded from similar previous developments, Irish and US EPA waste generation research and other available research sources.

Mitigation measures are proposed to minimise the effect of the proposed development on the environment during the construction and operational phases, to promote efficient waste segregation and to reduce the quantity of waste requiring disposal. This information is presented in Section 11.8.

A detailed review of the existing ground conditions on a regional, local and site-specific scale are presented in Chapter 5 Land and Soils. Chapter 5 of the EIAR also discusses the environmental quality of any soils which will have to be excavated to facilitate construction of the proposed development.

11.2.1 Legislation and Guidance

Waste management in Ireland is subject to EU, national and regional waste legislation, which defines how waste materials must be managed, transported and treated. The overarching EU legislation is the Waste Framework Directive (2008/98/EC) which is transposed into national legislation in Ireland. The cornerstone of Irish waste legislation is the Waste Management Act 1996 (as amended). European and national waste management policy is based on the concept of ‘waste hierarchy’, which sets out an order of preference for managing waste (prevention > preparing for reuse > recycling > recovery > disposal) (Figure 11.1).

Figure 11.1: Waste Hierarchy (Source: European Commission)



The Irish government issues policy documents which outline measures to improve waste management practices in Ireland and help the country to achieve EU targets in respect of recycling and disposal of waste. The most recent policy document, *Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland*, was published in 2020 and shifts focus away from waste disposal and moves it back up the production chain. The move away from targeting national waste targets is due to the Irish and international waste context changing in the years since the launch of the previous waste management plan, *A Resource Opportunity*, in 2012. The need to embed climate action in all strands of public policy aligns with the goals of the European Green Deal.

The strategy for the management of waste from the construction phase is in line with the requirements of the *Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects*, published by the Department of Environment, Heritage and Local Government (DoEHLG) in 2006. The guidance documents, *Construction and Demolition Waste Management: A Handbook for Contractors and Site Managers* (FÁS & Construction Industry Federation, 2002) and Environmental Protection Agency (EPA) ‘Best Practice Guidelines for the Preparation of Resource Management Plans for Construction & Demolition Projects’ Draft for public consultation (April 2021) were also consulted in the preparation of this assessment.

There are currently no Irish guidelines on the assessment of operational waste generation and guidance is taken from industry guidelines, plans and reports including the EMR Waste Management Plan 2015 – 2021, BS 5906:2005 Waste Management in Buildings – Code of Practice, 5. The Louth County Council (LCC) Louth County Council

(Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws 2018, the EPA National Waste Database Reports 1998 – 2018 and the EPA National Waste Statistics Web Resource.

11.2.2 Terminology

Note that the terminology used herein is generally consistent with the definitions set out in Article 3 of the Waste Framework Directive. Key terms are defined as follows:

Waste - Any substance or object which the holder discards or intends or is required to discard.

Prevention - Measures taken before a substance, material or product has become waste, that reduce:

- a) the quantity of waste, including through the re-use of products or the extension of the life span of products;
- b) the adverse impacts of the generated waste on the environment and human health; or
- c) the content of harmful substances in materials and products.

Reuse - Any operation by which products or components that are not waste are used again for the same purpose for which they were conceived.

Preparing for Reuse - Checking, cleaning or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be re-used without any other pre-processing.

Treatment - Recovery or disposal operations, including preparation prior to recovery or disposal.

Recovery - Any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy. Annex II of the Waste Framework Directive sets out a non-exhaustive list of recovery operations.

Recycling - Any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.

Disposal - Any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy.

11.3 RECEIVING ENVIRONMENT

The construction and operation of the proposed development will introduce new volumes of waste into the local area in terms of the short-term generation of construction waste and the longer-term generation of domestic waste when the development is occupied.

In terms of waste management, the receiving environment is largely defined by Louth County Council (LCC) as the local authority responsible for setting and administering waste management activities in the area. This is governed by the requirements set out in the *Eastern-Midlands Region (EMR) Waste Management Plan 2015 – 2021*.

The waste management plan sets the following targets for waste management in the region:

- A 1% reduction per annum in the quantity of household waste generated per capita over the period of the plan;
- Achieve a recycling rate of 50% of managed municipal waste by 2020; and
- Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill (from 2016 onwards) in favour of higher value pre-treatment processes and indigenous recovery practices.

The Regional Plan sets out the strategic targets for waste management in the region and sets a specific target for C&D waste of “70% preparing for reuse, recycling and other recovery of construction and demolition waste” (excluding natural soils and stones and hazardous wastes) to be achieved by 2020. The Waste Action Plan for a Circular Economy continues with this target of keeping the reuse, recycling and other recovery of construction and demolition waste at or above 70%.

The National Waste Statistics update published by the EPA in August 2020 identifies that Ireland's current progress against this C&D waste target is at 77% and our progress against 'Preparing for reuse and recycling of 50% by weight of household derived paper, metal, plastic & glass (includes metal and plastic estimates from household WEEE)' is at 51%. Both of these targets are required to be met by 12 December 2020 in accordance with the requirements of the Waste Framework Directive, however the EPA are yet to confirm that these were met.

The Louth County Development Plan 2021 -2027 contains policy objectives for the LCC area which reflect those set out in the regional waste management plan.

In terms of physical waste infrastructure, there are a number of waste permitted and licensed facilities located in the Eastern-Midlands Waste Region for management of waste from the construction industry as well as municipal sources. These include soil recovery facilities, inert C&D waste facilities, hazardous waste treatment facilities, municipal waste landfills, material recovery facilities, waste transfer stations and two waste-to-energy facilities.

11.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

A full description of the development can be found in Chapter 2. The characteristics of the development that are relevant in terms of waste management are summarised below.

11.4.1 Demolition Phase

There will be no demolition associated with this development.

11.4.2 Construction Phase

During the construction phase, waste will be produced from surplus materials such as broken or off-cuts of timber, plasterboard, concrete, tiles, bricks, etc. Waste from packaging (cardboard, plastic, timber) and oversupply of materials may also be generated. The construction contractor will be required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

In addition, topsoil, subsoil and clay will be excavated to facilitate site preparation, construction of the building foundations and access roads and the installation of underground services. The project engineers (CS Consulting) have estimated that the quantity of excavated material that will be generated has been estimated to be c. 42,096m³. Any suitable excavated material will be temporarily stockpiled for reuse as fill, where possible, but reuse on site is expected to be limited to c. 7,865m³. It is expected that the remaining c. 34,231m³ of excavated material is to be removed off site for appropriate reuse, recovery and/or disposal. Surplus material that requires removal from site is deemed to be a waste, removal and reuse/recycling/recovery/disposal of the material will be carried out in accordance with the *Waste Management Act 1996* (as amended), the *Waste Management (Collection Permit) Regulations 2007* (as amended) and the *Waste Management (Facility Permit & Registration) Regulations 2007* (as amended). The volume of waste requiring recovery/disposal will dictate whether a Certificate of Registration (COR), permit or license is required by the receiving facility.

In order to establish the appropriate reuse, recovery and/or disposal route for the material to be removed off-site, it will first need to be classified. Waste material will initially need to be classified as hazardous or non-hazardous in accordance with the EPA publication *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous*. Environmental soil analysis will be carried out prior to removal of the material on a number of the soil samples in accordance with the requirements for acceptance of waste at landfills (Council Decision 2003/33/EC Waste Acceptance Criteria). This legislation sets limit values on landfills for acceptance of waste material based on properties of the waste including potential pollutant concentrations and leachability. It is anticipated that the surplus material will be suitable for acceptance at either inert or non-hazardous soil recovery facilities/landfills in Ireland or, in the unlikely event of hazardous material being encountered, be transported for treatment/recovery or exported abroad for disposal in suitable facilities.

Waste will also be generated from construction workers e.g. organic/food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and potentially sewage sludge from temporary welfare facilities provided onsite during the construction phase. Waste printer/toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated infrequently from site offices.

Further detail on the waste materials likely to be generated during the excavation and construction works are presented in Appendix 11.1. AWN have estimated the main waste types using EPA National Waste Reports and the GMIT research report 146, along with further research reports. The estimated likely waste to be generated during the construction phase of the proposed development and its likely reuse, recycle/recovery and disposal rates are summarised in Table 11.1.

Table 11.1 Offsite Reuse, Recycle/Recovery and Disposal Rates for Construction Waste

Waste Type	Tonn	Reuse		Recycle/Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&I	63.	10	56.4	80	450.9	10	56.4
Timber	78.	40	191.3	55	263.1	5	23.9
asterboa	70.	30	51.2	60	102.5	10	17.1
Metals	36.	5	6.8	90	123.0	5	6.8
Concrete	02.	30	30.7	65	66.6	5	5.1
Other	56.	20	51.2	60	153.7	20	51.2
Total	708		387.7		1159.8		160.6

It should be noted that until final materials and detailed construction methodologies have been confirmed it is difficult to predict with a high level of accuracy the construction waste that will be generated from the construction of the proposed development as the exact materials and quantities may be subject to some degree of change and variation during the construction process. However, the above estimates are considered to be the worst-case scenario.

11.4.3 Operational Phase

As noted in Section 11.1, an OWMP has been prepared for the development and is included as Appendix 11.2. The OWMP provides a strategy for segregation (at source), storage and collection of all wastes generated within the building during the operational phase including dry mixed recyclables, organic waste and mixed non-recyclable waste as well as providing a strategy for management of waste glass, batteries, WEEE, printer/toner cartridges, chemicals, textiles, waste cooking oil, furniture and abandoned bicycles.

The total estimated waste generation for the development for the main waste types is presented in Table 11.2 below and is based on the uses and areas as advised by the project architects (Darmody Architects) May 2021.

Table 11.2 Estimated waste generation for the main waste types

Waste type	Waste Volume (m ³ /week)	
	Residentia	Crèche
Organic Waste	5.17	0.05
Dry Mixed Recyclable	37.87	1.75
Mixed Municipal Was	1.00	0.01
Glass	18.02	0.96
Total	62.1	2.76

The residents and tenants will be required to provide and maintain appropriate waste receptacles within their units to facilitate segregation at source of these waste types. The location of the bins within the units will be at the discretion of the residents. As required, the residents, staff and tenants will need to bring these segregated wastes from their units to their allocated Waste Storage Areas (WSAs). All WSA's can be viewed on the plans submitted with the application.

The OWMP seeks to ensure the development contributes to the targets outlined in the EMR Waste Management Plan 2015 – 2021 and the LCC waste Bye-laws.

Mitigation measures proposed to manage impacts arising from wastes generated during the operation of the proposed development are outlined at section 11.8 below.

11.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

This section details the potential waste effects associated with the proposed development.

11.5.1 Construction Phase

The proposed development will generate a range of non-hazardous and hazardous waste materials during site excavation and construction. General housekeeping and packaging will also generate waste materials as well as typical municipal wastes generated by construction employees including food waste. Waste materials will be required to be temporarily stored on site pending collection by a waste contractor. If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development and on adjacent developments. The indirect effect of litter issues is the presence of vermin within the development and the surrounding areas. In the absence of mitigation measures the effect on the local environment is likely to be **short term, significant and negative**.

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste and result in indirect negative environmental impacts or pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **Long term, significant and negative**.

Wastes arising will need to be taken to suitably registered/permitted/licenced waste facilities for processing and segregation, reuse, recycling, recovery, and/or disposal as appropriate. There are numerous licensed waste facilities in the Eastern Midlands region which can accept hazardous and non-hazardous waste materials and acceptance of waste from the proposed development would be in line with daily activities at these facilities. At present, there is sufficient capacity for the acceptance of the likely C&D waste arisings at facilities in the region. The majority of construction materials are either recyclable or recoverable. In the absence of mitigation measures the effect on the local environment is likely to be **short term, significant and negative**.

There is a quantity of excavated material which will need to be excavated to facilitate the proposed development. A detailed review of the existing ground conditions on a regional, local site-specific scale are presented in Chapter 5. It is anticipated that between c. 34,231m³ of excavated material will need to be removed offsite, however it is envisaged that c.7,865m³ of excavated material will be reused onsite. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **short term, significant and negative**.

11.5.2 Operational Phase

The potential impacts on the environment of improper, or a lack of, waste management during the operational phase would be a diversion from the priorities of the waste hierarchy which would lead to small volumes of waste being sent unnecessarily to landfill. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **long term, significant and negative**.

The nature of the development means the generation of waste materials during the operational phase is unavoidable. Networks of waste collection, treatment, recovery and disposal infrastructure are in place in the region to manage waste efficiently from this type of development. Waste which is not suitable for recycling is typically sent for energy recovery. There are also facilities in the region for segregation of municipal recyclables which is typically exported for conversion in recycled products (e.g. paper mills and glass recycling).

If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development and on adjacent developments. The knock-on effect of litter issues is the presence of vermin within the development and the surrounding areas. However, in the absence of mitigation, the effect on the local environment is likely to be **short term, significant and negative**.

Waste contractors will be required to service the development on a regular basis to remove waste. The use of non-permitted waste contractors or unauthorised facilities could give rise to inappropriate management of waste and result in negative environmental impacts or pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. However, in the absence of mitigation, the effect on the local environment is likely to be long term, significant and negative.

11.6 POTENTIAL CUMULATIVE IMPACTS

The potential cumulative impacts of the proposed development on Material Assets – Waste Management have been considered in conjunction with the ongoing changes in the surrounding area. In this regard, existing and permitted developments in the vicinity have been reviewed which could have a cumulative impact along with the current proposal in terms of population and human health. These include the parent permission at Phase 1-3 of Bridgegate (permitted under Louth County Council Reg. Ref.: 10174; ABP Ref: PL15.238053 amended under permissions Reg. Refs.: 19336, 19353, 19549, 19875 and 211475) (under construction to the west) for 155 no. residential units, community building, crèche and public park.

11.6.1 Construction Phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place for both residential and commercial developments within the vicinity of the proposed Project. In a worst-case scenario, multiple developments in the area could be developed concurrently or overlap in the Construction Phase. Due to the high number of waste contractors in the Louth region there would be sufficient contractors available to handle waste generated from a large number of these sites simultaneously, if required. Similar waste materials would be generated by all the developments.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise/mitigate any potential cumulative effects associated with waste generation and waste management. As such the effect will be short-term, not significant and neutral.

11.6.2 Operational Phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place and the potential for more future development in the area. All of the current and potential developments will generate similar waste types during their operational phases. Authorised waste contractors will be required to collect waste materials segregated, at a minimum, into recyclables, organic waste and non-recyclables. An increased density of development in the area is likely improve the efficiencies of waste collections in the area.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise/mitigate any potential cumulative impacts associated with waste generation and waste management. As such the effect will be a **long-term, imperceptible** and **neutral**.

11.7 'DO NOTHING' IMPACT

If the proposed development was not to go ahead there would be no excavation or construction or operational waste generated at this site. there will would be a neutral effect on the environment.

11.8 MITIGATION MEASURES

This section outlines the measures that will be employed in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle the waste in such a manner as to minimise the effects on the environment.

11.8.1 Construction Phase

As previously stated, a project specific C&D WMP has been prepared in line with the requirements of the guidance document issued by the DoEHLG and is included with the application (Appendix 11.1), The mitigation measures outlined in the C&D WMP will be implemented in full and form part of mitigation strategy for the site. The mitigation measures presented in this C&D WMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the excavation and construction phases of the proposed

development. Prior to commencement of site works the contractor(s) will be required to refine/update the C&D WMP or submit an addendum to C&D WMP to LCC to detail specific measures to minimise waste generation and resource consumption and provide details of the proposed waste contractors and destinations of each waste stream.

The project engineers have estimated that c. 42,096m³ of material will be generated from the excavations required to facilitate the construction of the basement, building foundations and the installation of underground services. It is anticipated that this material will require removal from site for offsite reuse, recovery, recycling and/or disposal. The contractor(s) will endeavor to ensure that material is reused or recovered off-site insofar as is reasonably practicable or disposed of at authorized facility.

In addition, the following mitigation measures will be implemented:

- Building materials will be chosen with an aim to 'design out waste';
- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery – it is anticipated that the following waste types, at a minimum, will be segregated:
 - Concrete rubble (including ceramics, tiles and bricks);
 - Plasterboard;
 - Metals;
 - Glass; and
 - Timber.
- Left over materials (e.g. timber off-cuts, broken concrete blocks/bricks) and any suitable construction materials shall be re-used on-site, where possible;
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
- A waste manager will be appointed by the main contractor(s) to ensure effective management of waste during the excavation and construction works;
- All construction staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered where possible to avoid material designated for disposal;
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

Nearby sites requiring clean fill material will be contacted to investigate reuse opportunities for clean and inert material, if required. If any of the material is to be reused on another site as by-product (and not as a waste), this will be done in accordance with Article 27 of the *EC (Waste Directive) Regulations (2011)*. EPA approval will be obtained prior to moving material as a by-product. However, it is not currently anticipated that article 27 will be utilised to move waste off-site.

These mitigation measures will ensure that the waste arising from the construction phase of the development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations, the Litter Pollution Act 1997, the EMR Waste Management Plan (2015 - 2021) and the LCC *Waste Bye-Laws, 2019*. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will encourage sustainable consumption of resources.

11.8.1 Operational Phase

As previously stated, a project specific OWMP has been prepared and is included as Appendix 11.2, The mitigation measures outlined in the OWMP will be implemented in full and form part of mitigation strategy for the site. Implementation of this OWMP will ensure a high level of recycling, reuse and recovery at the development. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the targets set out in the EMR Waste Management Plan 2015 – 2021 and the LCC waste bye-laws.

In addition, the following mitigation measures will be implemented:

- On-site segregation of all waste materials into appropriate categories including (but not limited to):
 - Organic waste;
 - Dry Mixed Recyclables;
 - Mixed Non-Recyclable Waste;
 - Glass;
 - Waste electrical and electronic equipment (WEEE);
 - Batteries (non-hazardous and hazardous);
 - Cooking oil;
 - Light bulbs;
 - Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.);
 - Furniture (and from time to time other bulky waste); and
 - Abandoned bicycles.
- All waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials;
- All waste collected from the development will be reused, recycled or recovered where possible, with the exception of those waste streams where appropriate facilities are currently not available; and
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.

These mitigation measures will ensure the waste arising from the development is dealt with in compliance with the provisions of the *Waste Management Act 1996*, as amended, associated Regulations, the *Litter Pollution Act 1997*, the *EMR Waste Management Plan (2015 - 2021)* and the LCC waste bye-laws. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

11.9 PREDICTED IMPACT OF THE PROPOSED DEVELOPMENT

The implementation of the mitigation measures outlined in Section 11.8 will ensure that a high rate of reuse, recovery and recycling is achieved at the development during the excavation and construction phases as well as during the operational phase. It will also ensure that European, National and Regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved.

11.9.1 Construction Phase

A carefully planned approach to waste management as set out in Section 11.8 and adherence to the C&D WMP (which include mitigation) during the construction phase will ensure that the effect on the environment will be short-term, imperceptible and neutral.

11.9.2 Operational Phase

During the operational phase, a structured approach to waste management as set out in Section 11.8 and adherence to the OWMP (which include mitigation) will promote resource efficiency and waste minimisation. Provided the mitigation measures are implemented and a high rate of reuse, recycling and recovery is achieved, the predicted effect of the operational phase on the environment will be long-term, imperceptible and neutral.

11.10 MONITORING

The management of waste during the construction phase shall be monitored to ensure compliance with relevant local authority requirements, and effective implementation of the C&D WMP including maintenance of waste documentation.

The management of waste during the operational phase shall be monitored to ensure effective implementation of the OWMP by the building management company and the nominated waste contractor(s).

11.10.1 Construction Phase

The objective of setting targets for waste management is only achieved if the actual waste generation volumes are calculated and compared. This is particularly important during the excavation and construction phases where there

is a potential for waste management to become secondary to progress and meeting construction schedule targets. The mitigation measures in the C&D WMP specifies the need for a waste manager to be appointed who will have responsibility to monitor the actual waste volumes being generated and to ensure that contractors and sub-contractors are segregating waste as required. Where targets are not being met, the waste manager shall identify the reasons for targets not being achieved and work to resolve any issues. Recording of waste generation during the project will enable better management of waste contractor requirements and identify trends. The data should be maintained to advise on future projects.

11.10.2 Operational Phase

During the operational phase, waste generation volumes should be monitored against the predicted waste volumes outlined in the OWMP. There may be opportunities to reduce the number of bins and equipment required in the WSAs where estimates have been too conservative. Reductions in bin and equipment requirements will improve efficiency and reduce waste contractor costs.

Waste legislation should also be consulted on a regular basis in case of any changes which may impact on waste management procedures.

11.11 REINSTATEMENT

In the event that the proposed development is discontinued, there is not likely to be any significant impacts on waste management at the site.

11.12 INTERACTIONS

Adherence to the mitigation measures outlined in Section 11.8.1 and 11.8.2 will ensure that there are no significant impacts on resource or waste management from the proposed development. The management of waste during the construction phase in accordance with the C&D WMP and during the operational phase in accordance with the OWMP will meet the requirements of regional and national waste legislation and promote the management of waste in line with the priorities of the waste hierarchy.

11.12.1 Land and Soils

During the construction phase excavated material (c. 42,096m³) will be generated from the excavations required to facilitate construction of the new foundations, site levelling and the installation of underground services. It is envisaged that 34,231m³ excavated material will be taken offsite it will be taken for reuse or recovery, where practical, with disposal as last resort. Adherence to the mitigation measures in Chapter 11 and the requirements of the C&D Waste Management Plan will ensure the effect is long-term, imperceptible and neutral.

11.12.2 Traffic and Transportation

Local traffic and transportation will be impacted by the additional vehicle movements generated by removal of waste from the site during the construction and operational phases of the development. The increase in vehicle movements as a result of waste generated during the construction phase will be temporary in duration. There will be an increase in vehicle movements in the area as a result of waste collections during the operational phase but these movement will be imperceptible in the context of the overall traffic and transportation increase and has been addressed in Chapter 10 Material Assets – Traffic. Provided the mitigation measures detailed in Chapter 11 and 10 and the requirements of the OWMP (included as Appendix 11.2) are adhered to, the effects should be short to long-term, imperceptible and neutral.

11.12.3 Population and Human Health

The potential impacts on human beings in relation to the generation of waste during the construction and operational phases are that incorrect management of waste could result in littering which could cause a nuisance to the public and attract vermin. A carefully planned approach to waste management and adherence to the project specific C&DWMP and OWMP, will ensure appropriate management of waste and avoid any negative impacts on the local population. The effects will be long-term, imperceptible and neutral.

11.13 DIFFICULTIES ENCOUNTERED IN COMPILING

Until final materials and detailed construction methodologies have been confirmed, it is difficult to predict with a high level of accuracy the construction waste that will be generated from the proposed works as the exact materials and quantities may be subject to some degree of change and variation during the construction and detailed design process.

12.0 MATERIAL ASSETS- UTILITIES

12.1 INTRODUCTION

This chapter evaluates the impacts, if any, which the proposed development at Bridgegate, Rathgory and Mulladrillen, Drogheda Road, Ardee, County Louth may have on built services and infrastructure.

This Chapter has been prepared by Emma Cross, an Environmental Consultant with AWN Consulting. Emma holds a B.A. in Natural Science from Trinity College Dublin and an M.Sc. Environmental Sustainability from University College Dublin. Emma has worked on projects relating to the remediation of agricultural wastes and residues, and also has experience with natural resource management and sustainability models. Emma has prepared specialist inputs for numerous EIA Reports and EIA Screening Reports.

12.2 METHODOLOGY

The EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports Draft August 2017 state that material assets are now taken to mean built services and infrastructure, roads and traffic and waste management. The EPA Draft Advice Notes for EIS 2015 also give the following examples of material assets; assimilative capacity of air, ownership and access and tourism. In this EIA Report, the impacts on some of the material assets described above have been considered in the following chapters of this EIA Report as follows:

- Chapter 3 Population and Human Health;
- Chapter 7 Air & Climate;
- Chapter 10 Material Assets - Traffic; and
- Chapter 11 Material Assets - Waste Management.

This chapter assesses ownership and access, built services and infrastructure, which have not already been addressed elsewhere in this EIA Report. Section 12.3 addresses ownership and access. The subsequent sections address built services and infrastructure. The potential impacts on built services and infrastructure, if any, are assessed in terms of the following:

- Power and Electrical Supply;
- Telecommunications;
- Surface water infrastructure;
- Foul drainage infrastructure; and
- Water supply.

The proposed development will not impact on any other structures or water resources.

Assessment of impact on utilities has been undertaken by confirmation of supply with the utility supplier. Mitigation measures are proposed where required.

12.3 OWNERSHIP AND ACCESS

The site of the proposed development as described in Chapter 2 (Project Description and Alternatives Examined) is owned by the Earlstone DAC, a partner in The Ardee Partnership, the applicant. A letter of consent, enabling the applicant to apply for development on the lands owned by Earlstone DAC, is included with the planning application.

The main access to the site will be northwest of the proposed development site, via Phases 1-3 of Bridgegate currently under construction (LCC Refs. 10/174 and 19/336).

During construction the proposed development will be accessed through Drogheda Road (N2), via the residential R086 Construction Management Plan site that is currently under construction northwest of the site. All vehicular access routes during the construction phase will be laid out in accordance with the requirements of Chapter 8 of the Traffic Signs Manual.

Security personnel will be present at the site entrance/exit to ensure that all traffic exiting the construction site does so safely. A wheel wash will be installed at the exit from the site, to prevent excess dirt being carried out into the public road. If necessary, a road sweeper will be used to keep the public road around the site clean.

12.4 RECEIVING ENVIRONMENT

The proposed drainage infrastructure has been described in Chapter 2 (Project Description and Alternatives Examined) and Chapter 6 (Water). Detailed water supply and drainage design information is provided in the *Engineering Services Report* prepared by CS Consulting, which accompanies the planning application.

The associated built services and infrastructure in the vicinity of the site are summarised in the following sections.

12.4.1 Power and Electrical Supply

The proposed development site is greenfield and does not have a current connection into the local ESB network. The proposed development currently has a live ESB Electrical network supply to the west of the site.

There are existing ESB overground MV/LV line crossing through the northern area of the proposed development site. This area of the site is a landscaped area, and no residential development is proposed for this area as part of this application. There is no known existing ESB overground and underground infrastructure located in the area of the proposed residential development

Two new ESB sub stations are required to cater for the electrical requirement of the residential development, the substations have been designed into the proposed residential scheme. A formal application to confirm the nature of the ESB supply is made once the formal address of the residential development is agreed with LCC.

The power supply infrastructure for the proposed development site will require an extension of the existing power supply infrastructure currently in place and under construction for the permitted residential development to the west of the site.

12.4.2 Telecommunications

The proposed development site is greenfield and does not have a current connection into the local telecommunications network. The proposed development currently has a live telecommunications network supply to the west of the site.

The telecommunication infrastructure for the proposed development site will require an extension of the existing infrastructure currently in place and under construction for the permitted residential development to the west of the site.

12.4.3 Surface Water Infrastructure

The proposed development site is greenfield and does not currently have any engineered surface water drainage system in place. The open nature of the site and the natural existing gradients has led the majority of the site to drain to the south into a tributary of the River Dee. As noted, the site does have an existing water course through the center of the site (refer to drawing ARDEE-CSC-00-XX-DR-C-1000 Topographical Survey submitted with the planning application for the existing topographical survey of the site).

12.4.4 Foul Drainage Infrastructure

The proposed development site is greenfield and does not currently have any foul drainage infrastructure in place. The proposed development will require a new separate foul drainage network to collect and convey the effluent generated by the proposed development. All effluent generated in Ardee, including that from the proposed development, is conveyed to the Regional Wastewater Treatment Plant (EPA Licence Number D0117/01). The Regional Treatment Plant has recently been upgraded and has expanded capacity from 5,000 PE (population equivalent) to 10,000 PE.

A pre-connection enquiry (PCE) form was submitted to Irish Water (IW) which addressed the proposed wastewater discharges (and water demand) for the proposed development. IW provided a confirmation of feasibility (CoF; IW Reference CDS20003735) for the development on 22 September 2020. The CoF also specifies that upgrades are required to the existing foul drainage network to which the proposed development will discharge, stating:

“The existing wastewater network will require upgrades to cater for the additional proposed load. The upgrade will involve upsizing of between 300 and 1000 meters of existing 225mm sewer along the public road. It is not expected that 3rd party permissions will be required outside the requirements for a road opening licence. The exact details of this upgrade can be agreed at connection application stage.”

The Applicant acknowledges the commentary on the upgrades required. It will be under the remit and control of Irish Water to implement the upgrade works as part of the Applicant's connection application process, and as such, the CoF does not preclude the lodgement of this SHD planning application to An Bord Pleanála. A Statement of Design Acceptance has also been received from Irish Water and is included at Appendix D of the Engineering Services Report accompanying this application prepared by CS Consulting.

12.4.5 Water Supply

The current site is not developed and as such it does not have a positive connection into the local watermain network. The site is located adjacent to the regional Irish Water reservoir which currently supplies Ardee.

The proposed watermain network system has been designed in accordance with the specifications and requirements of Irish Water. The subject development's potable water supply network has been designed to be connected into that of the adjacent permitted development (LCC Refs. 10/174 and 19/336) to the west, which is currently under construction. The proposed watermain infrastructure and routing plan is shown on ARDEECSC-00-XX-DR-C-1003 Watermain Layout included with the planning application documents.

It is not anticipated that any demand from the proposed development on water supply will affect the ability of any existing or future developments in the area to access water through this water supply. As noted in Section 12.4.4, a PCE form was submitted to IW which addressed water demand (and wastewater discharges) for the proposed development. IW provided a CoF (IW Reference CDS20003735) for the development on 22 September 2020. A Statement of Design Acceptance has also been received from IW.

12.5 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

12.5.1 Construction Phase

Power and Electrical Supply

During construction, contractors will require power for heating and lighting of the site and their onsite construction compound. The power requirements will be relatively minor. It is proposed that a temporary power supply from the National Grid be established for the construction phase.

Telecommunications

Telecommunications including fibre required during the construction phase will be provided via a temporary mobile connection.

Surface Water and Foul Drainage Infrastructure and Water Supply

Welfare facilities (canteens, toilets etc.) will be required for the construction staff. Portable toilets will be provided onsite for construction staff.

A temporary connection to the mains water supply will be established for the construction phase. The water demand during the construction phase is not expected to be significant enough to affect existing pressures. Approval for temporary connections to the water supply will be sought from IW by the contractor.

If any stormwater collects in the excavations during construction, it will need to be discharged to sewer. Any discharge water will be treated using a siltbuster or similar to removed suspended solids prior to discharge.

12.5.2 Operational Phase

Power and Electrical Supply

As stated in Section 12.4.1, the power supply for the proposed development will be provided via an extension of the existing power supply infrastructure currently in place and under construction for the permitted residential development to the west of the site. Two new ESB sub stations are required to cater for the electrical requirement of the residential development, the substations have been designed into the proposed residential scheme. A formal application to confirm the nature of the ESB supply is made once the formal address of the residential development is agreed with LCC.

As per the *Building Energy Report* prepared by MANDE Consulting Engineers, which has been submitted with the documents for the planning application, the proposed development will be constructed to the high building standards and will provide a sustainable, energy efficient development for future occupants.

Telecommunications

As detailed in Section 12.4.2, The telecommunication infrastructure for the proposed development site will require an extension of the existing infrastructure currently in place and under construction for the permitted residential development to the west of the site.

Surface Water Infrastructure

Surface water will be collected in newly constructed storm water drainage network.

The proposed development is to retain storm water volumes predicted to be experienced during extreme rainfall events. This is defined as the volume of storm water generated during a 1 in 100-year storm event increased by 20% for predicted climate change factors. The attenuation volume requirement has been calculated by CS Consulting at 2,999m³ for the 1 in 100-year storm event. It is proposed to locate 4 no. Stormtech attenuation systems in different areas of the development. Please refer to CS Consulting Drawing ARDEE-CSC-00-XX-DR-C-1002 Drainage Layout, submitted with the planning application, for drainage details.

Discharge of attenuated surface water will be restricted to pre-development (greenfield) run-off rates. The equivalent greenfield runoff rate has been calculated by CS Consulting as 2.07 l/s/ha. The outfall into the public system will be into the adjacent storm sewers or into the River Dee's tributary. As noted in Section 12.4.3, the site has an existing open channel water course which is a tributary of the River Dee. It is proposed to re-align this water course to aid in the most sustainable use of the site to provide the required housing densities for the subject site area. The stream's hydraulic conveyance will be maintained and OPW hydraulic requirements (Section 9 Application) applied for post planning.

The proposed development will incorporate Sustainable Urban Drainage System (SuDS) Measures in the form of low water usage sanitary appliances, 'Water-butts' to retain rainwater for re-use for landscaping and maintenance purposes, and permeable paving for car-parking bays.

Further detail on the surface water drainage system and the basis of its design is provided in the *Engineering Services Report*, prepared by CS Consulting, which accompanies the planning application. Surface water is described further in this report in Chapter 6 (Water).

Foul Drainage Infrastructure

The proposed development will require a new separate drainage network to collect and convey the effluent generated by the proposed development. The drainage network for the proposed development has been designed in accordance with:

- The Regional Code of Practice Drainage Works;
- The Greater Dublin Strategic Drainage Study, and;
- Irish Water Code of Practice for Wastewater Infrastructure.

The drainage network for the development will be in accordance with Part H of the Building Regulations and to the requirements and specifications set out in the Irish Water Code of Practice for Wastewater.

The proposed foul network drainage system has been designed to drain into the granted foul drainage network associated with the adjacent permitted developments (LCC Refs. 10/174 and 19/336), located to the west of the proposed development site.

All effluent generated in Ardee, including that from the proposed development, is conveyed to the Regional Wastewater Treatment Plant (EPA Licence Number D0117/01). The Regional Treatment Plant has recently been upgraded and has expanded capacity from 5000 PE (population equivalent) to 10,000 PE.

The project engineers, CS Consulting, have calculated that the daily wastewater discharge for the proposed development once operational will be 1.435 litres per second (l/s) average flow and 8.610l/s peak flow, with a total wastewater discharge from the proposed development of 123.98m³ per day.

A pre-connection enquiry (PCE) form was submitted to Irish Water (IW) which addressed the proposed wastewater discharges (and water demand) for the proposed development. IW provided a confirmation of feasibility (CoF) for the development on 22 September 2020 (IW Reference CDS20003735). The CoF also specifies that upgrades are required to the existing foul drainage network to which the proposed development will discharge, stating:

“The existing wastewater network will require upgrades to cater for the additional proposed load. The upgrade will involve upsizing of between 300 and 1000 meters of existing 225mm sewer along the public road. It is not expected that 3rd party permissions will be required outside the requirements for a road opening licence. The exact details of this upgrade can be agreed at connection application stage.”

The Applicant acknowledges the commentary on the upgrades required. It will be under the remit and control of Irish Water to implement the upgrade works as part of the Applicant’s connection application process, and as such, the CoF does not preclude the lodgement of this SHD planning application to An Bord Pleanála. A Statement of Design Acceptance has also been received from IW.

Further detail in relation to wastewater emissions is presented in the CS Consulting *Engineering Services Report*. Sewage and wastewater treatment are described further in this report in Chapter 6 (Water).

Water Supply

Water is required for residential needs such as cleaning, general potable supply for drinking and sanitary needs. The proposed watermain network system has been designed in accordance with the specifications and requirements of Irish Water. The proposed potable water network has been designed to be connected into the granted potable water network associated with the adjacent permitted developments (LCC Refs. 10/174 and 19/336), located to the west of the subject site. The design requires a peak water demand of up to 6.516l/s. As noted in the previous section and in the *Engineering Services Report*, a CoF has been received from IW which addressed water demand for the proposed development.

Further detail in relation to water supply is presented in the CS Consulting *Engineering Services Report*.

12.6 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

12.6.1 Construction Phase

Power and Electrical Supply

During construction, contractors will require power for heating and lighting of the site and their onsite accommodation. In addition, some on site equipment/plant will require power.

A construction compound, including a materials and equipment storage area, a site office, and staff welfare facilities will be established for the construction phase. Electricity will be provided to the site via national grid. The power requirements for the construction phase will be relatively minor and therefore the power demand for the construction phase would have a potential short term imperceptible impact.

There are no perceptible impacts associated with power supply for the proposed development for the construction phase.

Telecommunications

Telecommunications including fibre required during the construction phase will be provided via a mobile connection.

There are no potential impacts associated with telecommunications for the proposed development for the construction phase.

Surface Water Infrastructure

The surface water connection works will be entirely within the permitted and proposed site boundaries, it is not anticipated that this would have any potential offsite impact.

Run-off water containing silt will be contained on site (using silt traps and oil inceptors) to ensure adequate silt removal.

As detailed in Chapter 6 (Water), with the implementation of the construction mitigation measures, as described in Chapter 6, no negative residual impacts to water quality are anticipated.

Foul Drainage Infrastructure

Welfare facilities (canteens, toilets etc.) will be required for the construction crew. Portable toilets will be provided onsite for construction staff.

Prior to approval of the temporary connection for foul water drainage to a public watermain it will be ensured that there is capacity for the foul water drainage from the proposed development. It not anticipated that the connection to this sewer would have any offsite impact.

There are no potential impacts associated with wastewater management for the proposed development for the construction phase.

Water Supply

A temporary connection to the mains water supply will be established for the construction phase. The demand during the construction phase is not expected to be significant enough to affect existing pressures.

The proposed development will be connected to a 150mm internal diameter MDPE watermain (SDR17 180mm outside diameter) and this shall be connected into the watermain associated with the adjacent permitted developments (LCC Refs. 10/174 and 19/336). The proposed network connection will be metered, with associated hydrants and valves as per Irish Water requirements. As the connection works will be approved to ensure there is capacity for water supply to the proposed development, it not anticipated that this would have any perceptible offsite impact.

12.6.2 Operational Phase

Power and Electrical Supply

As detailed in Section 12.5.2, the power supply for the proposed development will be provided via an extension of the existing power supply infrastructure currently in place and under construction for the permitted residential development to the west of the site. Two new ESB sub stations are required to cater for the electrical requirement of the residential development, the substations have been designed into the proposed residential scheme. A formal application to confirm the nature of the ESB supply is made once the formal address of the residential development is agreed with LCC.

As per the *Building Energy Report* prepared by MANDE Consulting Engineers, which has been submitted with the documents for the planning application, the proposed development will be constructed to the high building standards and will provide a sustainable, energy efficient development for future occupants.

There are no potential impacts associated with power and electrical supply for the proposed development for the operational phase.

Telecommunications

There is sufficient capacity available in the network to accommodate the development, and as such there are no potential impacts associated with telecommunications for the proposed development for the operational phase.

Surface Water Infrastructure

As detailed in Section 12.5.2, it is proposed to collect the surface water runoff from the proposed development in a newly constructed storm water drainage network.

The proposed development is to retain storm water volumes predicted to be experienced during extreme rainfall events. This is defined as the volume of storm water generated during a 1 in 100-year storm event increased by 20% for predicted climate change factors.

Discharge of attenuated surface water will be restricted to pre-development (greenfield) run-off rates.

The proposed development will incorporate Sustainable Urban Drainage System (SuDS) Measures in the form of low water usage sanitary appliances, 'Water-butts' to retain rainwater for re-use for landscaping and maintenance purposes, and permeable paving for car-parking bays.

The potential impact associated with surface water for the operational phase is long-term, neutral and imperceptible.

Foul Drainage Infrastructure

As discussed in Section 12.5.2, it is proposed to collect the foul sewerage from the proposed development and discharge into the granted foul drainage network associated with the adjacent permitted developments (Ref. 10/174 and 19/336), located to the west of the proposed development site. This foul drainage will ultimately discharge to the Ardee Regional Wastewater Treatment Plant (EPA Licence Number D0117/01). If insufficient capacity is available in the public infrastructure, there is potential for increased levels of pollution in receiving waters, however, this will not

arise as there is sufficient capacity and IW have confirmed feasibility of the connection as addressed in Sections 12.5.2 and 12.9.2.

The potential impact associated with foul drainage for the operational phase is long-term, neutral and imperceptible.

Water Supply

The water supply will be sourced from mains water supply via the 150mm internal diameter MDPE watermain (SDR17 180mm outside diameter) that will connect to the watermain currently under construction on the west site. If insufficient pressure is available in the public watermains network to accommodate the demand, existing customers in the area may experience a drop in water pressure below the service level required. However, this will not arise as addressed in Section 12.9.2.

The potential impact associated with water supply for the operational phase is long-term, neutral and imperceptible.

12.7 POTENTIAL CUMULATIVE IMPACTS

This section considers the potential cumulative impacts or effects on the environment of the proposed development with other existing, planned and permitted developments in the locality. These developments include the parent permission at Phase 1-3 of Bridgegate (permitted under Louth County Council Reg. Ref.: 10174; ABP Ref: PL15.238053 amended under permissions Reg. Refs.: 19336, 19353, 19549, 19875 and 211475) (under construction to the west) for 155 no. residential units, community building, crèche and public park. The proposed development overlaps the boundary of the parent permission at the western boundary and will supersede granted development in this area which consists of 31 no. dwellings, crèche and community building and public open space. This will equate to a total of 396 no. dwellings in the overall Bridgegate development upon completion.

Separate Irish Water upgrade works are needed to facilitate development in general in Ardee, including the subject lands, but do not form part of this application. The replacement / upsizing of the sewerage supply by Irish Water to facilitate the proposed development would require works to the public road will involve the excavation of the existing pipeline and surround along the length of its route and will be replaced with upgraded pipelines with granular fill surrounding it.

Cumulative impacts or effects are changes in the environment that result from numerous human-induced, small-scale alterations. Cumulative impacts can be thought of as occurring through two main pathways: first, through persistent additions or losses of the same materials or resource, and second, through the compounding effects as a result of the coming together of two or more effects.

12.7.1 Construction Phase

The proposed development entails minimal use of material assets during construction.

12.7.2 Operational Phase

Once operational, the proposed development will result in minimal impact on surface water, foul drainage and water infrastructure. The proposed development will connect to the surface water, foul drainage and water supply infrastructure for the permitted development and the requirements for the proposed development have already been considered in terms of the design of the infrastructure for the permitted development (refer to the *Engineering Services Report* prepared by CS Consulting).

The Applicant has engaged with IW to ensure that there is sufficient capacity to cater for the water supply and wastewater for the proposed and permitted development. As noted in the *Engineering Services Report* prepared by CS Consulting, a PCE form was submitted to IW which addressed water and wastewater demand for these developments. IW provided a CoF for the proposed development on 22 September 2020 (IW Reference CDS20003735) which confirms that a foul water and water supply connection to IW is feasible. A Statement of Design Acceptance has also been received from IW.

Based on the above, it is predicted that the cumulative impact of the Proposed Development with other permitted, planned and existing developments is considered to be short-term and not significant during the construction phase and long-term and not significant during the operational phase.

12.8 'DO NOTHING' IMPACT

If the proposed development did not proceed, there would be no use of material assets at the site. As such, there would be a neutral effect on the environment.

12.9 MITIGATION MEASURES

12.9.1 Construction Phase

Construction of the proposed development will require connections to water supply and drainage infrastructure, power, telecommunications and to the existing road network. There will also be a requirement to upgrade connections to the IW network outside the permitted and proposed site to the west of the site following an agreement with IW.

Ongoing consultation with LCC, Irish Water, Eirgrid, ESB and other relevant service providers within the locality and compliance with any requirements or guidelines they may have will ensure a smooth construction schedule without disruption to local and business community.

Power and Electricity Supply

The power demand for the construction phase will be relatively minor and the connection works are entirely within permitted and proposed site boundaries, so it is not anticipated that this would have any potential offsite impact.

The excavation of trenches within the vicinity of existing electrical services will be carried out in consultation with ESB Networks to ensure there is no impact on existing users.

Once the construction of the unit substations is completed, ESB Networks will be mobilised to complete the commissioning in accordance with the ESB Network requirements. There are no likely significant effects as a result of commissioning.

Telecommunications

The telecommunications will be extended from the permitted development to accommodate the proposed development. As these works are entirely within permitted and proposed site boundaries, it not anticipated that this would have any potential offsite impact.

Strict quality control measures will be undertaken while laying telecommunications cables.

Surface Water Infrastructure

Run-off water containing silt will be contained on site (using a silt trap and oil inceptor) to ensure adequate silt removal. The works contractor will be obliged to put best practice measures in place to ensure that there are no interruptions to service in existing surface water sewers. It is not anticipated that there will be any interruptions to service in existing surface water sewers, but should interruptions be anticipated, they will be agreed in advance.

Strict quality control measures will be undertaken while laying pipes to minimise or eradicate infiltration (where existing water in the ground enters the surface water infrastructure) and ex-filtration (where water in the surface water infrastructure escapes into the ground).

Foul Drainage Infrastructure

Portable toilets will be provided for construction staff.

Prior to temporary connection of the foul drainage to the public network, approval will be given to ensure there is enough capacity in the public network for the proposed development's foul water discharge. It is then not anticipated that this would have any offsite impact.

The works contractor will be obliged to put a number of measures in place to ensure that there is no impact on the public network during the construction works. Foul drainage for the proposed development will be in accordance with the Building Regulations Technical Guidance Document H for design and construction.

Strict quality control measures will be undertaken while laying pipes to minimise or eradicate infiltration and ex-filtration.

Water Supply

A temporary connection will be put in place for the construction phase. As the connection works are approved to ensure there is capacity within the public watermain, it not anticipated that this would have any potential offsite impact.

The works contractor will be obliged to put best practice measures in place to ensure that there are no interruptions to service from the public watermain. It is not anticipated that there will be any interruptions to service from the public watermain, but should interruptions be anticipated, they will be agreed in advance.

Strict quality control measures will be undertaken while laying pipes to minimise or eradicate infiltration and ex-filtration.

12.9.2 Operational Phase

Power and Electricity Supply

As detailed in Section 12.5.2, the power supply for the proposed development will be provided via an extension of the existing power supply infrastructure currently in place and under construction for the permitted residential development to the west of the site. Two new ESB sub stations are required to cater for the electrical requirement of the residential development, the substations have been designed into the proposed residential scheme. A formal application to confirm the nature of the ESB supply is made once the formal address of the residential development is agreed with LCC.

As per the *Building Energy Report* prepared by MANDE Consulting Engineers, which has been submitted with the documents for the planning application, the proposed development will be constructed to the high building standards and will provide a sustainable, energy efficient development for future occupants.

Telecommunications

There is sufficient capacity available in the area network for the proposed development. Therefore, no remedial or mitigation measures are required in relation to telecommunications.

Surface Water Infrastructure

The surface water drainage system for the proposed development incorporates runoff control in the form of attenuation, which will restrict discharge from the development to the allowable greenfield runoff rate of 2.07l/s/ha. The attenuation storage is provided via 4 no. Stormtech attenuation systems. These Sustainable Drainage Systems (SuDS) measures will prevent increase in surface water flow offsite. The allowable greenfield runoff rate has been established by the project engineers, CS Consulting, using the methodology set out in the *Engineering Services Report*.

Foul Drainage Infrastructure

As discussed in Section 12.5.2 above, IW have provided a CoF for the wastewater requirements for the development (which are detailed in the *Engineering Services Report* prepared by CS Consulting, which accompanies the planning application) can be accommodated, subject to application.

Foul drainage for the proposed development will be in accordance with the relevant standards for design and construction, including the Irish Water Code of Practice for Wastewater Infrastructure, The Building Regulations Technical Guidance Document (TGD) 'Part H' & the Regional Code of Practice for Drainage Works. A Statement of Design Acceptance has also been received from IW.

No remedial or mitigation measures are required in relation to foul drainage infrastructure.

Water Supply

As discussed in Section 12.5.2 above, IW have provided a CoF for the water requirements for the development (which are detailed in the *Engineering Services Report* prepared by CS Consulting, which accompanies the planning application) can be accommodated, subject to application. No remedial or mitigation measures are required in relation to water supply.

12.10 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

12.10.1 Construction Phase

Power and Electricity Supply

Power for the construction phase will be made available via the national grid.

The predicted impact will be short-term, neutral and imperceptible for the construction phase.

Telecommunications

The predicted impacts associated with telecommunications for the Proposed Development for the construction phase will be short-term, neutral and imperceptible for the construction phase.

Surface Water Infrastructure

The works contractor will ensure appropriate actions are undertaken to ensure that there are no interruptions to service in public surface water sewers and private drains. It is not anticipated that there will be any interruptions to service in public surface water sewers and private drains, but should interruptions be anticipated, they will be agreed in advance.

Strict quality control measures will be undertaken while laying pipes to minimise or eradicate infiltration (where existing water in the ground enters the surface water infrastructure) and ex-filtration (where water in the surface water infrastructure escapes into the ground).

The predicted impact will be short-term, neutral and imperceptible for the construction phase.

Foul Drainage Infrastructure

As the construction works are entirely within the permitted and proposed site boundaries, it is not anticipated that this would have any offsite impact. The works contractor will put appropriate measures in place to ensure that there are no impacts on the public network.

Foul drainage for the proposed development will be in accordance with the Building Regulations Technical Guidance Document H for design and construction.

Strict quality control measures will be undertaken while laying pipes to minimise or eradicate infiltration and ex-filtration.

The predicted impact will be short-term, neutral and imperceptible for the construction phase.

Water Supply

A temporary connection will be put in place for the construction phase. As the connection works are preapproved for capacity, it is not anticipated that this would have any offsite impact. The works contractor will be obliged to put best practice measures in place to ensure that there are no interruptions to service from the public watermain. It is not anticipated that there will be any interruptions to service from the existing water main, but should interruptions be anticipated, they will be agreed in advance.

Strict quality control measures will be undertaken while laying pipes to minimise or eradicate infiltration and ex-filtration.

The predicted impact will be short-term, neutral and imperceptible for the construction phase.

Predicted Impact – Construction Phase

The implementation of mitigation measures detailed in Section 12.9.1 will ensure that the predicted impacts on the material assets described above will be short-term, neutral and imperceptible for the construction phase.

12.10.2 Operational Phase

Power and Electrical Supply

As detailed in Section 12.5.2, the power supply for the proposed development will be provided via an extension of the existing power supply infrastructure currently in place and under construction for the permitted residential development to the west of the site. Two new ESB sub stations are required to cater for the electrical requirement of the residential development, the substations have been designed into the proposed residential scheme. A formal application to confirm the nature of the ESB supply is made once the formal address of the residential development is agreed with LCC.

As per the *Building Energy Report* prepared by MANDE Consulting Engineers, which has been submitted with the documents for the planning application, the proposed development will be constructed to the high building standards and will provide a sustainable, energy efficient development for future occupants.

It is predicted that there will be a long-term, neutral, not-significant effect on power and electrical supply during the operational phase of the proposed development.

Telecommunications

Network capacity for the proposed development will be readily available via the fibre network installed for the permitted development (as described in Section 12.4.2). There are no predicted impacts associated with telecommunications for the proposed development for the operational phase.

Surface Water Infrastructure

The proposed development will incorporate SuDs. The project engineers, CS Consulting, have determined the allowable discharge rate from the site will be 2.07l/s/ha, which is the equivalent greenfield runoff rate for the site.

The predicted impact will be long-term, neutral and imperceptible for the operational phase.

Foul Drainage Infrastructure

As discussed in Section 12.5.2 above, IW have provided a CoF and Statement of Design Acceptance for the wastewater requirements for the development (which are detailed in the *Engineering Services Report* prepared by CS Consulting, which accompanies the planning application) can be accommodated, subject to application.

It is anticipated that no remedial or mitigation measures will be required in relation to foul drainage infrastructure. The predicted impact will be long-term, neutral and imperceptible for the operational phase.

Water Supply

As discussed in Section 12.5.2 above, IW have provided a CoF and Statement of Design Acceptance for the water requirements for the development (which are detailed in the *Engineering Services Report* prepared by CS Consulting, which accompanies the planning application) can be accommodated, subject to application.

It is anticipated that no remedial or mitigation measures will be required in relation to water supply infrastructure. The predicted impact will be long-term, neutral and imperceptible for the operational phase.

Predicted Impact – Operational Phase

The implementation of mitigation measures detailed in Section 12.9.2 will ensure that the predicted impacts on the material assets will be long-term, neutral and not significant.

12.11 RESIDUAL IMPACTS

The proposed development entails minimal use of material assets examined in this chapter (i.e. power and electrical supply, telecommunications, surface water infrastructure, foul drainage infrastructure and water supply) during construction. As per the assessment of impacts undertaken in this chapter, there will be no significant impact on material assets to the wider economy. The overall predicted residual impact of the proposed development can be classed as long-term and not significant with respect to material assets considered.

12.12 INTERACTIONS

Interactions are addressed in Chapter 15 of this EIA Report.

Adherence to the mitigation measures outlined in Section 12.9.1 and 12.9.2 will ensure that there are no significant impacts on material assets as a result of the construction or operational phases of the proposed development.

12.12.1 Population and Human Health

The Proposed Development will have an impact on material assets such as surface water drainage, water supply, wastewater drainage, power supply and road infrastructure. The individual chapters of this EIA Report (Chapter 10 (Material Assets – Traffic) and Chapter 12 (Material Assets - Utilities)) have assessed the capacities of the available infrastructure to accommodate the Proposed Development and the implementation of the mitigation measure proposed in Sections 10.9 and 12.9 of these chapters will ensure there are no residual negative impacts on the local population. The predicted effect is therefore imperceptible to not significant and neutral.

12.12.2 Hydrology

The Proposed Development will result in changes to surface water drainage, water supply and wastewater networks. However, a combination of mitigation measures to be implemented as detailed in Section 6.8 of Chapter 6 (Water), as well as the capacity already built into these networks, will ensure that these changes will result in a long-term, imperceptible and neutral impact.

12.13 DIFFICULTIES ENCOUNTERED IN COMPILING

There were no difficulties encountered during the production of this chapter of the EIAR.

13.0 CULTURAL HERITAGE & ARCHAEOLOGY

13.1 INTRODUCTION

This chapter, prepared by Donald Murphy (MA, MIAI) and Magda Lyne (MA, MIAI) of Archaeological Consultancy Services Unit Ltd, evaluates the likely impact, if any, which the proposed development at Bridgewater, Rathgory and Mulladrillen, Drogheda Road, Ardee, County Louth may have on the archaeological, architectural, and cultural heritage resource.

A Cultural Heritage, Archaeological and Architectural Assessment of the proposed development was undertaken in March 2021. It was prepared and based on an Archaeological Impact Assessment that included a geophysical survey of a part of the site. The assessment was carried out to ascertain the potential impact of the proposed development on the archaeological, architectural and historical resource that may exist within the area. It was undertaken by Donald Murphy (MA, MIAI) and Magda Lyne (MA, MIAI) of Archaeological Consultancy Services Unit Ltd.

13.2 STUDY METHODOLOGY

The assessment was carried out in line with the Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (Environmental Protection Agency, 2017) and the Framework and Principles for the Protection of the Archaeological Heritage (Department of Arts, Heritage, Gaeltacht and the Islands, 1999) and the Architectural Heritage Protection Guidelines for Planning Authorities (Department of Arts, Heritage and the Gaeltacht, 2011).

Figure 13-1 Location of the site with nearby Sites and Monuments Record sites and National Museum of Ireland Finds database



The study area comprises a c. 0.5 km radius around the proposed development site at Mulladrillen and Rathgory townlands. An Archaeological Impact Assessment (desktop study) was carried out by Magda Lyne (MA, MIAI) and Donald Murphy (MA, MIAI). It involved a literature review and consultation of various archaeological, historical and cartographical sources. It also included results of field inspection and Geophysical Survey of the possible anomaly identified. The latter was carried out by Donald Murphy (MA, MIAI) of Archaeological Consultancy Services Unit.

The sources listed below form the baseline information for the cultural heritage of the area.

13.2.1 Documentary Sources

For the purposes of this report, archaeology & cultural heritage is considered to include the following elements:

- Sites listed in the Sites & Monuments Record (SMR)
- Record of Monuments & Places (RMP)
- National Monuments
- Archaeological sites listed on the National Monuments Service website:
- Sites reported in the Excavations Database
- A list of archaeological Finds from Topographical files of the National Museum of Ireland
- Cartographic sources
- Any previously unrecorded sites and Tangible Cultural Heritage Assets
- A list of Architectural heritage structures (National Inventory of architectural heritage (NIAH))
- A list of protected structures (Louth County Development Plan 2021-2027)

The following sources were consulted in order to identify and map archaeological sites within and adjacent to the proposed development site:

- **THE SITES AND MONUMENTS RECORD (SMR) AND RECORD OF MONUMENTS AND PLACES (RMP)**
WWW.ARCHAEOLOGY.IE

A primary cartographic source for baseline data for the assessment was the consultation of the Sites and Monuments Record (SMR) and Record of Monuments and Places (RMP) for County Louth (*Figure 13-1*). All known recorded archaeological monuments are indicated on 6-inch Ordnance Survey (OS) maps and are listed in this record. The SMR/RMP is not a complete record of all monuments as newly discovered sites may not appear in the list or accompanying maps. In conjunction with the consultation of the SMR and RMP, the electronic database of recorded monuments which may be accessed on their website, was also consulted.

- **NATIONAL MONUMENTS**

List of Monuments covered by Preservation Orders and List of National Monuments in the ownership/guardianship of the Minister for Housing, Local Government & Heritage. National Monuments in the ownership/guardianship of the Minister for Housing, Local Government & Heritage are listed on the Department's website.

- **EXCAVATION DATABASE KNOWN AS EXCAVATION BULLETIN / WWW.EXCAVATIONS.IE**

The excavations database is an annual account of all excavations carried out under license. The database includes excavations from 1970 to present. This database was consulted as part of the desktop research for this assessment. It was carried out to establish if any archaeological excavations were carried out on or near the proposed development area.

- **THE TOPOGRAPHICAL FILES OF THE NATIONAL MUSEUM OF IRELAND**

The National Museum of Ireland's topographical files contains information pertaining to archaeological finds (mainly artefactual) and excavations in numerous townlands throughout the country, reported to the museum from the 1920s. While many of these findspots are not recorded monuments, they can provide an indication of archaeological activity in a townland and consequently add to the archaeological potential of an area.

- **CARTOGRAPHIC SOURCES**

A number of cartographic sources were also consulted as part of the desktop assessment, namely the Down Survey maps of the area (1656-8), the first (1834) and third edition (1908) OS maps and available aerial photography.

- **TANGIBLE CULTURAL HERITAGE ASSETS**

Townland boundaries are considered tangible cultural heritage assets. The townland system is of Gaelic origin, pre-dating the Norman invasion, and many townlands have names of Irish Gaelic origin. However, some townland names and boundaries come from Norman manors, plantation divisions, or later creations of the Ordnance Survey when many Irish names were translated into English. The confiscations of the mid-17th century saw the townland boundaries first recorded and described in the surveys. The townland boundaries were first depicted on the Down Survey Map of 1654-57, and the work of the Ordnance Survey saw them depicted on the mapping in more detail. Townland boundaries recorded for the first edition Ordnance Survey

mapping of the nineteenth century were then utilised as formal administrative units for the census and as the basic framework for Griffith's Valuation. These are often laid along wet ditches, rivers, streams, roads, walls or topographical features. The boundaries can take a variety of forms and may consist of hedgerows and/or trees, earthen and stone banks, and/or ditches, stone walls.

- **THE LOUTH COUNTY DEVELOPMENT PLAN 2021-2027**

It contains a list of Architectural Conservation Areas and a Record of Protected Structures for the County. The latter lists cultural heritage sites, buildings of historic, architectural, -cultural, scientific and/or artistic interest. These are protected by the Planning and Development Act 2000 (Part IV Architectural Heritage) (as amended).

- **THE NATIONAL INVENTORY OF ARCHITECTURAL HERITAGE**

It contains a record and evaluation of the post-1700 architectural heritage of Ireland as an aid in the protection and conservation of the built heritage. It provides the basis for recommendations of the Minister for Housing, Local Government and Heritage to the planning authorities for the inclusion of particular structures in their Record of Protected Structures (RPS).

13.2.2 Field Work

Fieldwork is a part of archaeological impact assessment. It requires a physical presence on site. To date, two such assessments took place in relation to the proposed site and included:

- Field Inspection
- Geophysical Survey

The Following were undertaken in order to further assess the site and inform the planning process:

- **FIELD INSPECTION**

In addition to the desktop study, a field inspection was conducted. Field inspection involves an examination of the site and includes visiting and walking the area to be developed and its immediate vicinity that might be impacted upon. The general terrain type and land usage is noted, alongside any features of archaeological or historical importance. Their current condition is also investigated and noted. Any suspected landscape anomalies are also visually inspected to determine the possibility of them being anthropogenic in origin. It seeks to identify current and previous land use and locate any archaeological or architectural heritage potential or items of cultural heritage interest on the site.

- **GEOPHYSICAL SURVEY**

Geophysical survey is used to create 'maps' of subsurface archaeological features. Features are the non-portable part of the archaeological record, whether standing structures or traces of human activities left in the soil. Geophysical instruments can detect buried features when their electrical or magnetic properties contrast measurably with their surroundings. In some cases, individual artefacts, especially metal, may be detected as well. Readings taken in a systematic pattern become a dataset that can be rendered as image maps. Survey results can be used to guide excavation and to give archaeologists insight into the patterning of non-excavated parts of the site. Unlike other archaeological methods, geophysical survey is not invasive or destructive.

13.3 THE EXISTING RECEIVING ENVIRONMENT (BASELINE SITUATION)

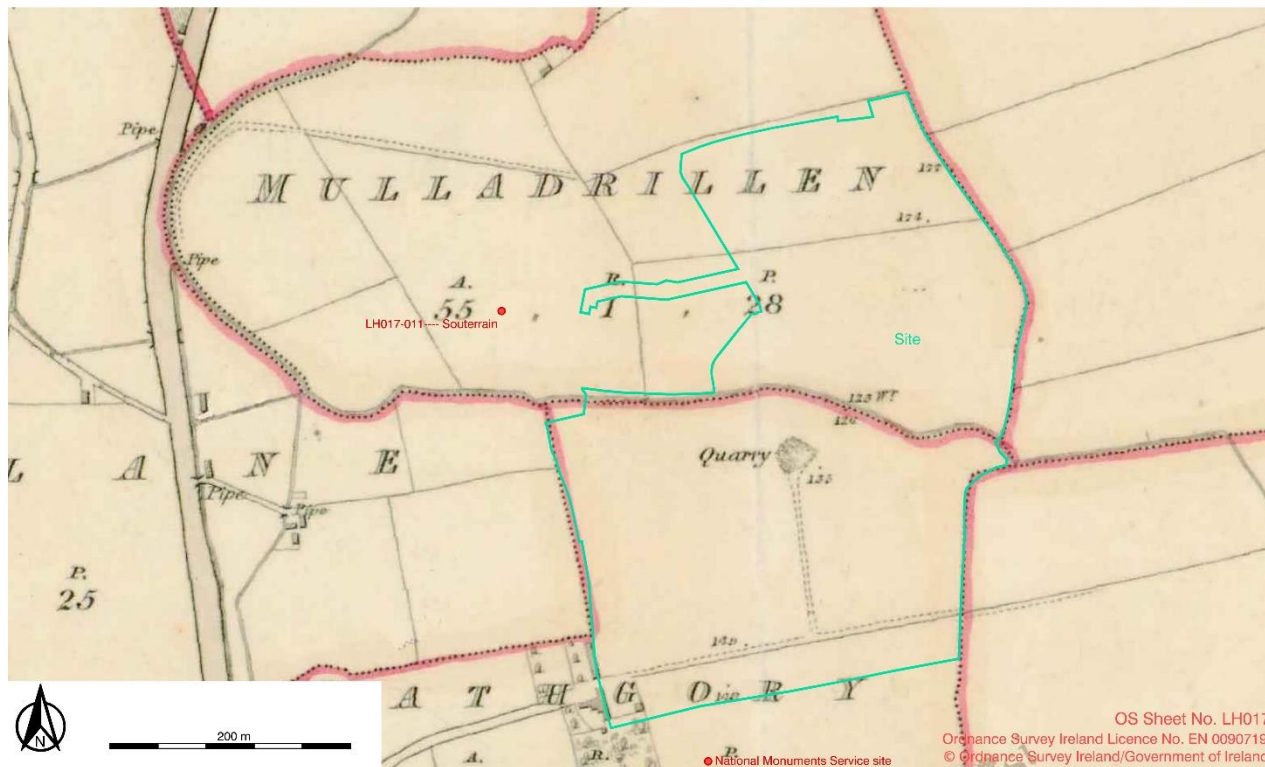
Archaeology is considered here to include all recorded monuments listed in the Record of monuments and Places (RMP) National Monuments (i.e., those in the ownership/Guardianship of the state), previously unrecorded sites, sites reported in the Excavation Database if not included in the RMP and find spots or sites listed in the Topographical Files.

13.3.1 Archaeological and Historical Background

The site is situated partially on the south side of a steeply sloping hill. It lies on the east side of the N2 at the southern fringe of Ardee town in Mulladrillen and Rathgory townlands. An examination of the Placenames Database of Ireland (www.logainm.ie) can reveal important information about an area's natural and cultural heritage. For example, Mulladrillen (Mullach Drislinn) comes from Irish mullach (also: mullaigh) and means hilltop. It was first noted in 1540 as 'Mullaghdrysselen' in Extents of Irish Monastic Possessions, 1540-1541, from Manuscripts in the Public Record Office, London, Edited by Newport B. White, M.A, but the townland name as we know it today was noted by John O'Donovan 1834 (Ordnance Survey Parish Namebooks), who also records that it was locally known as 'the wren's hill'/'hilltop of briers'. The name Rathgory (Ráth Guaire) derives

from Irish ráth (also: ráith), meaning ring-fort. The townlands name was first noted in the 1660s in the Books of Survey and Distribution, it was also noted by John O'Donovan 1834 (Ordnance Survey Parish Namebooks) as Gorey's rath, earthen fort the rath of Guaire Guaire-ainm pearsanta, which can translate as 'ath of bristles of a pig'.

Figure 13-2 Extract from the 1st Edition Ordnance Survey 6 inch map (1834)



The Down Survey map of 1654-1657 Barony of Atherdee shows the Ardee town and labels it as 'Atherdee', the site is located within an area marked as 'Part of Atherdee Towne land' and the map offers no more detail in relation to the site. Richardson's 1677 map 'The Commons of Atherdee Surveyed' shows Ardee town that extends to 'Mullaghdrillon' but does not show any topographical detail. On Taylor and Skinner's map of the County, published in 1778, the ridge of Mulladrillen is shown partially planted with trees and with one building indicated on the lower slope to the northwest. In Rathgorey townland, at the south-western edge of the development area, a house is shown, approached by an avenue from the Drogheda Road to the west. A lane or track continues east from the house to the eastern limit of the townland. The house is depicted on the 1st edition 6-inch OS map, surveyed in 1834 (Figure 13-2), with an orchard extending into the present development area, but is missing from the 1908 map (Figure 13-3). A 'Quarry' is shown on the 1834 map, close to the townland boundary between Rathgorey and Mulladrillen. It is indicated by hachures on the 1908 map and labelled 'Gravel pit'. In Mulladrillen the 1834 survey shows a large lane running east from the Drogheda Road to the summit of the ridge. On both; the 1834 and 1908 Ordnance Survey maps, the site is shown subdivided into two and three fields, respectively. Now there are only two large fields.

There is a total of two recorded monuments located within the townlands of Mulladrillen and Rathgorey; consisting of the previously mentioned souterrain LH017-011----, located c. 115m to the west of the site in Mulladrillen townland; and an earthwork LH017-094---- located 235m to the west of the site in Rathgorey townland.

The souterrain is listed as No 373 in Archaeological Inventory of County Louth (Buckley 1986) and Archaeological Survey of County Louth (Buckley, Sweetman 1991), the latter describes it as inaccessible. It is not depicted on the 1st Ordnance Survey Map of 1834, but it is labelled as 'Cave' on the 1908 map. The Cassini 1938 map depicts it as 'Souterrain'. The location of the monument was confirmed in 2009 during testing conducted by Kieran Campbell (09E0510). It was identified as roofless at the time of the discovery. It is now located within a protective buffer as the area around it is currently being developed. Souterrains dating from the Early Medieval Period (AD400-1100) are often found in association with settlements such as ringforts. The term 'souterrain' derives from the French sous terrain, meaning 'underground'. In archaeological terms, souterrains

are artificial underground structures cut into bedrock or, more commonly, built into dug-out trenches with drystone walling and large stone lintels. The primary function of souterrains seems to have been food storage as they maintain constant temperatures (c.10°C).

The earthwork LH017-094 located in Rathgory is not marked on either of the Ordnance Survey Maps; however, it is depicted as 'fort' on the estate map of 1810. It is now destroyed and under residential estate at Cherrybrook. However, a curve in the townland boundary between Rathgory and Stonylane can be still observed. It is listed in the Archaeological Inventory of County Louth (Buckley 1986) and Archaeological Survey of County Louth (Buckley, Sweetman 1991). The term 'earthwork' is used to describe a structure with no diagnostic features that would allow classification. It is usually an earthen structure in different sizes and shapes and may date to any period from prehistory.

It should also be mentioned that a polished stone axe (NMI Id. 1958:39) is noted within The National Museum of Ireland: Finds Database (2010). It was found in 1958, in a field located c. 280m to the east of the site. The stone axe was described as broken and classed as in the smaller group of axes due to its shape, it is however likely it was originally twice its current size (Cooney 1985).

Stone axes are the most well-known artefacts of the Neolithic period and were made primarily between 3800-2500BC but are also found in Mesolithic and Bronze Age contexts. It was estimated that at least 15 000 stone axes are known in Ireland (Cooney 1992). They appear to be in use up until 1200 BC. Ramsey (1995) suggests they were still in use in areas with short iron supply in relation to woodworking but also mentions their possible ritual role. They are also often found in the Early Christian context (AD500-1200) and are mostly associated with raths and ringforts. Ramsey suggests the polished stone axes were perhaps used in working the linen. He mentions a 19th-century tradition of using the polished stone axes by linen weavers as rubbing stones for working the linen.

Ardee has a rich archaeological and historical past, with the first mention of Ardee coming from the Tain Bó Cuailnge telling of Cuchulainn's last combat with Ferdia (warrior of Queen Maeve) at a river ford. Ath Fhirdia, or Ardee, on the River Dee is reputedly the Ford of Ferdia and its strategic importance continued into late medieval times.

There are few monuments that can be ascribed to the prehistoric period surviving above ground in the general vicinity of the site. However, sites of this period have come to light during development works in the wider area. To the east and south-west, within 3km of the site, there are standing stones at Barnaveddodge, Blakestown, Purcellstown and Hurlstone. A number of mounds and barrows, of likely prehistoric date, are located at Townparks on the east of Ardee, at Stabanna and at Barnaveddodge, this last possibly a megalithic tomb now destroyed. In 1999, Neolithic and Bronze Age sites were uncovered and excavated during the construction of the Ardee Link Road. It included a Neolithic house and Bronze Age cremation at Richardstown and fulachta fiadh, of Bronze Age date, at Cappocksgreen and Richardstown (Byrnes 1999; Seaver 2000, Duffy 2000). Isolated stray finds include Mesolithic flints found in plough soil at Ardee and Richardstown (Woodman 1978, 309), while The Irish Stone Axe Project has recorded stone axes from Ardee, Baltrasna and Richardstown (Cooney 1985, 88, 94). The National Museum holds a flint arrowhead, a bronze spearhead, a bronze axehead and a bronze horse pendant, all assigned to Ardee (Bradley 1984, 23).

EARLY CHRISTIAN PERIOD (400 A.D – 1169 A.D)

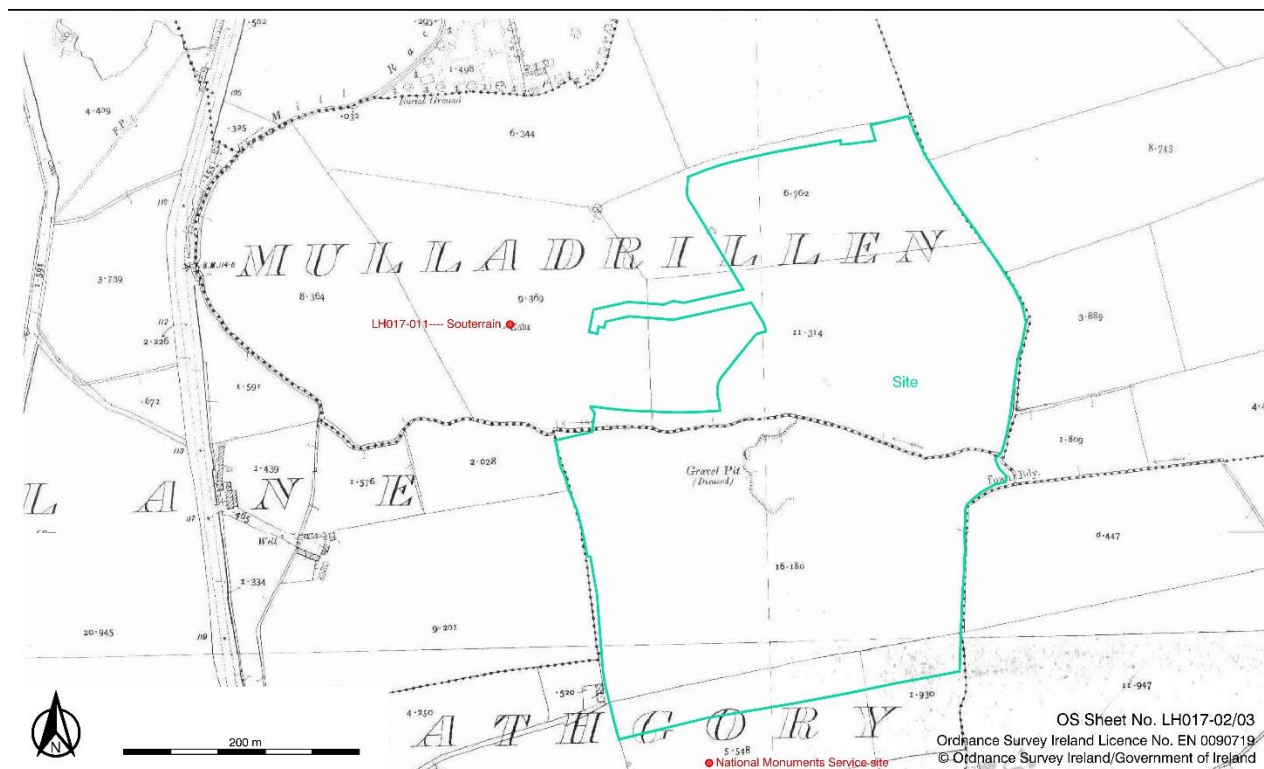
Ardee is renowned as an important fording place during the Early Christian Period and derives its name '*the Ford of Ferdia*' from the early historic legend of Cú Chulainn's combat with Ferdia. Annalistic sources tell that it is a meeting place for rival armies during the 10th to 12th centuries. However, there is no evidence of a settlement from this era (Bradley 1984, 3). Monuments of the period are, however, common in the wider Ardee area. The previously mentioned souterrain, Recorded Monument LH017-011, is situated on the southern slope of the ridge at Mulladrillen - within the related development site, see above - and was located in archaeological investigations undertaken in October 2009 (Campbell 2009). There are further souterrains located at Mullameelan, 0.8km to the south-west at Stickillin, 2.2 km to the east, at Broadlough and possibly at Millockstown. Other monuments of the period include enclosures or ringforts in Rathgory, Blakestown and Stonylane, and early churches at Stickillin and Kildemock Church in Millockstown townland.

MEDIEVAL PERIOD (1169 – 1550 A.D)

The site is situated c. 380m south of the southern boundary of the zone of the archaeological potential of the medieval town of Ardee (Recorded Monument LH017-101 'Town') as delineated on Sheet 17 of the Record of Monuments and Places: County Louth. Nothing survives of the medieval town wall, which enclosed an area of

25 hectares and only a small fragment remains of Cappock’s Gate, one of the six gates (Buckley and Sweetman 1991, 352). The topography and archaeology of the medieval town has been published by Bradley, arising from the O.P.W Urban Archaeology Survey (1984). The medieval town has its origins in the motte-and-bailey known as ‘Castle Guard’ in Dawsons Demesne, built by Gilbert Pippard in c. 1185. The parish church was in existence by 1197, and Bradley suggests that the town had developed northwards from the bridge along the axis of Castle Street and Market Street as far as the church by 1200. The town saw the foundations of an Augustinian monastery and a Carmelite monastery in 1207 and 1302, respectively. The next notable reference to the church describes its destruction at the hands of Edward Bruce in 1315 (Bradley 1984, 280). Remains survive of a medieval parish church of thirteenth-century date, now partly incorporated into the present St Mary’s Church of Ireland church (constructed in the nineteenth century).

Figure 13-3 Extract from the 3rd Edition Ordnance Survey 25 inch map (1908)



The first reference to the chantry college was in 1487, when it was described as ‘recently built’ (Bradley 1984, 286). Commissioned by Walter Verdon, the building was the former residence of the chantry chaplains employed in St Mary’s and later the residence of the church sexton until around 1875. The building is a three-storey rectangular structure of limestone and greywacke rubble with cut limestone quoins. Although altered in the sixteenth century, the building still retains its original barrel vault at ground-floor level with garderobe and murder hole at first-floor level (Buckley and Sweetman 1991, 264).

1550 A.D – PRESENT

The town contains two urban tower houses (a third lies outside the town walls). The more substantial of these is the courthouse at the southern end of Castle Street, perhaps one of the largest and best-preserved of the sixteenth-century castles. It survives as a rectangular four-storey structure with projecting crenelated towers and still contains features such as a barrel vault, garderobes, machicolation, wall walks and even a murder hole at the end of the entrance passageway (Buckley and Sweetman 1991, 343–45).

Richardson’s 1677 map, ‘The Commons of Atherdee Surveyed’ depicts the Ardee town as still walled on the west and north sides. In Ash Walk, there survives an earthen artillery bastion probably of 17th-century date (Bradley 1984, 13).

While keeping its medieval street pattern, the town of Ardee is today largely composed of buildings constructed in the 18th, 19th and 20th centuries. Principal buildings in the town are Ardee House (c, 1780), St Mary’s Church (1850) (Casey and Rowan 1993, 115-20).

13.3.2 National Monuments

The term ‘*National Monument*’ is defined by the National Monuments Act (1930) as being ‘*a monument or the remains of a monument the preservation of which is a matter of national importance by reason of the historical, architectural, traditional, artistic, or archaeological interest attaching thereto*’. The aforementioned Act states that the consent of the Minister is required for archaeological works at or near a national monument in the ownership or guardianship of the Minister or a local authority or to which a preservation order applies. The Minister is required to consult with the Director of the National Museum of Ireland in relation to such an application for consent.

No National Monuments are located on or within close proximity to the proposed development site. The nearest National Monument is located c. 7.6 kilometres (km.) to the north-east in Bawn townland. It consists of limestone rubble and greywackie built late medieval church with stone human head stop-mouldings probably of the 16th-century date (National Monument in State Guardianship No. 480, RMP LH015-004001-). The church is described in detail on the National Monuments Service website, a summary of which is transcribed below:

‘Built with limestone rubble and greywacke. Bellcote at W. Traceried window at E is a mixture of late medieval and nineteenth century work in limestone. S and N traceried windows are all of nineteenth-century limestone, but there are stone human head stop-mouldings on all of them which are late medieval, probably sixteenth-century in date. Another head appears over the apex of the arch of the E window. Church has undivided nave and chancel (ext. dims c. 12.6m E-W, c. 7.7m N-S) and is almost certainly fifteenth or sixteenth century in date, through it has later alterations and additions. The Episcopal Visitation of 1690 records: ‘Church not in repair since the wars...’ (Leslie 1908, 148-53). (CLAJ 1942, 107).

This is a National Monument, in state guardianship: No. 480.

13.3.3 Recorded Monuments

The Louth County Development Plan 2021-2027 recognises the statutory protection afforded to all recorded monuments under the National Monuments Legislation (1930-2004).

No recorded archaeological monuments, as listed in the Record of Monuments and Places (RMP) and shown on the associated maps, are located within the proposed development site boundary.

There are two monuments in the immediate environs of the site. These include Souterrain LH017-011----, located c. 115m to the west of the site, and earthwork LH017-094---- located 235m also to the west of the site. The site is also situated c. 380m south of the southern boundary of the zone of the archaeological potential of the medieval town of Ardee (Recorded Monument LH017-101 ‘Town’).

The surrounding landscape is also rich in recorded monuments, ranging in date from the prehistoric period to post-medieval times. The following is a list of the recorded monuments located in the environs of the site (*Table 13-1*). Where available, these descriptions are derived from the published Archaeological Inventory of County Louth (Moore 1987) and the Archaeological Survey of County Louth (Buckley, Sweetman 1991) but in some instances have been revised and updated on the National Monuments Service Archaeological Survey Database or are awaiting updating (<https://maps.archaeology.ie/historicenvironment/>)

Table 13-1 Recorded Monuments in the environs of the study area

RMP/ SMR No.	Class/ Site Type	Townland	Description
LH017-011----	Souterrain	Mulladrillen	Situated on side of high ridge according to IFC (Schools MSS 670, 13). Now inaccessible.
LH017-094----	Earthwork	Rathgory	Marked as ‘fort’ on an estate map of 1810. Now destroyed but townland boundary curves at this point (CLAJ 1982, 82).
LH017-101---	Historic town	Cappocks-green, Dawsons-Demesne,	The street pattern of Ardee is essentially linear with one broad street, formed by Market Street and Castle Street running north–south, to which a number of streets are aligned at right angles. Principal among these are Ash

RMP/ SMR No.	Class/ Site Type	Townland	Description
		Townparks (Ardee By)	Walk–Lambs Lane (Market House Lane) which form a sort of east–west axis making an intersection referred to in 1540 as the “great cross of the town”. Market Street, first mentioned as Main Street in 1344, would have functioned as the medieval market-place and the cross presently in St Mary’s Church appears to have stood here, perhaps indeed at the intersection mentioned above. It replaced a wooden market cross, referred to in the mid-fifteenth century. A lane known as the “Shepe Cawsey” is mentioned in 1484 and “Horslane” in 1483 but their locations are unknown (Bradley 1984).The burgage plot pattern survives well along both side sides of Market Street and there are a number of narrow lanes which may have once separated medieval houses. No evidence survives as to the nature of early medieval housing in Ardee but two splendid fifteenth century fortified houses are present in Market Street. These are known today as Pippard’s Castle and Hatch’s Castle, but both names appear to be of relatively recent origin. The former now functions as the Courthouse (LH017:10115; NGR 29616/29067) and this name is to be preferred in order to avoid confusion with the motte and bailey castle (LH017:01201; NGR 29712/29056) constructed by Gilbert Pippard at the end of the twelfth century. Irish Street, this extra-mural suburb which is shown by Richardson to have had a North Gate (Irish Gate; LH017:10102; NGR 29604/29101) and a portion of it, described as “a block of masonry and an arch”, was discovered during pipe-laying in the 1920s. It was found “about two feet under the present level, four yards into the roadway from the corner of the last house on the west side of the street”. It would appear from Richardson’s map that this area was unwallled but the long boundary wall on the west side of Irish Street suggests the former presence of defences. A thick wall forms the north end of the northernmost cottage on the west side of Irish Street and this may have formed part of such defences, but in the present state of knowledge it is impossible to be certain (Bradley 1984).
LH017-025----	Souterrain	Mullameelan	Drystone-built souterrain consisting of three passages and a sub-rectangular chamber, aligned E-W. The passages are at different levels, and connected by two step features. Total L c. 15m, aligned E-W. (CLAJ 1941, 70-1)
LH017-130----	Enclosure	Stonylane	Situated on a rise in a fairly level landscape. The faint cropmark of a circular area (diam. c. 25m) defined by a single fosse is visible on Google Earth (12/07/2013). It is also visible on Digital Globe (c. 2013) SW-N-SE. It was first reported by Jean Charles Caillere.
LH017-010----	Ringfort rath	Stonylane	Situated on top of a small natural rise. Circular area (int. diam. 30m) enclosed by earthen bank from SE-S-W. Bank survives as scarp (H 2m) on other sides, except on W where it rises 0.3m above the interior.
LH017-101022-	Religious house - Fratres Cruciferi	Townparks (Ardee By.)	Hospital of St John the Baptist, under the rule of St Augustine, said to have been founded by Roger Pipard c. 1207 (Gwynn and Hadcock 1988, 210). The hospital was apparently under the charge of sisters as well as brothers, and was well endowed by Roger Pipard. Its exact location is not known but it is likely to have been close to Moore

RMP/ SMR No.	Class/ Site Type	Townland	Description
			Hall. Human remains were discovered at Moore Hall in 1956 (CLAJ 1956, 462) and in 1963 (CLAJ 1963, 300). (Bradley 1984a, 285-6) (CLAJ 2003, 263-70)
LH017-101032-	Burial	Townparks (Ardee By.)	Disturbed human remains discovered in November 1946 underneath the floor of a grain store (Cahill and Sikora 2011, vol. 2, 496).

13.3.4 Previously Unrecorded Sites

No above ground previously unrecorded sites were noted within the proposed development area during the site walk-over survey conducted in July 2020.

13.3.5 Previously Archaeological Investigations

An Archaeological Impact Assessment for the site in question was prepared in July 2020 by Magda Lyne and Donald Murphy of Archaeological Consultancy Services Unit. It identified one possible faint cropmark, thought to represent a possible enclosure measuring c. 44m in diameter visible on satellite imagery (Google Earth - 27.05.19). Following consultation with the National Monuments Service the location of the suspected monument was subject to Geophysical Survey (*Section 13.3.11*). This was carried out under licence 20R0153 in August 2020. The survey suggests that the cropmark is likely of geological origin, and no clear indications of archaeological activity were identified (*Appendix 13.1*).

No additional previous archaeological investigations are listed within Excavation Bulletin (1970-2020) as located within the site. The review of the Excavations Bulletin has shown that while no additional previous archaeological investigations have been carried out within the proposed development area, a number of archaeological investigations have been carried out in the surrounding area over the past 30 years (*Table 13-2*). In general, the evidence suggests an area with significant prehistoric activity in the form of both habitation and funerary sites.

Table 13-2 Previous excavations in the environs of the site

Site	Licence No.	RMP/SMR No.	Site Type	Investigation Type
2018:877 - Mulladrillen & Rathgory, Louth	18E0171	LH017-011	Archaeological Activity	Monitoring and Excavation
2000: 0699 – Mulladrillen, Louth	00E0361	SMR 17:11	Vicinity of souterrain	Archaeological testing
2000:579 – Mulladrillen, Louth	09E0510	LH017-011	Souterrain	Archaeological testing
2002:1288 – Stonylane, Louth	02E1466	LH017:010	No archaeological significance	Archaeological monitoring
2001:832 - Moorehall, Ardee, Louth	01E1114	N/A	No archaeological significance	Archaeological testing
1993:153 - William St./College Lane, Ardee, Louth	93E0065	N/A	Possible medieval mill site	Archaeological testing

A number of assessments took place immediately adjacent and to the northwest of the site. This was carried out in relation to earlier phases (Phases 1-3) of this residential development (09E0510, 18E0171) and in advance of a proposed roadway (00E0361); the latter exposed nothing of archaeological interest. Archaeological testing conducted in October 2009 (09E0510) at the location of the souterrain (LH017-011) succeeded in exposing an unroofed portion of the souterrain passage. In addition to adjacent archaeological deposits within 15.0 – 20.0m of the souterrain. This led to monitoring and testing in the environs (18E0171) of the souterrain. This was carried out by Derek Gallagher of ACSU in 2018. During monitoring (Phase 1) in May

2018, four areas of archaeological significance were identified (Areas 1-4), spanning from the prehistoric period through to the post-medieval period. The resolved features included; a metallated trackway and mill race (Area 1), three fire pits, charcoal production pit and a stake hole (Area 2), seven pits including fire pits, cooking pit, charcoal production pit, possible storage pit, and also a figure-of-eight shaped cereal drying kiln, possible hearth, spread, five post holes, one stakehole, a field drain and a curvilinear feature (Area 3), and finally a burnt mound and post-medieval ditch (Area 4). The testing carried out during the second phase of this development did not identify any archaeological remains.

13.3.6 Protected Structures and the National Inventory of Architectural Heritage

The Louth County Development Plan 2021-2027 contains a record of all Protected Structures within the area, and in addition, the National Inventory of Architectural Heritage for County Louth was also consulted as it contains a list of architectural heritage structures.

There are no Protected Structures nor architectural heritage structures within the proposed development area. The nearest such structure is the Convent of Mercy Church Chapel (PRS ID LHS01-033F, NIAH Reg. Nr. 13823020), located c. 265m to the northwest of the site.

In the table below (*Table 13-3*) is a description of nearby Protected Structures as listed in the Record of Protected Structures – Louth County (Louth County Development Plan 2021-2027).

Table 13-3 Protected Structures and the National Inventory of Architectural Heritage

RPS ID	NIAH Reg. No.	Name	Description
LHS017-033F	13823020	Convent of Mercy Church Chapel, Convent of Mercy Chapel, Townparks, Ardee.	Attached stone chapel, built c. 1870. Two-bay aisle to north between main convent and square-plan two storey gabled stair tower to northwest, projecting single-storey gabled porch to south-west. The chapel stands as an integral part of the Convent of Mercy complex although it was not completed and dedicated until some seventeen years after the main convent building. The composition of the chapel sits well with the neighbouring buildings and the use of quality materials and craftsmanship in the masonry, stained glass and tiles enhance the character of the building
LHS017-033E	13823017	Convent of Mercy (former school) TOWNPARKS, Ardee.	Detached single-storey former school, built c. 1920, now in use as a community facility. Two four-bay buildings arranged in L-plan with flat-roofed corrugated-iron garage in south-east corner. This simple building forms part of the Convent of Mercy complex and is sited to the north of its imposing Gothic Revival neighbour. The building displays an interesting use of corrugated-iron which, together with the timber barges and half-boarded gables, creates a pleasing effect. Originally built to provide additional accommodation for the neighbouring school (which moved to new premises c. 1950).
Lhs017-033	13823018 & 13823019	Convent of Mercy, (convent/nunnery) Moore Hall, Townparks, Ardee.	Attached five-bay two-storey stone convent school, built c. 1855. This fine building is an integral part of the Mercy Convent complex and contributes to the quality of the group particularly with its tall, stepped tower. Designed by John Neville, the Gothic Revival detailing and adoption of high quality masonry and other materials add to the artistic interest. Formerly used as a primary school. the building played a vital role in the local community

13.3.7 Tangible Cultural Heritage Assets

The Down Survey Map of County Louth, Richardson's 1677 map '*The Commons of Atherdee Surveyed*' and Taylor and Skinner's map of County Louth 1778 were examined. The 1677 mentions '*Mullaghdrillon*'. No topographical detail in relation to the site is shown on examined pre-ordnance survey maps. The Ordnance Survey Maps of the area were also examined in order to identify boundaries/field divisions of significance. These show more detail in relation to the site. One of the boundaries running east-west within site has been identified as the townland boundary between Mulladrillen and Rathgory townland. This boundary is clearly depicted since and appears to remain unchanged and is recorded on both of the Ordnance Survey maps (*Figure 13-2* and *Figure 13-3*). Furthermore, the sites south-west and east boundary are respectively townland boundaries with Dawsonsdemesne and Baltrasna.

Residential development is proposed on both sides of the boundary, a pedestrian crossing and two roads Crossing Mulladrillen and Rathgory Townland Boundary. This boundary consists of a stream and mature trees and a hedgerow. An existing gap through the boundary located at its very west extent and within the site is currently being used to access the south portion of the site in Rathgory townland. While the stream will be retained, heavy landscaping of the boundary is proposed and will involve the removal of the existing boundary.

13.3.8 Topographical Files of the National Museum of Ireland

The topographical files of the National Museum of Ireland were consulted. No finds are recorded within the site, and no finds are listed in relation to Mulladrillen or Rathgory townlands. A number of objects are, however, recorded from townlands in the environs of the site. These relate to and reflect archaeological activity in the wider area.

Stone Age artefacts from the area include a flint arrowhead (NMI 1942:534) and polished stone axehead (NMI Id. 1958:39) found in 1958 in the field located c. 280m to the east of the site. The axehead is now in possession of the County Louth Archaeological and Historical Society. The axehead was from ground and polished tuff with slightly convex sides, both sides flattened, asymmetrical curving sharp edge with some chipping, the lower face has few flakes struck off, butt is damaged and incomplete, its profile is medium-thick, and section is oval and elongated (Cooney, 1985).

In 1830, a bronze spearhead (NMI 1929:1356) was found near the Fair Green along with a bronze horse pendant (NMI 1929:1357), while a bronze pin was discovered in a sandpit at Match's Quarry outside the town. From the medieval period, the files record the font of St. Mary's Church and human remains having been uncovered at a site outside the town and at Moore Hall on the site of the monastery and hospital of Saint John.

13.3.9 Cartographic Sources and Aerial Photography

CARTOGRAPHIC SOURCES

A review of available historic mapping for the area was carried out. It included pre-ordnance survey mapping and Ordnance Survey mapping. The pre-Ordnance survey maps included the Down Survey barony and parish maps (1654-7), Richardson's 1677 map '*The Commons of Atherdee Surveyed*' and Taylor and Skinner's map of the County Louth 1778 while the Ordnance Survey Mapping included the first (1834) and third (1908) editions of the Ordnance Survey maps.

Potential archaeological or cultural heritage features are marked on such maps and provide a useful resource in identifying sites, particularly if they no longer have any above-ground remains. No archaeological or cultural heritage features are shown within the proposed development site on the Down Survey map of the area (1654-7), while the 1778 map shows Ardee town that extends to '*Mullaghdrillon*'. Taylor and Skinner's map of County Louth 1778 shows the ridge of Mulladrillen partially planted with trees and with one building indicated on the lower slope to the northwest.

The Ordnance Survey Maps (1834 and 1908) depict more detail in relation to the site and its immediate environs. On the 1834 Ordnance Survey map (*Figure 13-2*), Rathgory and Mulladrillen townlands are depicted. At the south-western edge of the development area, a house is shown, approached by an avenue from the Drogheda Road to the west. A lane or track continues east from the house to the eastern limit of the townland. The house is depicted on the 1st edition 6-inch map, surveyed in 1834, with an orchard extending into the present

development area. It is missing from the 1908 map (*Figure 13-3*). A 'Quarry' is shown on the 1834 map close to the townland boundary between Rathgory and Mulladrillen. It is indicated by hachures on the 1908 map where it is labelled as 'Gravel pit'. In Mulladrillen the 1834 survey shows a large lane running east from Drogheda Road to the summit of the ridge.

The cartographic review of the Ordnance Survey maps of 1834 and 1908 shows that there has been a relatively little overall alteration to the field system within which the site of the proposed development is located since the early 19th century, apart from the removal of a number of internal divisions, and with the exception in recent times of the construction of the town reservoir and the general encroachment of housing developments in the wider area. On both the 1834 and 1908 Ordnance Survey maps, the site is shown subdivided into two and three fields, respectively. Currently, the site consists of two large fields.

AERIAL PHOTOGRAPHY ANALYSIS

Aerial photographic coverage of the proposed development area held by the Ordnance Survey (1995, 2000 and 2005) and Google Earth (2005-2020) were examined.

Figure 13-4 Cropmark, visible on Google Imagery 27.05.2019, subjected to the geophysical survey.



One particular image (Google Earth - 27.05.19) contained a possible faint cropmark suggestive of an enclosure measuring c. 44m in diameter (*Figure 13-4*). However, the area in question was subject to a geophysical survey (*Section 13.3.11*), that showed no clear indications of archaeological activity. It is likely that the cropmark represents either differential crop growth or is geological in nature.

In addition, the souterrain LH017-011 (located in the area adjacent to the site), is visible as a dark linear feature on the 1995 and 2000 Ordnance Survey aerial images.

As mentioned above, in some cases, the field boundaries seen on the historical mapping, which are no longer extant, could be seen as dark lines on the ground surface, particularly on the 2000 Ortho aerial photograph. The gravel quarry mentioned above is also quite apparent on the 1995 Ordnance Survey aerial imagery, while the ridge-top laneway can be seen to varying degrees on all the available aerial imagery.

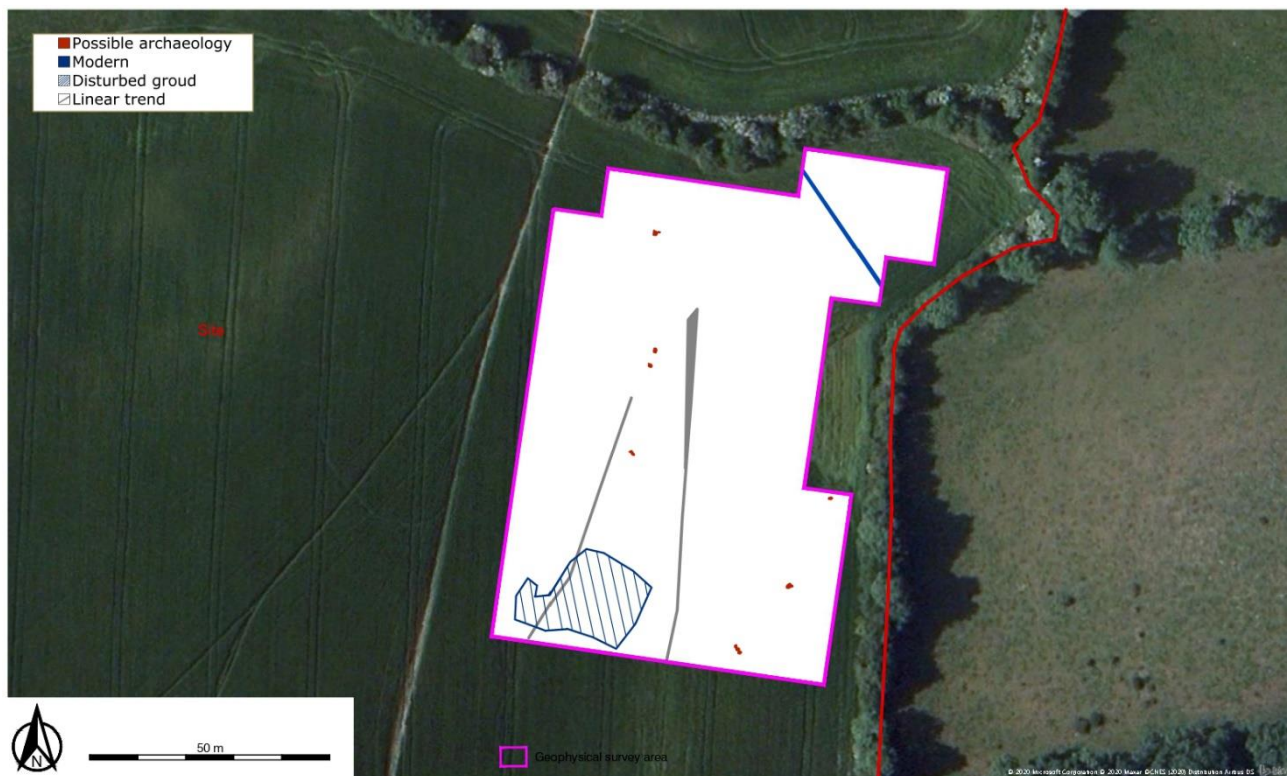
13.3.10 Field Inspection

The field survey of the site took place on the 3rd of July 2020 and was carried out by Donald Murphy. It noted that the site is located east and south-east of the Bridgewater Housing development, which is currently under construction. A souterrain (LH017-011) which location was confirmed during testing in 2009, is preserved *in situ* within a green space of the permitted Bridgewater development presently under construction and is located to the northwest of the current site. The proposed site comprises two large fields. The most northerly of which is located on top of an east-west running ridge with a steep slope to the south where it is bordered by a small stream. The southern field lies at the base of the ridge but rises gently to the south. Both fields are overgrown but were under crop until the commencement of the Bridgewater development. The southern field includes the site of an old gravel pit (now infilled) illustrated on the Ordnance Survey Maps. More than half of the southern field has been used as a soil tip for arisings coming from the Bridgewater development, with some smaller soil mounds in the north field. No structures or features of an archaeological nature were identified within the site.

13.3.11 Geophysical Survey

A geophysical survey was conducted by Donald Murphy and Robert Breen in August 2020 under Licence 20R0153 issued by the Department of Culture, Heritage and the Gaeltacht. The aim of the survey was to establish the presence/absence of the potential enclosure identified as a cropmark from satellite imagery (Google Earth - 27.05.19). The potential enclosure had no surface expression and was located in low lying arable land (*Figure 13-4*). The geophysical survey was conducted in the northeast corner of the large open field at the south end of the development area (ITM 696703, 789625).

Figure 13-5 Geophysical Survey Interpretation Results



A full detailed gradiometer survey was undertaken throughout the application area using a Bartington GRAD 601-2 dual-sensor fluxgate gradiometer system. A detailed survey was conducted with a sample interval of 0.25m and a traverse interval of 1m with variations in the magnetic field between -100nT to +107.834nT.

The survey identified a northwest-southeast aligned modern drain or service line in the northeast corner of the survey area. A couple of weak linear trends were also identified aligned north-south which may be associated with track marks, internal divisions, or drainage features. A number of isolated positive cut anomalies were also identified. These may represent pits, postholes or other archaeological cut features or may alternatively be

natural in origin i.e. as a result of tree throws, disturbed ground or stone sockets in the underlying subsoil (Murphy, Breen 2020).

An area of disturbed ground was located towards the south of the survey area. This may be due to recent groundworks or part of historical quarrying efforts made in the immediate vicinity. This geophysical survey failed to confirm the presence of any potential enclosure, and no clear indications of archaeological activity were identified (*Figure 13-5*).

A report detailing the geophysical survey was submitted to The Department of Culture, Heritage and the Gaeltacht and is attached *Appendix 13.1*.

13.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development area is located on a site that measures c. 13.03 hectares (c. 32 acres) within lands in the townlands of Rathgory and Mulladrillen, Ardee, Co. Louth. It is situated c. 0.7km of Ardee town centre, immediately east and adjacent to the Cherrybrook housing estate and east of N2 Drogheda Road.

An area adjacent to and northwest of the site is being developed as a residential estate (as part of Phases 1-3).

The proposed development is a Strategic Housing Development and is to consist of the construction of 272 no. residential units, creche and play area, community building and series of open spaces, including realigned watercourse and riparian corridor, access, car park landscaping and all associated infrastructure, including a public park.

A full project description is presented in Chapter 2 of the EIAR

13.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

13.5.1 Construction Phase Impacts

POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

The proposed development area is considered as having moderate archaeological potential. It is, therefore, possible that any future development of this site would have the potential to negatively impact previously unrecorded sub-surface features and deposits of an archaeological origin, should they be present.

PREDICTED DIRECT IMPACTS ON RECORDED ARCHAEOLOGICAL MONUMENTS

There will be no direct impacts on recorded archaeological monuments as no recorded monuments are located within the proposed development site. The nearest monument comprises of Souterrain LH017-011---- located c. 115m to the west of the proposed development site, and it will not be impacted in any way.

PREDICTED DIRECT IMPACTS ON KNOWN AND POTENTIAL ARCHAEOLOGICAL FEATURES

The proposed development will not impact any known archaeological features. However, it has the potential to impact previously unknown buried features of an archaeological nature should they exist. Should any archaeological remains exist within the site, the development has the potential to directly negatively impact on any identified sub-surface archaeology and would result in their destruction or partial destruction.

PREDICTED DIRECT IMPACTS ON PROTECTED STRUCTURES AND NATIONAL INVENTORY OF ARCHITECTURAL HERITAGE STRUCTURES

There are no structures located within the area to be developed, and no buildings were depicted on either of the Ordnance Survey Maps (1834, 1908). The nearest Protected Structure, listed within the Louth County Development Plan 2021-2027, is the Convent of Mercy Church Chapel (PRS ID LHS01-033F, NIAH Reg. Nr. 13823020), located c. 265m to the northwest of the site. It will not be impacted upon by the proposed development. There will be no impact on Architectural Heritage.

PREDICTED DIRECT IMPACTS ON THE TOWNLAND BOUNDARY

The site is located within two fields. The north field is located within the townland of Mulladrillen, whereas the south field is located in Rathgory townland. A townland boundary that traverses the site is still present. It is represented by mature trees, a hedgerow and a stream. Two crossings of the townland boundary, including an additional pedestrian crossing and significant landscaping, are proposed.

The proposed development will have a direct impact upon the townland boundary and will result in its removal.

PREDICTED INDIRECT IMPACTS

Indirect impacts here are those which may have a negative (or positive) effect on the archaeological landscape after the construction phase of the development (i.e. operational). Indirect impacts may include the visual impact on the surrounding archaeological landscape. The nearest recorded monument to the site comprises of Souterrain LH017-011---- located c. 115m to the west of the proposed development. The area directly adjacent to the souterrain is being currently developed. The introduction of the proposed development to the area, will result in a change to the general setting of this monument. Its immediate setting will remain unchanged. Therefore a slight to negligible indirect impact to the monument is noted.

13.5.2 Operational Phase Impacts

There will be no operational phase impacts on archaeology or cultural heritage features from the proposed development.

13.6 POTENTIAL CUMULATIVE IMPACTS

Phases 1-3 of the present residential development is under construction to the west of the application site. A Souterrain LH017-011---- located within the Phase 1 site was preserved in situ within an appropriate buffer zone. Archaeological investigations here identified a number of features and deposits of archaeological significance that were preserved by record (excavated). There is therefore a potential cumulative impact on any buried archaeological features that may or may not survive below ground.

13.7 'DO NOTHING' IMPACT

If the proposed development does not proceed, there will be no impact on the Cultural, Archaeological or Architectural Heritage of the site.

13.8 AVOIDANCE, REMEDIAL & MITIGATION MEASURES

13.8.1 Construction Phase

In order to mitigate the potential impact of the proposed development on potential archaeological remains and the townland boundary, the following measures shall be adhered to:

- An additional geophysical survey shall be carried out within the north field of the proposed development. Due to significant quantities of soil having been introduced to the site, and historic quarrying, a further geophysical survey within the south field is not recommended.
- This shall be followed by an intensive testing programme of the entire site, targeting anomalies identified and is required prior to any works in order to mitigate any potential impact on possible archaeology. It should be carried out by a licence eligible archaeologist in consultation with and under licence from the National Monuments Service of the Department of Housing, Local Government and Heritage.
- Wherever possible, the preservation in situ of any identified archaeological remains is the preferable option; however, where this is not possible, preservation by record in advance of construction is recommended. Should any archaeological remains be uncovered during test trenching, the appointed archaeologist shall consult with the Licensing Section of the NMS, and methodologies shall be agreed regarding their resolution/avoidance.
- Full provisions should be made for the resolution (full excavation) of any archaeological features/deposits that may be discovered in the course of the assessment, should that be deemed the most appropriate course of action.
- Adequate time and resources will be provided by the developer for the resolution of any archaeology identified within the development site, which will be directly impacted by groundworks. Time and resources will also be allowed for any post-excavation work and specialist analysis necessary following any archaeological excavation that takes place.
- A report shall be compiled on completion of the archaeological excavation and submitted to the relevant authorities.
- The townland boundary that traverses the proposed development shall be recorded by photograph and written description prior to any development proceeding.

13.8.2 Operational Phase

No mitigation measures relating to the archaeological, architectural and cultural heritage resource are deemed to be necessary during the operational phase of the proposed development.

13.9 RESIDUAL IMPACTS

The residual impacts are likely to be low or negligible if the recommended mitigation measures are implemented. The table below (*Table 13-4*) summarises the residual impacts of the proposed development on the archaeological landscape. Residual impacts are defined as the overall impact of the development on archaeology on the basis of implementing the mitigation measures recommended in this report.

Table 13-4 Summary of Residual Impacts

Potential Impacts	Mitigation Strategies	Residual Impacts
Construction Impacts		
Topsoil removal associated with development. Excavation of foundations and service trenches etc.	Geophysical survey of the north field and advance Archaeological testing of the entire site at pre-construction phase. Consultation with Licensing Section of National Monuments Service should any archaeological sites or features be uncovered.	Low
Removal of townland boundary between Rathgory and Mulladrillen	Survey, recording in advance of construction of townland boundary by a licensed archaeologist. Survey to include a written, drawn and photographic record.	Low
Impacts to recorded monuments - none	No mitigation required.	None
Impacts to protected structures and national inventory of architectural heritage structures - none	No mitigation required.	None

13.10 REINSTATEMENT

Not relevant.

13.11 INTERACTIONS

There will be no interactions between the cultural heritage assets and any of the other environmental factors (e.g., traffic & transportation; noise; air quality & climate; land, soils & geology; water; biodiversity, landscape & visual impact, and human health & population).

13.12 DIFFICULTIES ENCOUNTERED IN COMPILING

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

14.0 RISK MANAGEMENT FOR MAJOR ACCIDENTS AND/OR DISASTERS

14.1 INTRODUCTION

The 2014 EIA Directive (2014/52/EU) has updated the list of topics to be addressed in an EIAR and has included 'Risk Management' as a new chapter to be addressed. This chapter of the EIAR was prepared by Dualta Conway, H.Dip. Occupational Health and Safety, Grad. IOSH. Article 3 of the new EIA Directive requires that the EIA shall identify, describe and assess in the appropriate manner, the direct and indirect significant effects on population and human health, biodiversity, land, soil, water, air and climate, material assets, cultural heritage, and landscape deriving from (amongst other things) the *“vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned”*.

The Planning and Development Regulations 2001, as amended, Schedule 6 paragraph 2(h) indicate that it may be appropriate to furnish additional information in relation to the following:

“(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.”

This chapter identifies and assesses the likelihood and potential significant adverse impacts on the environment arising from the vulnerability of the proposed development to risks of major accidents and / or natural disasters. It considers whether the proposed development is likely to cause accidents and / or disasters and its vulnerability to them.

The purpose of the chapter is to ensure that the safety and precautionary measures necessary to protect the proposed development in the event of a major accident and / or natural disaster are identified and that appropriate mitigation measures are provided that would protect the environment in the event of such occurrences.

This chapter will identify the types of major accidents / natural disasters that the project is vulnerable to; whether major accidents or natural disasters and the responses to these give rise to significant adverse environmental impacts; the nature of these impacts and the measures needed to prevent or mitigate the likely adverse impact of such events on the environment

14.2 STUDY METHODOLOGY

The starting point for the scope and methodology of this assessment is that the proposed development has been designed and will be constructed in line with best practice and, as such, major accidents and / or natural disasters will be very unlikely. The identification, control, and management of risk is an integral part of the design and assessment process throughout all stages of a project lifecycle. For example, a Site Specific Flood Risk Assessment has been carried out by JBA Consulting and is submitted with this planning application. Mitigation measures to control risks associated with Construction Phase activities are incorporated from the EIAR into the Outline Construction Management Plan and the Construction & Environmental Management Plan.

The following sections set out the requirements as stated in the new EIA Directive and in the EPA draft Guidelines on the information to be contained in an Environmental Impact Assessment Report (EIAR). The scope and methodology presented is based on the new EIA Directive, the draft EPA guidelines, on other published risk assessment and on professional judgement of the consultants with this responsibility in the construction and operation of the proposed development. A risk analysis-based approach methodology which covers the identification, likelihood and consequence of major accidents and / or natural disasters has been used for the assessment. This type of risk assessment approach is an accepted methodology.

Recital 15 of the EIA Directive states that:

“In order to ensure a high level of protection of the environment, precautionary actions need to be taken for certain projects which, because of their vulnerability to major accidents, and/or natural disasters (such as flooding, sea level rise, or earthquakes) are likely to have significant adverse effects on the environment. For such projects, it is important to consider their vulnerability (exposure and resilience) to major accidents and/or disasters, the risk of those accidents and/or disasters occurring and the implications for the likelihood of significant adverse effects on the environment. In order to avoid duplications, it should be possible to use any relevant information available and obtained through risk assessments carried out pursuant to Union legislation, such as Directive 2012/18/EU.”

The intent of EIA directive is that a major accident and/or natural disaster assessment should be mainly applied to COMAH (Control of Major Accident Hazards involving Dangerous Substances) sites or nuclear installations. The proposed development in this instance is residential development on a greenfield site which when completed, will not give rise to ongoing significant risks in its operating environment.

The 2017 EPA Draft Guidelines on the information to be contained in an EIAR refer to major accidents and/or disasters in a number of sections:

Characteristics of the Project – the draft guidelines state that the project characteristics should include *“a description of the Risk of Accidents – having regard to substances or technologies used.”*

Impact assessment - the draft guidelines state that the impact assessment should include *“the risks to human health, cultural heritage or the environment (for example due to accidents or disasters)”*.

Likelihood of Impacts - the draft guidelines state the following:

“To address unforeseen or unplanned effects the Directive further requires that the EIAR takes account of the vulnerability of the project to risk of major accidents and / or disasters relevant to the project concerned and that the EIAR therefore explicitly addresses this issue. The extent to which the effects of major accidents and / or disasters are examined in the EIAR should be guided by an assessment of the likelihood of their occurrence (risk). This may be supported by general risk assessment methods or by systematic risk assessments required under other regulations e.g. a COMAH assessment.”

There are also a number of mechanisms which currently manage accidents outside of the EIA process. These would include the Outline Construction Management Plan and Construction & Environmental Management Plan which would deal with pollution risks during construction (See Chapters 5, 6 and 7 of the EIAR on Land & Soils, Water, and Air Quality and Climate) and risk of accidents during construction, including traffic accidents. The risk of flooding is dealt with in Chapter 6 - Water. The majority of the site is located within Flood Zone C, with a small part located within Flood Zone B. The SSFRA and Drainage Strategy ensure that flood risk is properly managed and mitigated against, with the proposed development contributing to reducing flood risk on site. Separately, the risk of fire is managed through the Fire Safety Certification process, which is an integral part of the design of the proposed development.

12.2.1 Site Specific Risk Assessment Methodology

This section identifies the potential of unplanned but potential events that could occur during construction and operation of the proposed development.

Risks are set out according to the classification of risk, taken from the Guide to Risk Assessment in Major Emergency Management (Department of the Environment, Heritage & Local Government, 2010), as follows:

Table 14.1 – Risk Classification

Table 2 - Classification of Likelihood

Ranking	Classification	Likelihood
1	Extremely Unlikely	May occur only in exceptional circumstances; Once every 500 or more years
2	Very Unlikely	Is not expected to occur; and /or no recorded incidents or anecdotal evidence; and /or very few incidents in associated organisations, facilities or communities; and / or little opportunity, reason or means to occur; May occur once every 100-500 years.
3	Unlikely	May occur at some time; and /or few, infrequent, random recorded incidents or little anecdotal evidence; some incidents in associated or comparable organisations worldwide; some opportunity, reason or means to occur; may occur once per 10-100 years.
4	Likely	Likely to or may occur; regular recorded incidents and strong anecdotal evidence and will probably occur once per 1-10 years
5	Very Likely	Very likely to occur; high level of recorded incidents and /or strong anecdotal evidence. Will probably occur more than once a year.

12.2.2 Hazard identification

The site is not in an area prone to natural disasters. Risks were reviewed through the identification of plausible risks in consultation with relevant specialists including CS Consulting Engineers, JBA Consulting Engineers, Ground Investigations Ireland and Altemar. Therefore, the risks set out below are considered the most relevant potential risks, with the likelihood identified from extremely unlikely (1) to very likely (5).

A risk matrix can be prepared against which the proposed development can be tested.

Table 14.2 – Risk Matrix

Likelihood Rating	Very likely	5					
	Likely	4					
	Unlikely	3					
	Very unlikely	2					
	Extremely Unlikely	1					
			Minor	Limited	Serious	Very Serious	Catastrophic
			1	2	3	4	5
			Consequence Rating				

Table 14.3 – Risk Likelihood

Category	Risk Factor Type	Likelihood
Weather	Storms, snow	3
Hydrological	Risk from flooding	2
Excavation work	Collapse	2
Road	Traffic accident	2
Industrial accident	General housebuilding construction	1
Explosion	General Construction materials no explosive products used	1
Fire	Hot works close to block and brick structures	3
Building Collapse	Structural failure during construction. There are no existing buildings and no demolition works.	1
Hazardous substance escape	General housebuilding construction products.	2
Pollution	Construction	3

The risks are then tested in terms of consequences. It should be noted that when categorising the Consequence Rating, the rating assigned assumes that all proposed mitigation measures and safety procedures have failed to prevent the major accident and/or disaster. In addition, Louth County Council have in place a 'Major Emergency Plan' which, if implemented as intended, will work to reduce the effect of any major accident or disaster.

The impact ratings are taken from the Guide to Risk Assessment in Major Emergency Management (Department of the Environment, Heritage & Local Government, 2010).

14.3 RECEIVING ENVIRONMENT

The surrounding context consists of a mix of residential and agricultural. 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. The closest Seveso site is the Red Barns, Drumcar Road, Dunleer, Co. Louth, which is approximately 11 kilometres from the subject site.

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"*.

14.4 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

12.4.1 Health & Safety/ Risks of Major Accidents and/or Disasters

12.4.1.1 Construction Phase

It is considered that the main risks associated with the proposed development will arise during the construction phase.

The construction phase of the proposed development may give rise to short-term impacts associated with construction traffic, migration of surface contaminants, dust, noise and littering. Secondary impacts may include resulting increased traffic arising from hauling building materials to and from the proposed development site which are likely to affect population and human health distant from the proposed development site, including adjacent to aggregate sources and landfill sites. Potential spillage (diesel and petrol) have the potential to occur.

Construction impacts are likely to be short term and are dealt with separately in the relevant chapters of this EIAR document and will be subject to control through the Construction Management Plan and Construction & Environmental Management Plan. The construction methods employed and the hours of construction proposed will be designed to minimise potential impacts. The development will comply with all Health & Safety Regulations during the construction of the project.

12.4.2 Operational Phase

The proposed development is a residential development of 272 units which includes provision of open space areas.

The main risk identified during operation is the risk of fire. It should be noted that the proposed uses are considered normal hazard fire risks as would be encountered in most residential developments and do not include any hazards which would be regarded as presenting an exceptional environmental fire hazard.

The fire risk mitigation for the project will comprise all fire safety measures necessary to comply with the requirements of Part B (Fire) of the Second Schedule to the Building Regulations 1997-2017. It is noted that these measures will be validated under the Building Control Act 1990-2007 through the obtaining, in due course, of statutory Fire Safety Certificates under Part III of the Building Control Regulations 1997-2020 from Louth County Council.

The measures will include inter alia:

- Provision of fire-rated walls and floors to restrict the spread of fire within and between buildings in accordance with relevant design guidance e.g. Technical Guidance Document B, BS9991, and BS9999. These measures will, in conjunction with the provision of automatic fire suppression in the taller blocks, serve to control/limit the size of conflagrations;
- Provision of early warning fire detection systems to ensure the earliest possible intervention in the event of fire occurrence;
- Use of materials which do not support fire spread with particular reference, inter alia, to internal wall and ceiling linings and external wall cladding.
- Facilities to assist the fire service including fire tender access proximate to all units, dry rising mains, and external fire hydrants
- A bespoke Fire Emergency Evacuation Plan [FEPP] will be prepared for the housing units in advance of occupation.
- The cleaning of windows in the buildings will be undertaken by a specialist contractor on behalf of the owner's management company. Window cleaning infrastructure has been designed into the scheme.
- Public lighting has been designed and incorporated as part of the scheme to ensure areas are well light for public use minimising risks to pedestrians and road users. A road safety and quality audit has also been undertaken to ensure potential risks to pedestrians and road users are designed out.

12.4.3 'Do Nothing' Scenario

In the do-nothing scenario, the potential risk of the proposed development causing, or being affected by a disaster and / or accident would be low, given that the site is currently an undeveloped greenfield site.

14.5 MITIGATION MEASURES

The Construction Management Plan and the Construction & Environmental Plan as well as good housekeeping practices will include the mitigation measures outlined below and which will limit the risk of accidents during construction. Fire safety will be dealt with under the Fire Safety Code at design and construction stage. The main contractor will have responsibility for fire safety during operations. In relation to falls these have been dealt with during design.

The proposed development will involve the ground works to facilitate the proposed development. Site investigations have been carried out and have not identified any hazardous material. Further testing will be carried out prior to construction to inform the detailed design. In the event that any hazardous material is identified the appropriate measures will be taken in accordance with the requirements of the EPA. The excavation and movement of soil from the site will be undertaken by a registered specialist contractor and removed to a licenced facility.

The following mitigation will be implemented, where relevant:

- Hazardous materials used during construction will be appropriately stored so as not to give rise to a risk of pollution.
- In the event of storms or snow, construction activity can be halted and the site secured. The construction activity will involve a number of potential risks, as set out below. The risks identified include traffic management, and fire strategy.
- 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 proposed works will take place away from the public road in a controlled environment, the objective of which is to minimise the short term disruption to local residents and reduce the potential for accidents.
- 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 natural disasters (e.g. flooding), the proposed development has undergone a Site Specific Flood Risk Assessment, prepared by JBA Consultants. The main area of the site where development is proposed is not at risk of fluvial, pluvial or groundwater flooding. A small part of the site is located within Flood Zone B, with this area maintained as landscaped open space in the proposed development.
- A Health and Safety Plan will be prepared (required by the *Safety, Health and Welfare at Work (Construction) Regulations 2013*) to address health and safety issues from the design stages through to the completion of the construction and maintenance phases. The Health and Safety Plan will comply with the requirements of the Regulations and will be reviewed as the development progresses.
- Safety on site will be of paramount importance. Only contractors with the highest safety standards will be selected and will include assessment of their safety performance over the previous 3 years including notifiable and reportable accidents to the Health and Safety Authority (HSA). During the selection of the relevant contractor and the respective subcontractors their safety records will be investigated further at both pre-tender stage and at pre-award meetings with the EHS department.
- Prior to working on site, each individual will receive a full safety briefing and will be provided with all of the safety equipment relevant to the tasks the individual will be required to perform during employment on site.
- Safety briefings will be held regularly and prior to any onerous or special task. 'Toolbox talks' will be held regularly to ensure all workers are fully aware of the tasks to be undertaken and the parameters required to ensure the task will be successfully and safely completed.
- All visitors will be required to wear appropriate personal protective equipment prior to going on to the site and will undergo a safety briefing by a member of the site safety team.
- Regular site safety audits will be carried out throughout the construction programme to ensure that the rules and regulations established for the site are complied with at all times.

Table 14.4 – Strategy for tackling potential risks – Bridgegate, Ardee

1. BASIC RISK INFORMATION			2.RISK ASSESSMENT INFORMATION		3. RISK RESPONSE INFORMATION (MITIGATION)
Risk Number	Risk Description / Risk Event Statement	Responsible	Impact H / M / L	Probability H / M / L	Actions
Provide a unique	A risk event states (I) what might happen in the	Name or title of team member	Enter H (High); M (Medium); or L (Low)	Enter H (High), M (Medium) or L (Low)	List, by date, all actions taken to respond to the risk. This

1. BASIC RISK INFORMATION			2.RISK ASSESSMENT INFORMATION		3. RISK RESPONSE INFORMATION (MITIGATION)
identifier for risk	future and (ii) its possible impact on the project.	responsible for risk	according to impact definitions	according to probability definitions	does not include assessing the risk
C01	Logistics - Traffic Management Plan to be developed.	Project Supervisor Construction Stage	M	M	<p>PSCS to develop Traffic Management Plan to implement mitigation measures in the CEMP/CMP . All material is within the site boundary. All parking is within the site boundary to limit any interaction with local areas or estates.</p> <p>This will avoid back up of traffic on approach, consideration of allocation of holding area. The road access to the site is from a secondary internal road. A booking system will be considered as necessary whereby contractor deliveries and collections can be managed to avoid traffic delays. The PSCS to provide an internal traffic management plan. The plan to include segregation of vehicles from staff and visitors that will be present on the site.</p>
C02	Scaffolding	PSCS	H	M	<p>Working at height required throughout the project. Installation of scaffolding for all working at height activities to be subject to a full temporary works design submission. To fully co-ordinate any temporary works submission the Project Supervisor for the Design Process must receive the following items before reviewing any submission; A full design submission, Calculations for the design, Design Risk Assessment, Copy of designer's PI insurances, Designers CV. This submission can then be reviewed by the Permanent Works Engineer to ensure the design will not impact on the permanent structure.</p>

1. BASIC RISK INFORMATION			2.RISK ASSESSMENT INFORMATION		3. RISK RESPONSE INFORMATION (MITIGATION)
C03	Fire Strategy	PSCS/ PSDP / Fire SC.	H	M	<p>Fire strategy must be put in place in advance of start on site which must take into consideration the requirement for hot works and the provision of Hot Works Permit systems to manage Hot works when needed.</p> <p>A fire marshal will be required - full co-operation from site supervisors and contractors will be required.</p>
CO4	Lifting Operations	PSCS / PSDP	H	M	<p>The PSCS must ensure there is a full risk assessed lift plan in place to manage all lifting operations on site.</p>
C05	Existing Utilities	PSCS / PSDP	H	M	<p>The PSDP must highlight the existence of live overhead/underground ESB cables on site.</p> <p>The PSCS must follow the ESB code of practice and provide a risk assessed RAMS document to manage this hazard.</p>

14.6 PREDICTED IMPACTS - RISK OF MAJOR ACCIDENTS AND/OR DISASTERS

A Risk Register has been developed which contains the main risks identified with the construction and operation of the Proposed Project. These have been identified as follows:

Table 14.5 – Risk Register

Risk No.	Risk Event	Possible Cause
1	Accidents during Construction	<p>Traffic accident</p> <p>Interaction with moving plant.</p> <p>Working at height /scaffolding</p> <p>Risk of fire</p>

		Groundwater pollution Noise Dust
2	Fire during Construction	Hot works requirements for gas installation
3	Lifting Operations	High winds Poor ground conditions Untrained personnel. Failures in lifting gear.
4	Fire following occupation	Inappropriate use of electrical devices / cooking etc.
5	Falls	Window cleaning

12.6.1 Risk Analysis

Following identification of risks, the next stage is to analyse how likely this is to occur and the consequences, should the risk arise. This will provide a risk score, i.e. the consequences versus the likelihood of the event taking place.

Table 14.6 – Risk Analysis

Risk ID	Potential Risk	Possible Cause	Environmental Effect	Likelihood Rating	Basis of Likelihood	Consequence Rating	Basis of Consequence	Risk Score
1a	Accidents during construction	Movement of vehicles	Injury or loss of life	3	Construction accident statistics	3	Could result in loss of life	9
1b	Back Injury	Manual handling	Injury or loss of life	3	Construction accident statistics	3	Could result in loss of life	9
1c		Slips or falls	Injury or loss of life	3	Construction accident statistics	3	Could result in loss of life	9
1d		Ground water pollution	Impact on aquatic life, illness	1	Lack of direct pathways, controls of run-off during construction	3	Could result in environmental pollution	3
2a	Fire during Construction	Hot Works	Fire Loss of life	3	Type of construction	3	Fire could result in loss of life	9
3a	Lifting Operations	Poor planning	Loss of life	3	Construction Statistics.	3	Poor planning could result in failure of lifting gear or cranes.	9
4	Fire following occupation	Electrical equipment / cooking	Injury or loss of life	1	Causes of fire statistics	3	Could result in loss of life	3
5	Falls	Loss of balance	Injury or loss of life	1	CSO statistics	3	Could result in loss of life	3

12.6.2 Risk Evaluation

Taking the above table, and applying it below, the red zone represents 'high risk' scenarios', the amber zone represents 'medium risk scenarios' and the green zone represents 'low risk scenarios.'

Table 14.7 – Risk Evaluation

Likelihood Rating	Very Likely	5					
	Likely	4					
	Unlikely	3			1a – 9, 1b – 9 1c – 9, 1d – 3 4 – 3, 5 - 3		
	Very Unlikely	2					
	Extremely Unlikely	1				2a - 3	
				Minor	Limited	Serious	Very Serious
			1	2	3	4	5
			Consequence Rating				

12.6.3 Main risks

The main risks arise during the construction period. Consequences may be limited but severe for the individuals concerned. Geographical widespread environmental consequences are unlikely.

14.7 INTERACTIONS

There are interactions with Population and Human Health, Land and Soils, Water, Noise, Climate and Air and Material Assets. However, subject to implementation of mitigation measures, good working practices and codes, the interactions between these areas have been sufficiently considered in relation to risk management.

14.8 RESIDUAL IMPACTS

Through the implementation of mitigation measures, there are no identified incidents or examples of major accidents and or natural disasters that present a sufficient combination of risk and consequence. The effects of such an event leading to significant residual impacts or environmental effects is very unlikely.

14.9 CUMULATIVE IMPACTS

There are cumulative impacts with Population and Human Health, Land and Soils, Water, Noise, Climate and Air, Landscape & Visual and Material Assets relating to permitted residential development at Bridgegate Phase 1-3 (Reg. Ref.: 10174; ABP Ref: PL.15238053), as amended. However, subject to implementation of mitigation measures, good working practices and codes, the interactions between these areas have been sufficiently considered in relation to risk management.

Any works on the public road and the laying of underground pipes would be carried out on behalf of the relevant statutory undertakers and would be subject to a separate construction management plan.

14.10 DIFFICULTIES ENCOUNTERED IN COMPILING

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

15.0 INTERACTIONS OF THE FORGOING

15.1 INTRODUCTION

The purpose of this section of the EIAR is to draw attention to significant interaction and interdependencies in the existing environment. In preparing the EIAR each of the specialist consultants have and will continue to liaise with each other and will consider the likely interactions between effects predicted as a result of the proposed development during the preparation of the proposals for the subject site and this ensures that mitigation measures are incorporated into the design process.

This approach is considered to meet with the requirements of Part X of the Planning and Development Act 2000 and Part 10, and Schedules 6 and 7 of the Planning and Development Regulations 2001 as amended as well as the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018. The detail in relation to interactions between environmental factors will be covered in each chapter of the EIAR.

All environmental factors are interlinked to a degree such that interrelationships exist on numerous levels. Interactions within the study area can be one-way interactions, two-way interactions and multiple-phase interactions which can be influenced by the proposed development. As this EIAR document has been prepared by a number of specialist consultants an important aspect of the EIA process is to ensure that interactions between the various disciplines have been taken into consideration.

This chapter of the EIAR was prepared by Ian Livingstone, MA Honours, MSc., MRTPI, Associate Director with John Spain Associates.

The purpose of this requirement of an EIAR is to draw attention to significant interaction and interrelationships in the existing environment. John Spain Associates, Planning & Development Consultants, in preparing and co-ordinating this EIAR ensured that each of the specialist consultants liaised with each other and dealt with the likely interactions between effects predicted as a result of the proposed development during the preparation of the proposals for the subject and ensuring that appropriate mitigation measures are incorporated into the design process.

Having regard to the approach taken, the aspects of the environment likely to be significantly affected by the proposed development, during both the construction and operational phases, have been considered in detail in the relevant Chapters of this EIAR document. In addition, likely interactions between one topic and another have been discussed under each topic Chapter by the relevant specialist consultant.

The primary interactions can be summarised as follows:

- Design with water and land and soils;
- Landscape design, engineering services with biodiversity;
- Visual impact with biodiversity;
- Biodiversity with water and soils;
- Noise and vibration and traffic with human health; and
- Air quality and climate and traffic.

The relevant consultants liaised with each other and the project architects, engineers and landscape architects where necessary to review the proposed scheme and incorporate suitable mitigation measures where necessary. As demonstrated throughout this EIAR, most inter-relationships are neutral in impact when the mitigation measures proposed are incorporated into the design, construction or operation of the proposed development.

Table 15.1 – Summary of interactions between the environmental factors

✓ - Confirms interaction ✗ - No interaction

Interaction	Population & Human Health		Archaeology and Cultural Heritage	Biodiversity		Landscape and Visual	Land and Soils	Water	Air Quality and Climate	Noise and Vibration	Material Assets - Traffic	Material Assets - Waste	Material Assets - Utilities	Risk Management
Population & Human Health			✗	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Archaeology & Cultural Heritage	✗			✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Biodiversity	✗	✗			✓	✗	✓	✓	✗	✓	✓	✓	✗	✗
Landscape and Visual	✓	✓	✓			✗	✓	✗	✗	✗	✓	✗	✗	✗
Land and Soils	✓	✗	✓	✗			✓	✓	✗	✓	✓	✗	✗	✓
Water	✓	✗	✓	✗	✓			✓	✗	✓	✓	✗	✗	✓
Air Quality and Climate	✓	✗	✓	✗	✓	✓	✓			✗	✓	✗	✗	✓
Noise and Vibration	✓	✗	✗	✗	✗	✗	✗	✗			✓	✗	✗	✓

Material Assets – Traffic	✓	✗	✗	✗	✓	✗	✓	✓			✗	✗	✓
Material Assets – Waste	✓	✗	✓	✓	✓	✓	✗	✗	✓			✗	✓
Material Assets – Utilities	✓	✗	✗	✗	✗	✓	✗	✗	✗	✓			✓
Risk Management	✓	✗	✗	✗	✓	✓	✓	✓	✓	✓	✓		

15.2 SUMMARY OF PRINCIPAL INTERACTIONS

Table 15.2 – Summary of Potential Interactions / Inter-relationships

Subject	Interaction With-	Interactions / Inter-Relationships
Population and Human Health	Air Quality & Climate / Material Assets - Traffic	<p>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. 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. Dust emissions from the construction phase of the proposed development have the potential to impact human health through the release of PM₁₀ and PM_{2.5} emissions.</p> <p>There is the potential for a number of greenhouse gas emissions to atmosphere during the construction of the development. Construction vehicles, generators etc., may give rise to CO₂ and N₂O emissions. The Institute of Air Quality Management document <i>Guidance on the Assessment of Dust from Demolition and Construction</i> (IAQM, 2014) states that site traffic and plant is unlikely to make a significant impact on climate.</p> <p>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 impact of construction of the proposed development is likely to be negative, short-term, localised and imperceptible with respect to human health. Impacts upon air quality and climate will be short term and imperceptible during construction.</p> <p>There is the potential for a number of greenhouse gas emissions to atmosphere during the operational phase of the development however these are significantly less than the 2030 target set out under EU legislation. The primary sources of air and climatic emissions in the operational context are deemed long term and will involve the change in traffic flows in the local areas which are associated with the development. Air dispersion modelling of traffic emissions has shown that levels of all pollutants are below the ambient air quality standards set for the protection of human health.</p> <p>The sustainable features that are incorporated into the design of all residential units, crèche and community building will ensure that the operational phase of the development at Bridgeway will not have an adverse impact on human health, local air quality or on local or global climate patterns. The residential units will be designed to ensure that they</p>

Subject	Interaction With-	Interactions / Inter-Relationships
		can withstand the potential changes in climate which may generate more extreme and prolonged meteorological events in the future.
Population and Human Health	Noise and Vibration	During the construction phase of the project there will be a short-term noise impact on nearby noise sensitive properties from site activities in proximity to Noise Sensitive Locations. The application of binding noise limits, hours of operation, along with implementation of appropriate noise and vibration control measures will ensure that noise and vibration impacts are kept to a minimum in so far as practicable. Restricted working hours will further mitigate noise impact during construction with appropriate mitigation measures such as control of noise sources, screening, selection of quiet plan and ongoing monitoring implemented to ensure noise and vibration is kept to a minimum.
Population and Human Health	Material Assets – Traffic / Waste	There will be unavoidable localised temporary impacts on the immediate surrounding area during the construction phase of the proposed development including increased traffic associated with the construction process. Construction Management Plan and Construction Traffic Management Plan will be developed to minimise disruption and to accommodate local traffic flows.
Population and Human Health	Land and Soils	The construction phase of development including excavation has the potential to put workers at risk from soil contaminants (if present in underlying strata). Excavation and stripped soil can be disturbed and eroded by site vehicles. The implementation of mitigation measures set out at Section 5.7.1 of this EIAR in combination with monitoring will ensure potential impacts are minimised.
Population and Human Health	Water	No negative residual impacts to water quality are anticipated with the implementation of the construction and operational mitigation measures outlined in Section 6.8 of the EIAR. Petrol/ oil interceptors and grease trays where required will ensure improved quality of surface water run-off from the development to the existing, with a reduced surface water runoff. The development will result in additional demands on the public water network however the installation of low flow devices will minimise the impact of the development on the existing water supply network.
Population and Human Health	Material Assets - Utilities	The proposed development will be connected to water, telecommunications and power and electricity infrastructure, with two ESB substations proposed alongside drainage infrastructure. Dwellings and buildings will be constructed in accordance with building standards. Mitigation

Subject	Interaction With-	Interactions / Inter-Relationships
		measures set out at Section 12.9 of this EIAR ensure impacts are not significant in the long term.
Population & Human Health / Air & Climate / Noise & Vibration / Traffic / Waste Management	Risk Management	Population and human health is the central interaction with Risk Management and can be considered collectively with air/climate, noise/vibration, traffic/waste management, each of which have effects on human health and the risk of accidents primarily during the construction phase of development. A construction traffic management plan will be implemented prior to the commencement of development and agreed with the local authority. Following the implementation of best practice health and safety guidelines and mitigation measures detailed in Chapter 14, significant impacts are not considered likely.
Risk Management	Water / Land & Soils	The risk of accidents primarily during the construction period can result in emissions / spillages which may impact upon the ground and potentially impact water courses. Relevant mitigation measures are set out in Chapter 14 which will reduce the risks of accidents occurring and ensure a safe environment for staff and visitors.
Risk Management	Utilities	The PSDP must highlight the existence of live overhead/underground ESB cables on site. The PSCS must follow the ESB code of practice and provide a risk assessed RAMS document to manage this hazard. Best practice and appropriate mitigation measure in accordance with Chapter 14 will be followed to reduce risks.
Biodiversity	Water	The key environmental interactions with biodiversity are with water and landscaping. A series of mitigation measures are proposed in the Water Chapter 6 of this EIAR to ensure the quality (pollution and sedimentation) and quantity (surface run-off and flooding) is of an appropriate standard, as well as relevant mitigation measures set out in the accompanying Construction & Environmental Management Plan. Implementation of the mitigation measures will mitigate any significant long-term adverse impact on the water environment as it relates to biodiversity. No negative residual impacts to water quality are anticipated with the implementation of the demolition, construction and operational mitigation measures.
Biodiversity	Landscape and Visual	The key environmental interactions with biodiversity are with water and landscaping. A series of mitigation measures are proposed in the Water Chapter 6 of this EIAR to ensure the quality (pollution and sedimentation) and quantity (surface run-off and flooding) is of an appropriate standard, as well as relevant mitigation measures set out in the accompanying Construction & Environmental Management Plan. Implementation of the mitigation measures will mitigate any significant long-term

Subject	Interaction With-	Interactions / Inter-Relationships
		adverse impact on the water environment as it relates to biodiversity. No negative residual impacts to water quality are anticipated with the implementation of the demolition, construction and operational mitigation measures.
Water	Biodiversity/Soils	The groundwater on the site is likely provides a baseline flow to the Rathgory Tributary (which is proposed to be realigned as part of the proposed development). The watercourse bisects the site on the east-west axis and is both a relevant surface water receptor, pathway and an ecological receptor. If construction activities cause pollutants to be released to soils they could reach groundwater and surface water receptors. Construction activities will be strictly controlled to ensure best practice in relation to the protection of surface water and groundwater systems. A range of Sustainable Drainage Systems (SuDS) measures are proposed to ensure the improvement in overall stormwater quality prior to its disposal into a watercourse or to allow the storm water to infiltrate into the groundwater table.
Water	Biodiversity	<p>Surface water run-off from construction activities has the potential to be contaminated. A deterioration in water quality at the Rathgory Tributary (which bisects the site) would adversely impact aquatic biodiversity, could occur during the construction phase of the proposed development due to rainwater run-off containing sediments, concrete and hydrocarbon spillages, and during the operational phase due to the discharge of domestic wastewater.</p> <p>During the construction phase, surface water quality would be protected through the implementation of mitigation measures as set out at Section 6.8 of this EIAR. These includes controlling of dewatering and surface water discharges on the site, batching and mixing activities will be located in areas away from watercourses and drains during construction and prior to completion, which include the regular maintenance and inspection of construction plant. A monitoring programme including sampling for water quality before discharge to the Council sewer during construction will be carried out to ensure that only clean surface water is discharged to the receiving systems. Therefore, no potential significant impacts upon water quality is anticipated during the construction phase. There would be no potential impacts to water quality during the operational phase of the development due to the operation of SUDS features, with all domestic wastewater directed to the Irish Water system and wastewater treatment plant for treatment prior to discharge.</p>
Material Assets Waste	Water	Correct classification and segregation of excavated material is required to ensure that any potentially

Subject	Interaction With-	Interactions / Inter-Relationships
		<p>contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site. It is anticipated that this material will require removal from site for offsite reuse, recovery, recycling and/or disposal. The contractor(s) will endeavor to ensure that material is reused or recovered off-site insofar as is reasonably practicable or disposed of at authorized facility. Waste would be segregated and stored in suitably contained waste receptacles at the site compound, considerably reducing the potential risk of pollution to water.</p> <p>It is not considered that there would be any significant risk to water quality as a result of waste management during the operational phase. On-site segregation of all waste materials will be implemented, with colour-coded bins, with all waste leaving the site transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities, which would have environmental controls in place as standard.</p>
Material Assets Waste	Biodiversity	<p>Waste has the potential to impact upon biodiversity during the construction phase, by causing pollution to soils and water and by potentially attracting pests / vermin to the site. However, as discussed in the sections above and as set out in the Construction & Demolition Waste Management Plan, waste would be stored in suitably contained waste receptacles at the site compound, reducing the potential of pollution to soils and water. The majority of wastes generated during the construction phase would be inert materials, which would reduce the potential for issues regarding pests / vermin.</p> <p>It is not considered that there would be any significant impact upon biodiversity due to waste management during the operational phase, given that waste would be collected by licenced waste contractors and recovered, recycled or disposed of at appropriately licenced waste facilities.</p>
Land and Soils	Material Assets – Waste	<p>During the construction phase excavated material (c. 42,096m³) will be generated from the excavations required to facilitate construction of the new foundations, site levelling and the installation of underground services. It is envisaged that 34,231m³ excavated material will be taken offsite it will be taken for reuse or recovery, where practical, with disposal as last resort. Adherence to the mitigation measures in Chapter 11 and the requirements of the C&D Waste Management Plan will ensure the effect is long-term, imperceptible and neutral.</p>

Subject	Interaction With-	Interactions / Inter-Relationships
Land and Soils	Water	<p>There is an interaction between land and soils and water environment arising from the realigned Rathgory Tributary which bisects the site. This will result in a more efficient water channel with a low flow channel to accommodate the 50% AEP event flow which has a width of 1.8m and height of c. 0.2m. A 20m riparian corridor has been provided extending 10m from each bank. Culverts are implemented at 2 no. crossing points. The proposal will be subject to consent under Section 9 of the Arterial Drainage Act (1945) and will increase biodiversity as well as water quality and mitigate flood risk downstream, detailed in the submitted Site Specific Flood Risk Assessment.</p>
Air Quality & Climate	Population and Human Health	<p>An adverse impact on air quality has the potential to impact upon human health, cause dust nuisance and cause disturbance to fauna. However, the risk to air quality as a result of the proposed development would not be considered significant, both at the local community level and on a broader national / global scale.</p> <p>During the construction phase of the development, there would be potential for dust emissions, which could impact upon the communities and residents on the roads to the site and fauna in the surrounding area. The potential impact of dust would be temporary, given the transient nature of construction works. Dust control would be an integral part of construction management practices, with mitigation measures implemented where required, including sweeping of roads and hardstand areas, appropriate storage and transport of material and dust suppression measures where required.</p> <p>It should be noted that an important interaction exists between air quality and flora, whereby vegetation can play an important role in acting as an air purifier by absorbing carbon dioxide and giving out oxygen. It would therefore be anticipated that potential carbon dioxide emissions generated by home heating systems and discharged from vehicle exhausts would be somewhat mitigated by existing hedgerows and planting at west and east site boundaries.</p>
Air Quality & Climate	Surface Water / Groundwater	<p>The interactions between Air & Climate and surface water and groundwater will be mainly limited to the construction phase and are mitigated by the drainage design and proposed mitigation measures.</p>
Air Quality & Climate	Biodiversity	<p>An increase in dust emissions during the construction phase has the potential to adversely impact upon flora by blocking leaf stomata, interfering with photosynthesis, respiration and</p>

Subject	Interaction With-	Interactions / Inter-Relationships
		transpiration processes. However, given the transient nature of construction works, and given that standard dust control measures would be implemented, no significant impact would be anticipated.
Air Quality & Climate	Land and Soils	Exposed soil during the construction phase of the proposed development may give rise to increased dust emissions. However, the implementation of the dust management and dust control measures will ensure that the proposed development will not give rise to the generation of any significant quantities of dust.
Noise and Vibration	Population and Human Health/Traffic	<p>During the construction phase of the project there will be a short-term noise impact on nearby noise sensitive properties from site activities in proximity to Noise Sensitive Locations. The application of binding noise limits, hours of operation, along with implementation of appropriate noise and vibration control measures will ensure that noise and vibration impacts are kept to a minimum in so far as practicable. Restricted working hours will further mitigate noise impact during construction with appropriate mitigation measures such as control of noise sources, screening, selection of quiet plan and ongoing monitoring implemented to ensure noise and vibration is kept to a minimum.</p> <p>Having regard to the transient nature of construction works, and provided mitigation measures are implemented, noise and vibration from construction would not be considered to pose a significant impact upon human beings, with likely noise effects during the construction phase at nearby noise sensitive locations described as negative, moderate and short-term. The likely residual vibration effects during the construction phase at nearby sensitive locations can be described as neutral, imperceptible, and short-term.</p> <p>The predicted increase in traffic flows associated with the development in the years 2024 and 2039 will result in an imperceptible increase of less than 1 dB along all roads receiving traffic from the proposed development.</p>
Landscape and Visual	Population and Human Health	Changes to the landscape character of the site itself will include the development of new buildings and associated landscape. The landscape and visual impact associated with Population and Human Health focuses on the effects to dwellings and other receptors in the surrounding area. The settlement pattern comprises established residential development to the west and north, with the initial phases of the Bridgegate development under construction to the north west. Ardee town centre is located c. 1km north, with agricultural lands

Subject	Interaction With-	Interactions / Inter-Relationships
		<p>extending to the south and east. The proposed development generates visual effects detailed with Chapter 9 of this EIAR. The nature of the local topography combined with the siting and scale of the proposed development ensures that visual impacts are minor in nature and will integrate appropriately with the existing environment.</p>
Landscape and Visual	Biodiversity	<p>The proposed development provides c. 42% of the overall site as public open space, with a comprehensive landscaping and planting strategy providing a net increase in trees on the site. The c. 3.6 ha public park at Mulladrillen Hill will provide a landscaped finish to this area of amenity and complement the linear park and riparian corridor around the Rathgory Tributary which will enhance biodiversity onsite adding positively to the environment in the operational phase. The combination of public open spaces (c. 1.8 ha excluding the public park) provide a varied range of planting. Existing boundary hedgerows will be consolidated, with positive long term biodiversity impacts arising from the development.</p>
Landscape and Visual	Water	<p>The proposed landscaping strategy is fully integrated with the SUDS drainage strategy proposed to limit surface water runoff to greenfield levels and will reduce the overall peak flow to the Rathgory Tributary as set out in the accompanying SSFRA prepared by JBA Consulting. Landscaping strategy incorporates SUDS elements such as permeable paving, water butts to retain rainwater and low water sanitary appliances. The comprehensive landscaping strategy will have a positive long-term impact on the water environment.</p>
Surface Water / Groundwater	Soils / Material Assets - Waste	<p>There is an interaction between the lands, soil and water as the development of the site and particular the linear park and the Rathgory Tributary. SUDS features and finished road levels will manage and control flooding in the vicinity of the lands.</p> <p>There is a close link between soils & geology and water (hydrogeology and hydrology). For example, the erosion of sediments during the construction phase can, if not mitigated result in additional siltation in nearby surface watercourses. Due to this inter-relationship, the impacts discussed in this section will be considered applicable to both the geological water and ecological environment.</p> <p>Impacts on the geological environment will also affect the agricultural environment. The removal of agricultural soils during the proposed construction project is inevitable.</p> <p>Waste Management and dust management is also considered in interactions as soil removal will be</p>

Subject	Interaction With-	Interactions / Inter-Relationships
		required for this development. Interactions between soils/geology will be mainly limited to the construction phase due to material excavation.
Material Assets - Waste	Population and Human Health	<p>The potential impacts on human beings in relation to the generation of waste during the construction and operational phases are that incorrect management of waste could result in littering which could cause a nuisance to the public and attract vermin. A carefully planned approach to waste management and adherence to the project specific C&DWMP and OWMP, will ensure appropriate management of waste and avoid any negative impacts on the local population. The effects will be long-term, imperceptible and neutral.</p> <p>During the construction phase, wastes would be segregated and stored in suitably contained waste receptacles at the site compound. This would considerably reduce the potential risk of pollution to soils and water. Waste would be removed from the development on a regular basis, to avoid the accumulation of high waste volumes, which could cause nuisance. It should also be noted that given the inert nature of the majority of C&D waste types, it is unlikely that issues regarding odour or pests would arise. During the operational phase, suitably contained wheelie bins / waste receptacles would be provided to the residential area and childcare facility by private waste contractors, thus there would be no significant risk of pollution to soils. Waste would be collected on a regular basis, typically on a two-weekly basis alternating between recyclables and municipal waste. Therefore, waste would not be envisaged to accumulate to high enough volumes to cause nuisance.</p>
Material Assets - Waste	Landscape Biodiversity /	Waste and litter have the potential to adversely affect the appearance of the landscape and biodiversity. However, as waste management measures would be implemented as part of the proposed development, it is considered that there would be no significant adverse impact upon the landscape or biodiversity at the development.
Material Assets - Waste	Traffic Transportation &	Local traffic and transportation will be impacted by the additional vehicle movements generated by removal of waste from the site during the construction and operational phases of the development. The increase in vehicle movements as a result of waste generated during the construction phase will be temporary in duration. There will be an increase in vehicle movements in the area as a result of waste collections during the operational phase but these movement will be imperceptible in the context of the overall traffic and transportation increase and has been addressed in Chapter 10 Material Assets – Traffic. Provided the

Subject	Interaction With-	Interactions / Inter-Relationships
		mitigation measures detailed in Chapter 11 and 10 and the requirements of the OWMP (included as Appendix 11.2) are adhered to, the effects should be short to long-term, imperceptible and neutral.
Material Assets - Utilities	Material Assets - Waste management, and Water (hydrogeology)	The proposed works result in an increase in surface water runoff, if not catered for adequately this may have an effect on the hydrogeology. Waste water and drainage strategy proposed will have a long-term neutral and imperceptible impact. The waste management strategy for the construction and operational phases of development are detailed within Appendix 11.1 and 11.2.
Material Assets - Traffic	Population and Human Health	Temporary negative impacts to human health may be likely during the construction phase due to noise, dust, air quality and visual impacts which are discussed in other chapters within this EIAR. The construction traffic impacts, which would also be temporary in duration are not considered to be significant due to the implementation of the mitigation measures identified in section 10.9 of the EIAR.
Material Assets - Traffic	Soils	There is the interaction between Land and Soils Chapter where the import and export of construction materials is considered. It is noted that the designs have been developed to minimise excavation as far as possible. The associated construction traffic has been considered in the construction stage impacts in the Outline Construction Management Plan.

16.0 SUMMARY OF EIA MITIGATION AND MONITORING MEASURES

16.1 INTRODUCTION

The central purpose of EIA is to identify potentially significant adverse impacts at the pre-consent stage and to propose measures to mitigate or ameliorate such impacts. This chapter of the EIAR document has been prepared by John Spain Associates and sets out a summary of the range of methods described within the individual chapters of this EIAR document which are proposed as mitigation and for monitoring. It is intended that this chapter of the EIAR document will provide a useful and convenient summary to the competent/consent authority of the range of mitigation and monitoring measures proposed. This chapter of the EIAR was prepared by Ian Livingstone MA Honours, MSc. MRTPI, Associate Director with John Spain Associates and approved by Rory Kunz, BA (MOD), MScERM, MAT&CP, Dip EIA Mgmt., Executive Director with John Spain Associates.

The chapter is based on the mitigation measures set out in relevant chapters of the EIAR prepared by relevant expert consultants.

EIA related conditions are normally imposed by the competent/consent authority as part of conditions of planning consent and form a key part of the Impact Anticipation and Avoidance strategy. Conditions are principally used to ensure that undertakings to mitigate are secured by explicitly stating the location, quality, character, duration and timing of the measures to be implemented. A secondary role of EIA related conditions is to ensure that resources e.g. bonds / insurances will be available and properly directed for mitigation, monitoring or remedial action, in the event that the impacts exceed the predicted levels.

Monitoring of the effectiveness of mitigation measures put forward in the EIAR document, both by the competent authorities and the developer, is also an integral part of the process. Monitoring of environmental media and indicators arise either from undertakings or from conditions.

In the case of mitigation and monitoring measures it is important for all parties to be aware of the administrative, technical, legal and financial burdens that can accompany the measures proposed. It is also important to ensure that, where monitoring is provided for, it is clearly related to thresholds, which if exceeded cause a clearly defined set of actions to be implemented.

16.2 MITIGATION STRATEGIES

16.2.1 Introduction

There are three established strategies for impact mitigation - avoidance, reduction and remedy. The efficacy of each is directly dependent on the stage in the design process at which environmental considerations are taken into account (i.e. impact avoidance can only be considered at the earliest stage, while remedy may be the only option available to fully designed projects).

16.2.2 Mitigation by Avoidance

Avoidance is generally the fastest, cheapest and most effective form of impact mitigation. Environmental effects and consideration of alternatives have been taken into account at the earliest stage in the project design processes. The consideration of alternatives with respect to the development of the subject lands has been described in Chapter 2.

16.2.3 Mitigation by Reduction

This is a common strategy for dealing with effects which cannot be avoided. It concentrates on the emissions and effects and seeks to limit the exposure of the receptor. It is generally regarded as the "end of pipe" approach because it does not seek to affect the source of the problems (as do avoidance strategies above). As such this is regarded as a less sustainable, though still effective, approach.

16.2.4 Reducing the Effect

This strategy seeks to intercept emissions, effects and wastes before they enter the environment. It monitors and controls them so that acceptable standards are not exceeded. Examples include wastewater treatment, filtration of air emissions and noise attenuation measures.

16.2.5 Reducing Exposure to the Impact

This strategy is used for impacts which occur over an extensive and undefined area. Such impacts may include noise, visual impacts or exposure to hazard. The mitigation is effected by installing barriers between the location(s) of likely receptors and source of the impact (e.g. sound barriers, tree screens or security fences).

16.2.6 Mitigation by Remedy

This is a strategy used for dealing with residual impacts which cannot be prevented from entering the environment and causing adverse effects. Remedy serves to improve adverse conditions which exist by carrying out further works which seek to restore the environment to an approximation of its previous condition or a new equilibrium.

Mitigation and Monitoring Measures

The following provides a list, for ease of reference, of the mitigation and monitoring measures recommended in each chapter of the EIAR.

16.3 PROJECT DESCRIPTION & ALTERNATIVES EXAMINED

16.3.1 Construction Management Strategy

It is envisaged that the development of the lands subject of the proposed development will occur over a 3-5 year period. Given the nature of the project and the need for flexibility to respond to market demand, the development phases are indicative. A Construction & Environment Management Plan has been prepared by CS Consulting which, has been reviewed by the relevant EIAR consultants and is included in the application.

Construction Traffic Management Plan

A Construction Traffic Management Plan (CTMP) will be prepared by the main contractor and agreed with the Planning Authority prior to commencement of development in the event of a grant of permission. Chapter 10: Traffic includes draft information on traffic management for the construction stage of the development.

16.4 POPULATION AND HUMAN HEALTH

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. The chapter has been prepared by John Spain Associates.

16.4.1 Construction Phase

POP & HH CONST 1:

In order to protect the amenities enjoyed by nearby residents, premises and employees a Construction Management Plan (including traffic management) shall be submitted by the contractor and implemented during the construction phase. A detailed Construction & Environmental Management Plan will also be prepared and be submitted by the contractor and implemented during the construction phase. The CMP and CEMP will incorporate the relevant mitigation measures outlined in this EIAR.

With reference to the construction phase of the proposed development, the objective of the Construction and Operational Waste Management Plan prepared by AWN are 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. The mitigation relating to the Construction and Demolition Waste Management Plan is summarised in Chapter 11 of the EIAR and detailed further in Appendix 11.1.

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 are away from the public road in a controlled environment. The objective of which is to minimise the short-term disruption to local residents, and reduce the potential for accidents.

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 natural disasters (e.g. flooding), the proposed development has undergone a SSFRA, prepared by JBA Consulting Engineers. The main area of the site where development is proposed is not at risk of fluvial, pluvial or groundwater flooding.

16.4.2 Operational Phase

The operation phase is considered to have likely positive impacts on human beings in relation to the provision of additional residential units, community facilities, and high-quality open space, pedestrian/cyclist facilities and bus stop to cater for the demands of a growing population and encourage active travel modes in accordance with the principles of sustainable development and residential zoning objectives pertaining to the site. Internal road layout design has been informed by and developed in accordance with the principles of DMURS in order to ensure a safe and pedestrian friendly environment which will help to mitigate risk of accidents.

16.5 BIODIVERSITY

Chapter 4: Biodiversity has been prepared by Altermar Consulting. Mitigation measures will be incorporated into the proposed development to minimise the potential negative impacts on the ecology within the ZOI. These measures are outlined below in sequence and incorporate elements outlined elsewhere in this EIAR which will be incorporated into the CEMP.

Standard construction and operational controls will be incorporated into the proposed development project to minimise the potential negative impacts on the ecology within the Zone of Influence (Zoi) including the Rathgory Tributary and River Dee.

Designated Conservation sites within 15km

As the main potential vector for impacts would be seen to be via the River Dee, no additional controls are required besides those outlined below, during the construction and operational phases of the development, to mitigate against potential negative impacts on designated conservation sites. The mitigation has been designed to ensure that the project will comply with the Water Pollution Acts and standard LCC and IFI Conditions in relation to construction and drainage. All construction and operational phase mitigation measures outlined in this EIAR will be incorporated into the CEMP will be implemented. The CEMP will reflect the outcome EIA process as part of approval by the Competent Authority and will incorporate any additional measures deemed appropriate prior to the commencement of the relevant phase on site.

16.5.1 Construction Phase

Development Construction

Contamination of watercourses. As existing drainage ditches are present on site, in proximity to the Rathgory Tributary and substantial instream works are proposed, a project ecologist will be appointed prior to works or site clearance commencing on site. All works in the riparian corridor will be carried out in consultation with and to the satisfaction of IFI and the project ecologist, following the best practice guidelines for construction in the vicinity of watercourses.

All works on site and in the riparian corridor will include mitigation measures to prevent silt from runoff during works as set out below.

Riparian Corridor Construction Stage

As significant site clearance is involved in the project and the site is on sloping land adjacent to a watercourse, measures will be put in place to ensure that runoff from the site during construction is contained and that silt is intercepted. A silt interception system will be prepared in consultation with the project ecologist. The purpose of this is to ensure that silt is removed from runoff prior to entering the stream throughout the construction process. The following measures will be carried out to ensure that the site runoff is suitably contained during construction:

- a) Site works will commence with the submission of a construction methodology to IFI. It should be noted that the watercourse will be fisheries compliant and will contain features for biodiversity enhancement. Following agreement of the methodology with IFI the excavation of the riparian diversion will be carried out in the dry, isolated from the existing watercourse. Only when all dry works have been completed and inspected by the ecologist and IFI will the stream become live.

- b) Once the realignment has been carried out the riparian buffer of 10m will be established, landscaped and marked out prior to site clearance works on the remainder of the site. It is important that this area is cleared and landscaped in late spring/early summer as a portion of this area is within the potential flood zone of the river and landscaping needs to be well established prior to any risk of flooding, in order to limit any silt entering the stream during a flood.
- c) The placing of silt fences in the riparian corridor will be carried out to prevent runoff entering the newly established riparian corridor. It is important that the bases of these are buried deeply in the soil as this area has the potential to be flooded and they could cause downstream impacts if not installed correctly. The riparian buffer of 10m will be established, landscaped and marked out to avoid machinery access, prior to site clearance works on the remainder of the site.
- d) A temporary trench will be dug at the edge of the riparian corridor so that any runoff during works will run parallel to the river and be caught by silt fences and measures in the trench. All planting and landscaping should be carried out immediately.
- e) Following the completion of this element of the project this area of the site will be closed off to machinery access.

Drainage on site outside the riparian corridor.

- a) Channels will be prepared on site, in the vicinity of future access roads. Within these channels silt fences/barriers will be placed and will consist of woven/terram style material of suitable density to remove the majority of silt from runoff. These will be maintained throughout the construction phase to ensure efficiency, prior to the installation of the permanent drainage network.
- b) Silt fences will be placed along the edge of the riparian corridor (outside of future construction areas) to capture runoff from the site. These will also prevent machinery from entering the riparian corridor.
- c) Mitigation measures including silt fences will be in place (in consultation with the project ecologist and IFI) to capture silt from runoff and prevent it from entering the stream during the culvert works.
- d) Appropriate storage and settlement facilities will be provided on site. This could include the provision of silt and petrochemical interception for water pumped on site (if required).
- e) Fuel, oils and Chemicals will be stored on an impervious base with a bund. Under LEED there will be a strategy put in place to prevent pollution of the watercourse. In most cases this will involve collecting the run-off and routing it to treatment by filtration, settlement or specialist techniques.

Additional mitigation if required will be placed on roadworks to capture silt that may not be caught by road sweeping, before runoff enters the Rathgory Tributary.

Culvert Installation Methodology

It is proposed to install three river crossings (2 vehicle and 1 pedestrian). Due to the presence of sensitive species downstream of the works (Otter (*Lutra lutra*) and Atlantic salmon (*Salmo salar*)) in addition to having a direct hydrological pathway to two Natura 2000 sites downstream and the necessity to comply with Water Pollution Acts, it has been deemed necessary to limit the potential impact of the works, implement mitigation measures and carry out the instream works as follows:

Pre-Installation:

Prior to carrying out the works the project will:

- Submit a final methodology statement at least 1 month before the proposed in stream works to IFI.
- Notify IFI one week in advance of each culvert works commencing.
- Electrofish the water within the full extent of the works location to 50m downstream (if required by IFI), at the start of the project. Remove any fish and transport downstream (It would be preferable if this was carried out by IFI on the day of connection works if possible).

Installation process (live downstream culvert):

- A temporary stream diversion will be prepared with a 900mm diameter pipe.

- A minimum of four independent terram baffles will be placed downstream of the proposed works.
- The stream will be diverted through the pipe which will allow access to the bed of the original stream.
- The culvert will be installed in the dry while the river remains on its diverted course. The excavation will leave two areas of soil at either end of the diversion to prevent the river from entering the works area.
- Pumps will be placed within the diversion area should any seepage, rainwater or groundwater enter the works area. These are to be connected to silt busters/or to the onsite swales as directed by the project ecologist (and not directly back to the stream without filtering). Any seepage/rainwater/groundwater will be pumped onto open ground north of the river and allowed to seep naturally into the groundwater. No runoff will be allowed back into the stream.
- The excavated material will be stockpiled on site away from the watercourse (min 20m).
- Concrete units will be delivered to site on an Artic truck
- The new culvert sections will be lifted with the crane and placed on to the bed of Sand/stone as required.
- Minor adjustments if required will be made to ensure the first section is correct for line and level.
- The remaining sections will be installed using the same procedure.
- On completion of the installation backfilling will commence to the sides of the culvert.
- Backfill material will be placed and compacted in layers.
- New ducting sections will be placed downstream of the culvert.
- The ecologist will be in attendance for environmentally sensitive works.
- On completion of the backfilling the small remaining bunds trench will be removed.
- Silt interception methods will be implemented downstream prior to instream works.
- Instream biodiversity elements will be placed within the watercourse as instructed by the ecologist/IFI.
- A gradual switchover will be implemented and the stream will flow through the newly installed culvert under supervision of project ecologist.
- A gradual switch over to the diversion will be monitored by the project ecologist. This will involve the stream being gradually dammed both upstream and downstream of the crossing location using sandbags.
- Once the full flow is in the diversion and stable the Existing stream bed will then be gradually blocked off with sandbags and final elements of rock armour will be carried out behind sand bags.
- When complete downstream mitigation measures will be removed.

To construct the culverts at the mid and eastern end of the site these will be done in the dry and will not involve the diversion of the watercourse.

Relocate & Culverting of Stream

The future diversion of and installation of the culverts in, the Rathgory Tributary will be carried out in the dry, prior to carrying out any instream works, in order to mitigate the silt disruption caused from the installation of the proposed culvert. The installation of culverts will take approx. 5-7 days. During the works period, a project ecologist/senior environmental advisor will be in attendance to monitor sensitive works (instream/connection works). Culvert installation will be carried out in the dry and the entire project. The Rathgory Tributary will be connected to its new course following the installation under the supervision of the project ecologist. IFI may require inspection of the culvert prior to the Rathgory Tributary becoming live in the new diversion and culvert.

Detailed mitigation measures are set out in Table 4.5 of this EIAR and Table 2 of the CEMP.

Birds

Avoidance of the bird nesting period for tree removal and hedgerow clearance

All clearance operations shall avoid the bird nesting period; March 1st to August 31st. This will ensure that no birds are directly lost from these procedures and that the impact upon breeding birds is minimised. In a situation where trees must be removed prior to the end of the nesting season, an assessment for nesting birds shall be carried out by an ecologist.

16.5.2 Operational phase

Birds

Planting for birds

Planting must provide suitable cover for nesting birds and encourage insect diversity that would sustain birds. This can be achieved both by availing of native species and non-native non-invasive plant species. Nesting birds require dense cover to hide nests and to avoid predation from cats, crow species etc. Planting should be examined by an ecologist and where supplementary planting is considered necessary; this should be incorporated.

The following measures are proposed to reduce impacts upon overwintering yellowhammers:

Provide important winter-feeding habitat by spraying and cultivating stubbles as late as possible. Where overwinter stubbles are not a viable option, create seed-rich wild bird cover crops (or wild bird seed mixtures). An annual crop established each spring with a high proportion of spring cereals (wheat, barley and/or triticale) in the seed mix will be best for yellowhammers and other buntings. Linseed or a brassica, such as rape or mustard, will broaden the benefits for finches and other seed-eating birds.

Create grass margins around arable fields to increase food and nesting habitat for yellowhammers. If you can maintain flower-rich margins, then this will be better for wildlife. Yellowhammers are more likely to use margins which have a short, thick hedge and an adjacent ditch.

Provide important winter-feeding habitat by spraying and cultivating stubbles as late as possible. Where overwinter stubbles are not a viable option, create seed-rich wild bird cover crops (or wild bird seed mixtures). An annual crop established each spring with a high proportion of spring cereals (wheat, barley and/or triticale) in the seed mix will be best for yellowhammers and other buntings. Linseed or a brassica, such as rape or mustard, will broaden the benefits for finches and other seed-eating birds.

Create grass margins to increase food and nesting habitat for yellowhammers. If you can maintain flower-rich margins, then this will be better for wildlife. Yellowhammers are more likely to use margins which have a short, thick hedge and an adjacent ditch.

Provide hedgerows of differing sizes around the farm. Yellowhammers favour hedgerows less than two metres tall.

All hedge, ditch and field margin management should be avoided between 1st March and 31st August because of nesting birds. Yellowhammers nest well into August, and later nests tend to be the most successful, so delaying cutting until at least 1st September is particularly important for them.

Trim hedgerows only once every two to three years. Avoid trimming all hedges in the same year.

Maintain a thick base to hedgerows. Management such as laying or coppicing can restore a dense structure at the base of a hedge.

Avoid laying or coppicing all hedges in the same year. Undertake management on a long rotation.

The landscape design for the proposed development shall incorporate the policies and objectives of the All-Ireland Pollinator Plan.

Bird boxes and wall access points for birds

Bird boxes shall be provided. These shall include boxes suitable for robins and blue tits. Vegetation will provide continued nest sites for other bird species.

Lighting

Lighting shall be for safety and mobility and not for ornamental purposes. Light falling upon any areas of benefit to birds such as hedgerow must not exceed 3 lux to ensure that resting and nesting species are not unnecessarily disrupted.

Motion-activated sensor lighting shall be employed where practicable. Such lighting shall have a short “activated time” to ensure that it is responding to human activity rather than bats, birds or passing foxes or badgers and to return to darkness quickly. Human presence would continue to re-trigger the lights while occasional bat or bird passage would be less likely to do so.

16.6 LAND AND SOILS

16.6.1 Construction Phase

Chapter 5: Land and Soils has been prepared by CS Consulting. An Outline Construction and Environmental Management Plan (CEMP) is included with the planning application prepared by Altemar, alongside an Outline Construction Management Plan (CMP) prepared by CS Consulting. These Plans should be read in tandem. A project specific Construction and Environmental Management Plan (CEMP) will be prepared and submitted to the planning authority for approval prior to the commencement of development.

It will be maintained and the procedures implemented by the contractor for the duration of the construction period. It will manage all polluting activities likely to occur on site and include emergency response plans for environmental incidents e.g. hydrocarbon spillages. All site personnel will be trained in the implementation of these procedures as part of the site induction process.

Mitigation measures for the site clearance phase will be as detailed in Chapter 11 of this EIAR and as outlined in the *Construction & Demolition Waste Management Plan* prepared by Awn Consulting and submitted as part of this planning application. Any spoil generated on site during site clearance and enabling works will be segregated and assessed to establish its suitability for reuse or recycling. Some waste material generated on site will not be suitable for reuse or recycling and therefore will be required to be removed from site and disposed of in accordance with current legislation. Waste material taken from site deemed to be inert or non-hazardous will be committed to a regional landfill.

Mitigation measures relating to impacts during construction as set out at Chapter 5.7.1 are set out below:

- The excavated material will be monitored and assessed to determine the most suitable disposal outlet. Material will be categorised according to the Landfill Directive and will be sent to appropriately licensed facilities for treatment/disposal. This will entail carrying out soil analysis to determine the appropriate waste facility for disposal. Where applicable, material on site will be segregated and divided into material re-use, material re-cycling and waste material streams in accordance with current guidelines and best practice.
- Dust suppression measures will be implemented to minimise dust generation during extended dry periods. Dust monitoring will be conducted through the excavation period. The provision of vehicle wheel wash facilities at site exits and implementation of a road sweeping programme will reduce effects on the surrounding road network.
- Inherent in any redevelopment is the potential for groundwater from the clearance/demolition and construction phases of the project to contribute to contamination of the local groundwater. By developing a detailed construction methodology and strict adherence to this policy by vigilant site management, these potential risks can be mitigated to acceptable levels.
- During the site clearance and excavation phases of the works, monitoring will be ongoing for noise, vibration, settlement, gas & water levels as well as ground contamination as described in the section below on Monitoring.
- Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development.
- At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas.
- Topsoil stockpiles will be protected for the duration of the works and not located in areas where sediment laden runoff may enter existing surface water drains.
- Topsoil stockpiles will also be located on site so as not to necessitate double handling.
- Topsoil will be re-used where possible within the subject site in suitable locations to reduce the requirement to take material off site.
- The design of road levels and finished floor levels has been carried out to minimize cut/fill type earthworks operations.
- Disturbed subsoil layers will be stabilized as soon as practicable. Therefore, backfilling of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping, will all be carried out promptly to minimise the duration that subsoil layers are exposed to the effects of weather.
- Similar to comments regarding stripped topsoil, stockpiles of excavated subsoil material will be protected for the duration of the works. Stockpiles of subsoil material will be located separately from topsoil stockpiles.
- Measures will be implemented to capture and treat sediment laden surface water runoff (e.g. sediment retention ponds, surface water inlet protection and earth bunding adjacent to open drainage ditches).

- Where feasible, excavated material will be reused as part of the site development works (e.g. for landscaping works and for backfill in trenches under non trafficked areas).
- No mitigation measures are required in relation to hedgerows as the impact is considered to be slight as the development layout has minimised impact on existing hedgerows.
- Earthworks plant and vehicles delivering construction materials to site will be confined to predetermined haul routes around the site.
- Construction site mitigation such as wheel wash and dust suppression measures will be implemented as part of the construction process and will be detailed in the appointed contractor's construction management plan.
- All oils, fuels, paints and other chemicals will be stored in a secure bunded hardstand area.
- Refuelling and servicing of construction machinery will take place in a designated hardstanding area, remote from surface water inlets (when it is not possible to carry out such activities off-site).
- It is unlikely that bedrock will be exposed during construction works. Deep drainage works will be avoided where possible to reduce the possibility of impacting on bedrock. Should bedrock be encountered, the extent of exposed bedrock will be limited to the immediate vicinity of active work areas. Where bedrock is encountered it will be crushed, screened and tested for use within the designed works to reduce the volume of material required to leave site. This will also reduce the volume of material to be imported to the site.
- The Outline CMP contains measures to ensure that accidental spillages will be appropriately dealt with, which includes a response procedure to deal with any accidental pollution events. Spillage kits shall be available and construction staff will be familiar with the emergency procedures and use of the equipment.

Table 2 of the outline CEMP includes mitigation measures to be implemented during construction:

- All in-stream works methodologies must have prior approval of Inland Fisheries Ireland.
- Best available technology (BAT) mitigation measures designed by project ecologist
- Staging of project to reduce risks to watercourses from contamination with all instream works being carried out in Phase 1 of the project, where the stream is diverted, landscaped and protected from all subsequent phases.
- Local watercourses (Rathgory Tributary stream) must be protected from dust, silt and surface water throughout the works.
- Local silt traps established throughout site.
- Mitigation measures on site include dust control, stockpiling away from watercourse and drains
- Stockpiling of loose materials will be kept to a minimum of 20m from watercourses and drains.
- Stockpiles and runoff areas following clearance will have suitable barriers to prevent runoff of fines into the drainage system and watercourses.
- Fuel, oil and chemical storage will be sited within a bunded area. The bund will be at least 50m away from drains, ditches or the watercourse, excavations and other locations where it may cause pollution.
- Bunds will be kept clean and spills within the bund area will be cleaned immediately to prevent groundwater contamination. Any water-filled excavations, including the attenuation tank during construction, that require pumping will not directly discharge to the stream. Prior to discharge of water from excavations adequate filtration will be provided to ensure no deterioration of water quality.
- The excavation of the diversion will be carried out in the dry with no connections to the existing watercourse, until the works are complete with the exception of the small areas where the stream is currently live.
- De-stocking of the Rathgory Tributary may need to be carried out prior to the commencement of works (if required by IFI) and upstream and downstream permeable barriers to remain in place until construction is completed.
- In stream works to be carried out in full consultation with and to the advice of Inland Fisheries Ireland and the project ecologist.
- Staging of project to initially stabilise, isolate, fence off watercourse on site
- Mitigation measures on site include dust control, stockpiling away from watercourses and drains
- Pollution control and mitigation on site
- Stockpiling of loose materials will be kept away from watercourses and drains. A risk based approach will be taken.
- Stockpiles and runoff areas following clearance will have suitable barriers to prevent runoff of fines into the drainage system and watercourses.
- Fuel, oil and chemical storage will be sited within a bunded area. A risk based approach will be taken.
- Bunds will be kept clean and spills within the bund area will be cleaned immediately to prevent groundwater contamination.

- During the construction works silt traps will be put in place in the vicinity of all runoff channels the stream to prevent sediment entering the watercourse.
- Petrochemical interception and bunds in refuelling area
- Planting in the vicinity of the stream crossings will be put in place as soon as possible to allow biodiversity corridors to establish.
- On-site inspections to be carried out by project ecologist.
- Maintenance of any drainage structures (e.g. de-silting operations) must not result in the release of contaminated water to the surface water network.
- No entry of solids to the associated stream or drainage network during the connection of pipework to the public water system
- Landscaping of the Riparian corridor will be carried out to the satisfaction of IFI.

In respect of the culvert installation, the following mitigation measures are set out by the CEMP:

Pre-Installation:

Prior to carrying out the works the project will:

- Submit a final methodology statement at least 1 month before the proposed in stream works to IFI.
- Notify IFI one week in advance of each culvert works commencing.
- Electrofish the water within the full extent of the works location to 50m downstream (if required by IFI), at the start of the project. Remove any fish and transport downstream (It would be preferable if this was carried out by IFI on the day of connection works if possible).

Installation process (live downstream culvert):

- A temporary stream diversion will be prepared with a 900mm diameter pipe.
- A minimum of four independent terram baffles will be placed downstream of the proposed works.
- The stream will be diverted through the pipe which will allow access to the bed of the original stream.
- The culvert will be installed in the dry while the river remains on its diverted course. The excavation will leave two areas of soil at either end of the diversion to prevent the river from entering the works area.
- Pumps will be placed within the diversion area should any seepage, rainwater or groundwater enter the works area. These are to be connected to silt busters/or to the onsite swales as directed by the project ecologist (and not directly back to the stream without filtering). Any seepage/rainwater/groundwater will be pumped onto open ground north of the river and allowed to seep naturally into the groundwater. No runoff will be allowed back into the stream.
- The excavated material will be stockpiled on site away from the watercourse (min 20m).
- Concrete units will be delivered to site on an Artic truck
- The new culvert sections will be lifted with the crane and placed on to the bed of Sand/stone as required.
- Minor adjustments if required will be made to ensure the first section is correct for line and level.
- The remaining sections will be installed using the same procedure.
- On completion of the installation backfilling will commence to the sides of the culvert.
- Backfill material will be placed and compacted in layers.
- New ducting sections will be placed downstream of the culvert.
- The ecologist will be in attendance for environmentally sensitive works.
- On completion of the backfilling the small remaining bunds trench will be removed.
- Silt interception methods will be implemented downstream prior to instream works.
- Instream biodiversity elements will be placed within the watercourse as instructed by the ecologist/IFI.
- A gradual switchover will be implemented and the stream will flow through the newly installed culvert under supervision of project ecologist.
- A gradual switch over to the diversion will be monitored by the project ecologist. This will involve the stream being gradually dammed both upstream and downstream of the crossing location using sandbags.
- Once the full flow is in the diversion and stable the Existing stream bed will then be gradually blocked off with sandbags and final elements of rock armour will be carried out behind sand bags.
- When complete downstream mitigation measures will be removed.

To construct the culverts at the mid and eastern end of the site these will be done in the dry and will not involve the diversion of the watercourse.

Human Health

The CEMP contains measures to ensure that accidental spillages will be appropriately dealt with, which includes a response procedure to deal with any accidental pollution events. Spill kits and hydrocarbon absorbent packs will be stored in the site compound area and operators will be fully trained in the use of this equipment.

Diesel pumps and similar equipment will be placed on drip trays to collect minor spillages or leaks. All equipment must be checked regularly. Fuel, oil and chemical storage will be sited within a bund of adequate capacity. The bund must be located at least 10 metres away from drains, ditches, excavations and other locations where it may cause pollution. All materials will be stored in accordance with the manufacturer's instructions.

Refer to the CEMP for full details of mitigation measures.

16.6.2 Operational Phase

During the operational phase it is anticipated that the development will create additional impermeable surface areas.

All new drainage on site will be pressure tested and have a CCTV survey carried out prior to being made operational. Source control measures such as swales, gully connections to tree pits and permeable paving will be used to provide initial treatment and interception of surface water. Further treatment will be provided in the open bottomed attenuation facilities and petrol interceptors before final discharge to the surface water outfalls.

Oil interceptors will be provided in order to prevent runoff of pollutants to the soils and sub soils. The use of interceptors will be in compliance with Pollution Prevention Guidelines (PPG) 3. No detergents will be discharged to interceptors as per current best practice.

All residential car park areas will have permeable paving. It will reduce surface runoff, trap suspended solids therefore filtering pollutants from stormwater which will improve water quality by filtering pollutants in the substrata layers.

16.7 WATER

16.7.1 Construction Phase

Chapter 6: Water has been prepared by CS Consulting. A project specific Construction Environmental Management Plan (CEMP) has been prepared by Altamar and is submitted with this application. This should be read alongside a Construction Management Plan prepared by CS Consulting.

The proposed development includes the realignment of Rathgory Tributary. The future diversion of and installation of the culverts in, the Rathgory Tributary will be carried out in the dry, prior to carrying out any instream works, in order to mitigate the silt disruption caused from the installation of the proposed culvert. The installation of culverts will take approx. 5-7 days. During the works period, a project ecologist/senior environmental advisor will be in attendance to monitor sensitive works (instream/connection works). Culvert installation will be carried out in the dry and the entire project. The Rathgory Tributary will be connected to its new course following the installation under the supervision of the project ecologist. IFI may require inspection of the culvert prior to the Rathgory Tributary becoming live in the new diversion and culvert.

Mitigation measures designed to protect the watercourse and downstream sensitive receptors are set out below:

- During the works silt traps will be put in place.
- No discharges will be to the watercourse during and post works.
- Silt traps established throughout site including a double silt fence between the site and the watercourse.
- Sufficient onsite cleaning of vehicles prior to leaving the site and on nearby roads, will be carried out, particularly during groundworks.
- The Site Manager will be responsible for the pollution prevention programme and will ensure that at least daily checks are carried out to ensure compliance. A record of these checks will be maintained.
- The site compound will include a dedicated bund for the storage of dangerous substances including fuels, oils etc. Refuelling of vehicles/machinery will only be carried out within the bunded area.
- A project ecologist must be appointed and be consulted in relation to all onsite drainage during construction works. Consultation with the project ecologist will not involve the formulation of new mitigation measures

for the purposes of protecting any European Site and relate only to the implementation of those mitigation measures already stated in the submission or the formulation of mitigation for other purposes.

- Dewatering of excavations may be necessary. Appropriate monitoring of groundwater levels during site works will be undertaken. Standard construction phase filtering of surface water for suspended solids will be carried out. Unfiltered surface water discharges or runoff are not permitted from the site into the Rathgory Tributary or Dee River during the works. Trenched double silt fencing shall be put in place along boundary of the proposed development site with 10m buffer from the Rathgory Tributary. This fencing must be in place as one of the first stages on site and prior to the full site clearance. The silt fencing will act as a temporary sediment control device to protect the watercourse from sediment and potential site water runoff but also act as a tree protection zone for the riparian buffer. The fencing will be inspected twice daily, based on site and weather conditions, for any signs of contamination or excessive silt deposits.
- Concrete trucks, cement mixers or drums/bins are only permitted to wash out in designated wash out area greater than 50m from sensitive receptors including drains and drainage ditches.
- Abstraction of water from watercourses is not to be permitted.
- Spill containment equipment shall be available for use in the event of an emergency. The spill containment equipment shall be replenished if used and shall be checked on a scheduled basis.
- All site personnel will be trained in the importance of good environmental practices including reporting to the site manager when pollution, or the potential for pollution, is suspected. All persons working on-site will receive work specific induction in relation to surface water management and run off controls. Daily environmental toolbox talks / briefing sessions will be conducted to outline the relevant environmental control measures and to identify any environment risk areas/works.
- Environmental risks due to construction and operation of the proposed development do potentially exist, particularly in relation runoff from sloping site, drains that could lead to the Rathgory Tributary.
- Ecological supervision will be required during diversion, excavation and enabling works stages. Silt interception measures will need to be in place to ensure that the watercourses are not impacted during works and in particular during the site clearance, in-stream works and reprofiling stages. Landscaping of the grassed areas of the site proximate to the Rathgory Tributary should take place immediately following re-profiling, to act as a buffer to protect the watercourse.
- Daily turbidity monitoring of the Rathgory Tributary (upstream, downstream of works) should take place during works in consultation with the project ecologist. This would be particularly important following high rainfall events. It is recommended that sufficient baseline readings are made prior to construction commencing to understand the existing turbidity on site particularly in the pond area as this appeared turbid during the site visit.

Mitigation measures relative to Air & Dust which may enter the Rathgory Tributary are noted as follows:

- Following the diversion works, maintain the existing 10m buffer with the Rathgory Tributary with a double layer of silt fences.
- Consultation will be carried with an ecologist throughout the construction phase.
- Trucks leaving the site with excavated material will be covered so as to avoid dust emissions along the haulage routes.
- Speed limits on site (15kmh) to reduce dust generation and mobilisation.
- The stream is to be protected from dust on site. This may require additional measures in the vicinity of the building during demolition e.g. placing of terram/protective material over the stream.
- Regular inspections of the site and boundary should be carried out to monitor dust, records and notes on these inspections should be logged.
- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
- Make the complaints log available to the local authority when asked.
- Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.
- Undertake daily on-site and off-site inspection, where receptors are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This will include regular dust soiling checks of surfaces within 100 m of site boundary, integrity of the silt control measures, with cleaning and / or repair to be provided if necessary.
- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.

- Fully enclose specific operations where there is a high potential for dust production and the site is active for an extensive period.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
- Cover, seed or fence stockpiles to prevent wind whipping.
- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic.
- Any road that has the potential to give rise to fugitive dust will be regularly watered, as appropriate, during dry and/or windy conditions.
- Maintain a vegetated strip and vehicle exclusion zone between the works and the Rathgory Tributary Stream in consultation with the project ecologist.
- 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.
- Avoid bonfires and burning of waste materials.
- 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.
- Due to the proximity of the Rathgory Tributary Stream an ecologist will oversee works in particular the excavation of material from the perimeter of the site.
- The Contractor will be required to consult with an ecologist prior to the beginning of works to identify any additional measures that may be appropriate and/or required.
- Materials, plant and equipment shall be stored in the proposed site compound location;
- Plant and equipment will not be parked within 50m of the Rathgory Tributary Stream at the end of the working day;
- Hazardous liquid materials or materials with potential to generate run-off shall not be stored within 50m of the Rathgory Tributary Stream.
- All oils, fuels and other hazardous liquid materials shall be clearly labelled and stored in an upright position in an enclosed bunded area within the proposed development site compound. The capacity of the bunded area shall conform with EPA Guidelines – hold 110% of the contents or 110% of the largest container whichever is greater;
- Fuel may be stored in the designated bunded area or in fuel bowzers located in the proposed compound location. Fuel bowzers shall be double skinned and equipped with certificates of conformity or integrity tested, in good condition and have no signs of leaks or spillages;
- Smaller quantities of fuel may be carried/stored in clearly labelled metal Jeri cans. Green for diesel and red for petrol and mixes. The Jeri cans shall be in good condition and have secure lockable lids. The Jeri cans shall be stored in a drip tray when not in use. They will not be stored within 50m of the Rathgory Tributary Stream;
- Drip trays will be turned upside down if not in use to prevent the collection of rainwater;
- Waters collected in drip trays must be assessed prior to discharge. If classified as contaminated, they shall be disposed by a permitted waste contractor in accordance with current waste management legal and regulatory requirements;
- Plant and equipment to be used during works, will be in good working order, fit for purpose, regularly serviced/maintained and have no evidence of leaks or drips;

- No plant used shall cause a public nuisance due to fumes, noise, and leakage or by causing an obstruction;
- Re-fuelling of machinery, plant or equipment will be carried out in the site compound as per the appointed Construction Contractor re-fuelling controls;
- The appointed Construction Contractor EERP will be implemented in the event of a material spillage;
- All persons working will receive work specific induction in relation to material storage arrangements and actions to be taken in the event of an accidental spillage. Daily environmental toolbox talks / briefing sessions will be conducted for all persons working to outline the relevant environmental control measures and to identify any environment risk areas/works.
- Consultation with Inland Fisheries Ireland will be carried out pre and post works is essential and to be led by the project ecologist.

The CEMP will be maintained and the procedures implemented by the contractor for the duration of the construction period. It will manage all polluting activities likely to occur on site and include emergency response plans for environmental incidents e.g. hydrocarbon spillages. Measures will be carried out to avoid environmental incidents, however if these occur then the following types must be reported to the responsible person in the construction team. All site personnel will be trained in the implementation of these procedures as part of the site induction process.

Standard construction and operational mitigation measures are proposed. These would ensure that water entering the Rathgory Tributary, is clean and uncontaminated. However, given the proximity of numerous sensitive receptors and the watercourse leading to the Natura 2000 sites, it should be noted that the early implementation of ecological supervision on site and consultation with IFI at initial mobilisation and enabling works is seen as an important element to the project, particularly in relation to the implementation of surface water runoff mitigation.

With the successful implementation of standard mitigation (set out at Table 2 of the submitted CEMP) measures to limit surface water impacts on the Rathgory Tributary, biodiversity mitigation/supervision and the successful installation and initiation of the foul treatment system, no significant impacts are foreseen from the construction or operation of the proposed project. Residual impacts of the proposed project will be localised to the immediate vicinity of the proposed works. Positive impacts would be seen through the implementation of an improved riparian corridor with greater potential for biodiversity than currently exists on site.

Mitigation measures to ensure compliance with Water Pollution Acts and prevent silt and pollution entering the stream will satisfactorily address the potential impacts on downstream biodiversity and Natura 2000 sites. No significant adverse impacts on the conservation objectives of Natura 2000 sites are likely following the implementation of the mitigation measures outlined above.

The CEMP should be read alongside the Construction Management Plan prepared by CS Consulting. Mitigation measures relating to impacts associated with the construction phase as set out at Chapter 6.8 of this EIAR are set out as follows:

- Prior to construction the Contractor will be required to develop an Environmental Management Plan which will incorporate mitigation measures such as containment procedures, audit and review schedules and an Emergency Response Plan in the event of spills, flooding or other incidents that may contribute to pollution to water during construction.
- All batching and mixing activities will be located in areas away from watercourses and drains.
- Protection measures will be put in place to ensure that all materials used during the construction phase are appropriately handled, stored and disposed of in accordance with recognised standards and manufacturer's guidance.
- Surface water drainage around the batching plant will be controlled and washout from mixing plant will be carried out in a designated, contained impermeable area.
- Spills of concrete, cement, grout or similar materials will not be hosed into drains.
- Rainwater that accumulates on site will be discharged to the LCC sewer system.
- The Contractor will comply with the following guidance documents:
 - CIRIA – Guideline Document C532 Control of Water Pollution from Construction Sites (CIRIA, 2001).

- Dewatering and surface water discharges on the site, during construction and prior to completion will be controlled. All necessary facilities will be incorporated such as settlement ponds/tanks, oil/grit interceptors with shut down valves, bunded oil storage tanks adjacent to a petrol interceptor for storage of any recovered oil. A monitoring programme including sampling for water quality before discharge to the Council sewer during construction will be carried out to ensure that only clean surface water is discharged to the receiving systems.
- The Contractor will make all necessary arrangements for a temporary water supply in agreement with Irish Water and/or Louth County Council, in addition temporary pumping of ground water to facilitate the proposed basement construction will be licenced by Louth County Council and the water levels monitored as outlined in the basement impact assessment.
- The recommendations set out in the *Biodiversity Chapter*, (Chapter 4 of this EIAR), have been considered with regard to potential construction impacts which would occur during the on-site development of the scheme. Notably potential impacts on sensitive receptors within the identified zone of influence and mitigation measures but forward to address same.

16.7.2 Operational Phase

Mitigation measures relative to the water environment as set out at Chapter 6.8 of the EIAR are noted as follows:

- Incidental surface run-off from underground basement car parks, compactor units and waste / service yard areas will be discharged into the foul drainage system. Grit / petrol / oil separators will be provided in all of the above areas to improve the quality of water discharging.
- The provision of flow control with storm-water attenuation will ensure the rate of discharge of surface water is limited to greenfield run-off rates of 2 litres/second/hectare with a total allowable surface water discharge of 2 litres/second in line with the recommendations of the Greater Dublin Regional Code of Practice for Drainage Works and the Greater Dublin Strategic Drainage Study.
- SuDS proposals will improve the quality and reduce the quantity of surface water discharging into the receiving system.
- Removal of the surface water from the existing combined sewers will reduce the hydraulic loading on the existing sewerage network and Regional Wastewater Treatment Plant.

Moderate negative impacts during the construction phase will be short term only in duration. Implementation of the above measures will mitigate any significant long-term adverse impact.

Human Health - Mitigation Measures

As noted in *Section 6.5.2* construction by its very nature contains the potential to affect the human health of the workers on site and the local population. To mitigation, as far as is possible, the potential risks a number of protocols will be implemented for the duration of the scheme.

- All proposed site operatives to be fully trained in their respective duties, to have completed the national 'Safe-pass' course and the bespoke site safety course for the site.
- The main Contractor for the development will ensure that only suitable qualified operatives shall be given the role and reasonability to operate equipment and machinery for which they are certified.
- The site will have Health & Safety protocols established, monitored and maintained by suitably qualified personnel on site to ensure the construction site is operated to the required standard.
- The storing and movement of materials will be in accordance with the suppliers and manufactures requirements.
- Excavations and waters courses will be suitably identified and cordoned off during the construction phase of the development.
- The Contractor will ensure reasonability for the maintenance and safe entry/egress of construction vehicles, including dust suppression & road sweeping.

- The site will have suitable 24/7 security to prevent acts of trespass onto the site during the construction period.

16.8 AIR QUALITY AND CLIMATE

Chapter 7: Air Quality & Climate has been prepared by AWN Consulting.

16.8.1 Construction Phase

Air Quality

In summary the measures which will be implemented will include:

- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic.
- Any road that has the potential to give rise to fugitive dust will be regularly watered, as appropriate, during dry and/or windy conditions.
- Vehicles exiting the site shall make use of a wheel wash facility where appropriate, prior to entering onto public roads.
- Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced site road, this will be 20 kph, and on hard surfaced roads as site management dictates.
- Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- During movement of materials both on and off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.

At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

Climate

Construction stage traffic and embodied energy of construction materials are expected to be the dominant source of greenhouse gas emissions as a result of the construction phase of the development. Construction vehicles, generators etc., may give rise to some CO₂ and N₂O emissions. However, due to short-term nature of these works, the impact on climate will not be significant.

Nevertheless, some site-specific mitigation measures will be implemented during the construction phase of the proposed development to ensure emissions are reduced further. In particular, the prevention of on-site or delivery vehicles from leaving engines idling, even over short periods. Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.

16.8.2 Operational Phase

The impact of the operational traffic associated with proposed development on air quality and climate is predicted to be imperceptible with respect to the operational phase in the long term. Therefore, no additional site specific mitigation measures are required.

Impacts to climate can occur as a result of electricity usage for heating and lighting from the proposed development. However, the proposed development has been designed to reduce the impact to climate as much as possible during the operational phase. The Energy Report prepared by MANDE Consulting Ltd. in support of this planning application outlines the measures to be implemented to reduce impacts to climate. The residential units will comply with the Part L (2019) building regulations and will be Nearly Zero Energy Buildings (NZEB) compliant. The residential units will achieve a minimum Building Energy Rating (BER) of A2 and the commercial units will have a minimum A3 rating.

The key design elements outlined in the Energy Report include:

- High-performance thermal envelope with low U-values for the fabric
- Airtight construction
- Ventilation system
- Heat Pump (HP) Technology or Highly efficient Gas boiler & Photo-Voltaic (PV) Panels
- Energy efficient lighting to be used throughout.

Full descriptions of the measures proposed and their benefits are outlined within the Energy Report submitted with this application.

16.9 NOISE AND VIBRATION

Chapter 8: Air Quality & Climate has been prepared by AWN Consulting.

16.9.1 Construction Phase

To ameliorate the likely noise impacts, a schedule of noise control measures has been formulated for the construction phase.

The main contractor will be required to follow and implement where required appropriate mitigation measures to minimise significant impacts at receptor locations. 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).
- 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.

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.

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 considered. Items suitable for enclosure include pumps and generators.

BS5228 makes several 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:

- 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 10 dB. Mobile plant should be switched off when not in use and not left idling.
- For percussive tools such as pneumatic concrete breakers several 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 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 the 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.

Screening

Screening is typically 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 construction 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 proximity to the nearest sensitive perimeter buildings

It is noted that the main contractor shall secure the site with barriers and hoarding in accordance with the final Detailed Construction Management Plan. Solid hoarding shall be used to provide noise screening where possible, when significant constructions works are expected to occur in proximity to noise sensitive locations.

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 any anticipated noisy

construction activity, the liaison officer should inform the nearest noise sensitive locations of the time and expected duration of the works.

Monitoring

During the construction phase consideration may be given to noise and vibration monitoring at the nearest sensitive locations, where high level of noise and or vibration are expected.

Noise monitoring should be conducted in accordance with the International Standard ISO 1996: 2017: *Acoustics – Description, measurement and assessment of environmental noise* and be located a distance of greater than 3.5m away from any reflective surfaces, e.g. walls, in order to ensure a free-field measurement without any influence from reflected noise sources.

Noise monitoring will be established on site throughout the duration of the project. Noise monitoring shall be carried out for a period of at least 2 weeks prior to any works commencing, to establish current baseline noise levels. The results of the baseline noise survey shall be communicated to Louth County Council in the form of a technical report.

16.9.2 Operational Phase Noise Mitigation

During the operational phase of the development, the impact assessment has found that there are no significant noise impacts likely at nearby noise sensitive locations. Therefore, noise mitigation measures with respect to the outward impacts from the development are not deemed necessary.

16.10 LANDSCAPE AND VISUAL

Chapter 9: Landscape & Visual has been prepared by Stephen Diamond Associates.

16.10.1 Construction Phase

The mitigation measures applied to the development scheme have been designed as an integral part of the project design.

- The remedial measures proposed revolve around the implementation of appropriate site management procedures – such as the control of site lighting, storage of materials, placement of compounds, delivery of materials, car parking, etc. Visual impact during the construction phase will be mitigated somewhat through appropriate site management measures and work practices to ensure the site is kept tidy, dust is kept to a minimum, and that public areas are kept free from building material and site rubbish.
- Site hoarding will be appropriately scaled, finished and maintained for the period of construction of each section of the works as appropriate. To reduce the potential negative impacts during the construction phase, good site management and housekeeping practices will be adhered to. The visual impact of the site compound and scaffolding visible during the construction phase are of a temporary nature only and therefore require no remedial action.
- A number of existing trees and hedgerows are to be retained and these are shown in the Arboricultural Report and associated drawings prepared by Charles McCorkell. Existing trees to be retained are particularly sensitive to negative impacts during the construction phase if proper protection measures are not adhered to. With regard to the protection of the retained trees on site during proposed construction works, reference should be made to BS5837: Trees in relation Design, Demolition and Construction – Recommendations (BSI, 2012). Tree protection details (from Charles McCorkell Arborist) are included with the application.

16.10.2 Operational Phase

Mitigation measures are employed to provide a coherent sense of place, or *genus loci*, by providing a clear and legible design for the parts of the proposal, inspired by the site setting and characteristics.

- The visibility of the proposed development will be mitigated to varying degrees by screen planting of native trees and hedgerows to the site boundaries, entrance and car-parking areas. In time the maturity of this planting will act to visually absorb and soften the built environment and will become an asset in itself. The planting will also act to reduce air and noise pollution.

- Predominantly native tree planting has been used, this will increase biodiversity and provide green corridors along which wildlife can move between habitats, the development therefore becomes a vital link in the green infrastructure of the town.
- The landscape design is specified to provide for a low maintenance regime by the selection of progressive naturalistic systems and native/naturalised species.
- Many of the trees specified as part of the landscape plan will be planted as semi-matures, ensuring that a strong degree of shelter, maturity and an increased feeling of permanence can be established quickly. The species have been specifically selected to provide seasonal interest and variety through their shape, flower and form.
- Trees and shrubs will also be used in conjunction with the hard landscape to create interesting, enticing and attractive spaces for the public to visit. The strategic placement of elements such as seating, paths and attractive planting schemes will ensure an enjoyable pedestrian experience.

Native naturalised and ornamental tree, shrub and hedgerow species have been specified both around the perimeter and within the external spaces of the project facilities. This performs a screening function which will help to settle the development within the receiving environment.

- A lower, attractive planting of ornamental flowering shrubs and perennials will be provided. This in tandem with native tree and hedgerow species will provide food sources and habitats for wildlife, be they mammals, birds or invertebrates.
- The specification of planting as described contributes to the expansion of green infrastructure within the town, which is a stated aim of green infrastructure policy in Louth County Development Plan 2021-2027. The development would also assist in the realisation of enhancing the general level of tree cover in the town which is also mentioned in the document & to also reduce the impact of new structures on the existing town.

The proposed planting will generally be established in line with normal landscape planting techniques, i.e., *'bare-root transplants'*, *'whips'*, *'feathered trees'*, root-balled *'semi-mature standard trees'* and container grown *'ornamental shrubs'*. The proposed planting will be subject to an agreed maintenance and management plan. Please refer to the *'Landscape Plan + Planting Schedule'* drawings no. 20-547-SDA-PD-DR-001 submitted by Stephen Diamond Associates for full landscape details.

The implementation of the public park, linear park & riparian corridor and other various open spaces through the site will enhance the landscape the visual qualities of the overall landscape.

The Hill Park will also provide a valuable public amenity to the settlement and local community.

16.11 MATERIAL ASSETS – TRAFFIC

Chapter 10: Traffic has been prepared by CS Consulting.

16.11.1 Construction Phase

As described in the accompanying Outline Construction Management Plan (OCMP) report, the lead contractor appointed for the construction of the development will be required to prepare a detailed project-specific Traffic Management Plan and agree this with Louth County Council and An Garda Síochána prior to works commencing on site. The project Specific Traffic Management Plan will include the mitigation contained in this EIAR. This plan will be updated as required throughout the project. Issues addressed in the Traffic Management Plan will include:

- Public safety
- Construction traffic routes
- Deliveries schedule
- Special deliveries (wide and long loads)
- Traffic flows
- Signage and lighting
- Road opening requirements
- Road closures
- Lighting

Construction traffic, and in particular large deliveries, shall be coordinated to ensure that movements during the background peak hours are avoided as much as possible. Construction-related vehicle movements will be minimised through:

- consolidation of delivery loads to/from the site and scheduling of large deliveries to occur outside of peak periods;
- use of precast/prefabricated materials where possible;
- reuse of 'cut' material generated by the construction works on site where possible, through various accommodation works;
- provision of adequate storage space on site;
- development of a strategy to minimise construction material quantities as much as possible;
- promotion of public transport use by construction personnel, in order to minimise staff vehicle movements.

A liaison officer will be appointed as a point of contact with local residents, Louth County Council, and An Garda Síochána.

16.11.2 Operational Phase

The development shall incorporate several design elements intended to mitigate the impact of the development on the surrounding road network during its operational phase. These include:

- pedestrian and cyclist permeability between the N2 Drogheda Road to the west (via the adjacent permitted Bridgeway development) and Hale Street to the north;
- an appropriate car parking provision, which shall discourage higher vehicle ownership rates and excessive vehicular trips to the development (by residents and visitors);
- a high provision of secure bicycle parking, which shall serve to encourage bicycle journeys by both development occupants and visitors; and
- the provision of a new bus stop on Bridgeway Avenue, within 400m of all dwellings within the site, which will facilitate the future provision of a local bus service through the subject development.

16.12 MATERIAL ASSETS – WASTE MANAGEMENT

Chapter 11: Waste Management has been prepared by AWN Consulting.

16.12.1 Construction Phase

A Construction & Demolition Waste Management Plan prepared by AWN Consulting has been prepared in line with the requirements of the 'Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects' document issued by the DoEHLG and is included with the application (Appendix 11.1).

The mitigation measures outlined in the C&D WMP will be implemented in full and form part of mitigation strategy for the site. The mitigation measures presented in this C&D WMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the excavation and construction phases of the proposed development. Prior to commencement of site works the contractor(s) will be required to refine/update the C&D WMP or submit an addendum to C&D WMP to LCC to detail specific measures to minimise waste generation and resource consumption and provide details of the proposed waste contractors and destinations of each waste stream.

The project engineers have estimated that c. 42,096m³ of material will be generated from the excavations required to facilitate the construction of the basement, building foundations and the installation of underground services. It is anticipated that this material will require removal from site for offsite reuse, recovery, recycling and/or disposal. The contractor(s) will endeavor to ensure that material is reused or recovered off-site insofar as is reasonably practicable or disposed of at authorized facility.

In addition, the following mitigation measures will be implemented:

- Building materials will be chosen with an aim to 'design out waste';

- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery – it is anticipated that the following waste types, at a minimum, will be segregated:
 - Concrete rubble (including ceramics, tiles and bricks);
 - Plasterboard;
 - Metals;
 - Glass; and
 - Timber.
- Left over materials (e.g. timber off-cuts, broken concrete blocks/bricks) and any suitable construction materials shall be re-used on-site, where possible;
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
- A waste manager will be appointed by the main contractor(s) to ensure effective management of waste during the excavation and construction works;
- All construction staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered where possible to avoid material designated for disposal;
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

Nearby sites requiring clean fill material will be contacted to investigate reuse opportunities for clean and inert material, if required. If any of the material is to be reused on another site as by-product (and not as a waste), this will be done in accordance with Article 27 of the *EC (Waste Directive) Regulations (2011)*. EPA approval will be obtained prior to moving material as a by-product. However, it is not currently anticipated that article 27 will be utilised to move waste off-site.

These mitigation measures will ensure that the waste arising from the construction phase of the development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations, the Litter Pollution Act 1997, the EMR Waste Management Plan (2015 - 2021) and the LCC *Waste Bye-Laws, 2019*. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will encourage sustainable consumption of resources.

16.12.2 Operational Phase

As previously stated, a project specific OWMP has been prepared and is included as Appendix 11.2, The mitigation measures outlined in the OWMP will be implemented in full and form part of mitigation strategy for the site. Implementation of this OWMP will ensure a high level of recycling, reuse and recovery at the development. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the targets set out in the EMR Waste Management Plan 2015 – 2021 and the LCC waste bye-laws.

In addition, the following mitigation measures will be implemented:

- On-site segregation of all waste materials into appropriate categories including (but not limited to):
 - Organic waste;
 - Dry Mixed Recyclables;
 - Mixed Non-Recyclable Waste;
 - Glass;
 - Waste electrical and electronic equipment (WEEE);
 - Batteries (non-hazardous and hazardous);
 - Cooking oil;
 - Light bulbs;
 - Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.);
 - Furniture (and from time to time other bulky waste); and

- Abandoned bicycles.
- All waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials;
- All waste collected from the development will be reused, recycled or recovered where possible, with the exception of those waste streams where appropriate facilities are currently not available; and
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.

These mitigation measures will ensure the waste arising from the development is dealt with in compliance with the provisions of the *Waste Management Act 1996*, as amended, associated Regulations, the *Litter Pollution Act 1997*, the *EMR Waste Management Plan (2015 - 2021)* and the LCC waste bye-laws. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

16.13 MATERIAL ASSETS – UTILITIES

Chapter 12: Utilities has been prepared by AWN Consulting.

16.13.1 Construction Phase

Construction of the proposed development will require connections to water supply and drainage infrastructure, power, telecommunications and to the existing road network. There will also be a requirement to upgrade connections to the IW network outside the permitted and proposed site to the west of the site following an agreement with IW.

Ongoing consultation with LCC, Irish Water, Eirgrid, ESB and other relevant service providers within the locality and compliance with any requirements or guidelines they may have will ensure a smooth construction schedule without disruption to local and business community.

Power and Electricity Supply

The power demand for the construction phase will be relatively minor and the connection works are entirely within permitted and proposed site boundaries, so it is not anticipated that this would have any potential offsite impact.

The excavation of trenches within the vicinity of existing electrical services will be carried out in consultation with ESB Networks to ensure there is no impact on existing users.

Once the construction of the unit substations is completed, ESB Networks will be mobilised to complete the commissioning in accordance with the ESB Network requirements. There are no likely significant effects as a result of commissioning.

Telecommunications

The telecommunications will be extended from the permitted development to accommodate the proposed development. As these works are entirely within permitted and proposed site boundaries, it not anticipated that this would have any potential offsite impact.

Strict quality control measures will be undertaken while laying telecommunications cables.

Surface Water Infrastructure

Run-off water containing silt will be contained on site (using a silt trap and oil inceptor) to ensure adequate silt removal. The works contractor will be obliged to put best practice measures in place to ensure that there are no interruptions to service in existing surface water sewers. It is not anticipated that there will be any interruptions to service in existing surface water sewers, but should interruptions be anticipated, they will be agreed in advance.

Strict quality control measures will be undertaken while laying pipes to minimise or eradicate infiltration (where existing water in the ground enters the surface water infrastructure) and ex-filtration (where water in the surface water infrastructure escapes into the ground).

Foul Drainage Infrastructure

Portable toilets will be provided for construction staff.

Prior to temporary connection of the foul drainage to the public network, approval will be given to ensure there is enough capacity in the public network for the proposed development's foul water discharge. It is then not anticipated that this would have any offsite impact.

The works contractor will be obliged to put a number of measures in place to ensure that there is no impact on the public network during the construction works. Foul drainage for the proposed development will be in accordance with the Building Regulations Technical Guidance Document H for design and construction.

Strict quality control measures will be undertaken while laying pipes to minimise or eradicate infiltration and ex-filtration.

Water Supply

A temporary connection will be put in place for the construction phase. As the connection works are approved to ensure there is capacity within the public watermain, it is not anticipated that this would have any potential offsite impact.

The works contractor will be obliged to put best practice measures in place to ensure that there are no interruptions to service from the public watermain. It is not anticipated that there will be any interruptions to service from the public watermain, but should interruptions be anticipated, they will be agreed in advance.

Strict quality control measures will be undertaken while laying pipes to minimise or eradicate infiltration and ex-filtration.

16.13.2 Operational Phase

Power and Electricity Supply

As detailed in Section 12.5.2, the power supply for the proposed development will be provided via an extension of the existing power supply infrastructure currently in place and under construction for the permitted residential development to the west of the site. Two new ESB sub stations are required to cater for the electrical requirement of the residential development, the substations have been designed into the proposed residential scheme. A formal application to confirm the nature of the ESB supply is made once the formal address of the residential development is agreed with LCC.

As per the *Building Energy Report* prepared by MANDE Consulting Engineers, which has been submitted with the documents for the planning application, the proposed development will be constructed to the high building standards and will provide a sustainable, energy efficient development for future occupants.

Telecommunications

There is sufficient capacity available in the area network for the proposed development. Therefore, no remedial or mitigation measures are required in relation to telecommunications.

Surface Water Infrastructure

The surface water drainage system for the proposed development incorporates runoff control in the form of attenuation, which will restrict discharge from the development to the allowable greenfield runoff rate of 2.07l/s/ha. The attenuation storage is provided via 4 no. Stormtech attenuation systems. These Sustainable Drainage Systems (SuDS) measures will prevent increase in surface water flow offsite. The allowable greenfield runoff rate has been established by the project engineers, CS Consulting, using the methodology set out in the *Engineering Services Report*.

Foul Drainage Infrastructure

As discussed in Section 12.5.2 above, IW have provided a CoF for the wastewater requirements for the development (which are detailed in the *Engineering Services Report* prepared by CS Consulting, which accompanies the planning application) can be accommodated, subject to application.

Foul drainage for the proposed development will be in accordance with the relevant standards for design and construction, including the Irish Water Code of Practice for Wastewater Infrastructure, The Building Regulations Technical Guidance Document (TGD) 'Part H' & the Regional Code of Practice for Drainage Works. A Statement of Design Acceptance has also been received from IW.

No remedial or mitigation measures are required in relation to foul drainage infrastructure.

Water Supply

As discussed in Section 12.5.2 above, IW have provided a CoF for the water requirements for the development (which are detailed in the *Engineering Services Report* prepared by CS Consulting, which accompanies the planning application) can be accommodated, subject to application. No remedial or mitigation measures are required in relation to water supply.

16.14 ARCHAEOLOGY, ARCHITECTURE AND CULTURAL HERITAGE

Chapter 13: Archaeology, Architecture & Cultural Heritage has been prepared by Archaeological Consultancy Services Units Ltd.

16.14.1 Construction Phase

In order to mitigate the potential impact of the proposed development on potential archaeological remains and the townland boundary, the following measures shall be adhered to:

- An additional geophysical survey shall be carried out within the north field of the proposed development. Due to significant quantities of soil having been introduced to the site, and historic quarrying, further geophysical survey within the south field is not recommended.
- This shall be followed by an intensive testing programme of the entire site, targeting anomalies identified and is required prior to any works in order to mitigate any potential impact on possible archaeology. It should be carried out by a licence eligible archaeologist in consultation with and under licence from the National Monuments Service of the Department of Housing, Local Government and Heritage.
- Wherever possible, the preservation in situ of any identified archaeological remains is the preferable option, however, where this is not possible, preservation by record in advance of construction is recommended. Should any archaeological remains be uncovered during test trenching, the appointed archaeologist shall consult with the Licensing Section of the NMS, and methodologies shall be agreed regarding their resolution/avoidance.
- Full provisions should be made for the resolution (full excavation) of any archaeological features/deposits that may be discovered in the course of the assessment, should that be deemed the most appropriate course of action.
- Adequate time and resources will be provided by the developer for the resolution of any archaeology identified within the development site, which will be directly impacted by groundworks. Time and resources will also be allowed for any post-excavation work and specialist analysis necessary following any archaeological excavation that takes place.
- A report shall be compiled on completion of the archaeological excavation and submitted to the relevant authorities.
- The townland boundary that traverses the proposed development shall be recorded by photograph and written description prior to any development proceeding.

16.14.2 Operational Phase

No mitigation measures relating to the archaeological, architectural and cultural heritage resource are deemed to be necessary during the operational phase of the proposed development.

16.15 RISK MANAGEMENT

Chapter 14: Risk Management has been prepared by Arkmount Construction Ltd.

16.15.1 Construction Phase

The Construction Management Plan and the Construction & Environmental Plan as well as good housekeeping practices will include the mitigation measures outlined below and which will limit the risk of accidents during construction. Fire safety will be dealt with under the Fire Safety Code at design and construction stage. The main contractor will have responsibility for fire safety during operations. In relation to falls these have been dealt with during design.

The proposed development will involve the ground works to facilitate the proposed development. Site investigations have been carried out and have not identified any hazardous material. Further testing will be carried out prior to construction to inform the detailed design. In the event that any hazardous material is identified the appropriate measures will be taken in accordance with the requirements of the EPA. The excavation and movement of soil from the site will be undertaken by a registered specialist contractor and removed to a licenced facility.

The following mitigation will be implemented, where relevant:

- Hazardous materials used during construction will be appropriately stored so as not to give rise to a risk of pollution.
- In the event of storms or snow, construction activity can be halted and the site secured. The construction activity will involve a number of potential risks, as set out below. The risks identified include traffic management, and fire strategy.
- 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 proposed works will take place away from the public road in a controlled environment, the objective of which is to minimise the short term disruption to local residents and reduce the potential for accidents.
- 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 natural disasters (e.g. flooding), the proposed development has undergone a Site Specific Flood Risk Assessment, prepared by JBA Consultants. The main area of the site where development is proposed is not at risk of fluvial, pluvial or groundwater flooding. A small part of the site is located within Flood Zone B, with this area maintained as landscaped open space in the proposed development.
- A Health and Safety Plan will be prepared (required by the *Safety, Health and Welfare at Work (Construction) Regulations 2013*) to address health and safety issues from the design stages through to the completion of the construction and maintenance phases. The Health and Safety Plan will comply with the requirements of the Regulations and will be reviewed as the development progresses.
- Safety on site will be of paramount importance. Only contractors with the highest safety standards will be selected and will include assessment of their safety performance over the previous 3 years including notifiable and reportable accidents to the Health and Safety Authority (HSA). During the selection of the relevant contractor and the respective subcontractors their safety records will be investigated further at both pre-tender stage and at pre-award meetings with the EHS department.
- Prior to working on site, each individual will receive a full safety briefing and will be provided with all of the safety equipment relevant to the tasks the individual will be required to perform during employment on site.
- Safety briefings will be held regularly and prior to any onerous or special task. 'Toolbox talks' will be held regularly to ensure all workers are fully aware of the tasks to be undertaken and the parameters required to ensure the task will be successfully and safely completed.
- All visitors will be required to wear appropriate personal protective equipment prior to going on to the site and will undergo a safety briefing by a member of the site safety team.
- Regular site safety audits will be carried out throughout the construction programme to ensure that the rules and regulations established for the site are complied with at all times.

17.0 REFERENCE LIST

INTRODUCTION AND METHODOLOGY

- Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, EPA, August 2017
- 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).
- Guidelines on Information to be Contained in an Environmental Impact Statement (EPA 2002).
- European Union (Planning and Development) (Environmental Impact Assessment) Regulation 2018
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report, European Commission, 2017
- EU Guidance on EIA Screening (DG Environment 2001).
- Guidance on EIA Scoping (DG Environment 2001).
- EIA Review Checklist (DG Environment 2001).
- Study on the Assessment of Indirect & Cumulative Impacts as well as Impact Interaction (DG Environment 2002).

POPULATION AND HUMAN HEALTH

- National Planning Framework 2018: <https://npf.ie/>
- Regional Spatial and Economic Strategy for the EMRA, 2018: <https://emra.ie/final-rses/>
- Louth County Development Plan 2021-2027: <https://www.louthcoco.ie/en/publications/development-plans/louth-county-council-development-plans/>
- 2021 Labour Force Survey Q4: www.cso.ie
- ESRI Quarterly Economic Commentary, Winter 2021: <https://www.esri.ie/publications/quarterly-economic-commentary-winter-2021>
- Population Change and Housing Demand in Ireland (Central Bank of Ireland): <https://www.centralbank.ie/news-media/press-releases/press-release-economic-letter-population-change-and-housing-demand-in-ireland-10-december-2019>
- Central Statistics Office: www.cso.ie
- Pobal: www.Pobal.ie
- Health and Safety Authority – www.hsa.ie

BIODIVERSITY

- Department of Environment Heritage and Local Government Circular NPW 1/10 and PSSP 2/10 on Appropriate Assessment under Article 6 of the Habitats Directive – Guidance for Planning Authorities March 2010.
- Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities, Department of the Environment, Heritage and Local Government 2009; http://www.npws.ie/publications/archive/NPWS_2009_AA_Guidance.pdf

- Managing NATURA 2000 Sites: the provisions of Article 6 of the Habitats Directive 92/43/EEC, European Commission 2000; http://ec.europa.eu/environment/nature/Natura2000/management/docs/art6/provision_of_art6_en.pdf
- 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; http://ec.europa.eu/environment/nature/Natura2000management/docs/art6/Natura_2000_assess_en.pdf
- Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission; http://ec.europa.eu/environment/nature/Natura2000/management/docs/art6/guidance_art6_4_en.pdf
- Guidance document on the implementation of the birds and habitats directive in estuaries and coastal zones with particular attention to port development and dredging; http://ec.europa.eu/environment/nature/Natura2000/management/docs/guidance_doc.pdf
- The Status of EU Protected Habitats and Species in Ireland. http://www.npws.ie/publications/euconservationstatus/NPWS_2007_Conservation_Status_Report.pdf
- NPWS (2011) Conservation Objectives: Dundalk Bay SAC 000455 and Dundalk Bay SPA 004026. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- NPWS (2021) Conservation objectives for River Boyne and River Blackwater SAC [002299]. Generic Version 1. Department of Housing, Local Government and Heritage.
- NPWS (2022) Conservation objectives for Stabannan-Braganstown SPA [004091]. Generic Version 9.0. Department of Housing, Local Government and Heritage.
- Fossitt, J.A. (2000), A Guide to Habitats in Ireland, The Heritage Council
- Institute of Environmental Assessment, 1995. Guidelines for Baseline Ecological Assessment
- CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland.

LAND AND SOILS

- Guidelines on the information to be contained in Environmental Impact Statements (EPA 2002 & 2017 'Draft'),
- Advice Notes on Current Practice (in the preparation of Environmental Impact Statements) (EPA 2015),
- EIA Directive 2014/EU/52, Advice Notes on Current Practice (in preparation of Environmental Impact Statements) (EPA 2003),
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment, (Dept Housing 2018).
- National Roads Authority (NRA) Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.
- Ground Investigations Ireland (GII): Subsoil Assessment Report No. 10716-06-21 (2021)
- Louth County Council (LCC): Louth County Development Plan 2021–2027 (2021)

WATER

- Louth County Council Development Plan 2021–2027;
- Louth County Council Flood Risk Assessment, 2021 – 2027;
- Regional Code of Practice For development works, Version 6;
- Irish Water Code of Practice for Water Infrastructure;
- Irish Water Code of Practice for Wastewater Infrastructure;
- Greater Dublin Strategic Drainage Study;
- Office of Public Works Flood Maps;
- Department of the Environment Flooding Guidelines;
- Geological Survey of Ireland Maps;
- Local Authority/Irish Water Drainage Records.

AIR QUALITY AND CLIMATE

- BRE (2003) Controlling Particles, Vapours & Noise Pollution From Construction Sites Department of the Environment, Heritage and Local Government (2004) Quarries and Ancillary Activities, Guidelines for Planning Authorities
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- European Commission (2013) *Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment*
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- Environmental Protection Agency (2019) GHG Emissions Projections Report - Ireland's Greenhouse Gas Emissions Projections 2018 - 2040
- Environmental Protection Agency (2020a) Air Quality Monitoring Report 2019 (& previous annual reports)
- Environmental Protection Agency (2020b) Ireland's Provisional Greenhouse Gas Emissions 1990 – 2019
- Environmental Protection Agency (2021) EPA website Available at: <http://www.epa.ie/whatwedo/monitoring/air/>
- German VDI (2002) Technical Guidelines on Air Quality Control – TA Luft
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